European Commission

Education and Training Monitor 2020

Country analysis

Education and Training

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Education and Training Monitor 2020

Country analysis

2020 Directorate-General for Education, Youth, Sport and Culture EN

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Additional contextual data can be found at ec.europa.eu/education/monitor

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Introduction

Volume 2 of the Education and Training Monitor 2020 includes 27 individual country reports. It builds on the most up-to-date quantitative and qualitative evidence to present and assess the main recent and ongoing policy measures in each EU Member State. It therefore complements other sources of information which offer descriptions of national education and training systems.

Section 1 presents a statistical overview of the main education and training indicators. Section 2 briefly identifies the main strengths and challenges of the country's education and training system. Section 3 focuses on digital education. Section 4 looks at investment in education and training. Section 5 deals with policies to modernise early childhood and school education. Section 6 covers vocational education and training. Finally, Section 7 discusses measures to modernise higher education, while Section 8 covers adult learning.

AUSTRIA

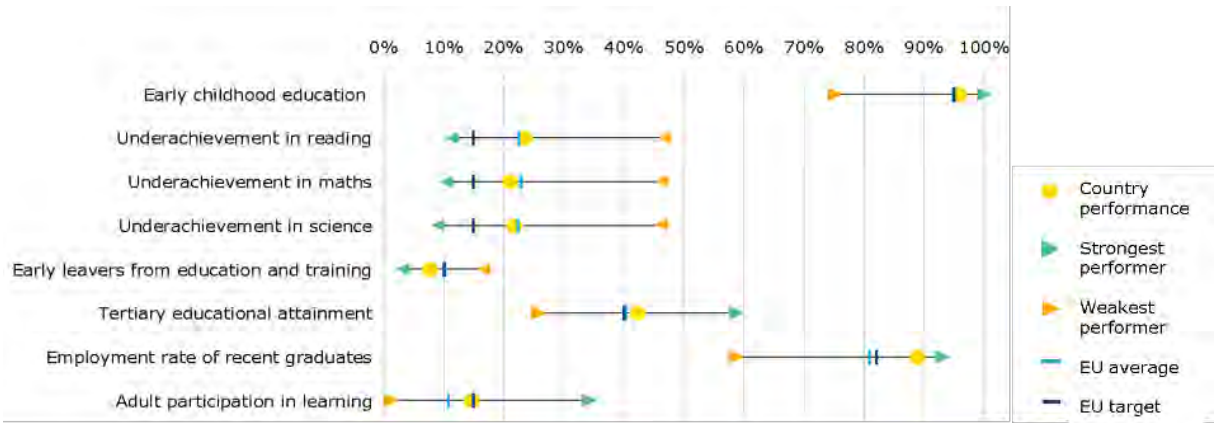
1. Key indicators

Figure 1 – Key indicators overview

			Austria		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			8.8%	7.8%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			23.4%	42.4%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			91.3%	96.0% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		27.6%	23.6% [18]	19.3%	22.5% [18]
	Maths		23.3%	21.1% [18]	22.2%	22.9% [18]
	Science		20.9%	21.9% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		87.9%	89.0%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		13.9%	14.7%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	5.8% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	9.1% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		5.1%	4.8% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€8 990 [12]	€10 278 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€10 405 [12]	€11 070 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€12 448 [12]	€13 293 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		6.4%	5.7%	12.6%	8.9%
	Foreign-born		22.0%	19.2%	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		23.2%	43.5%	32.0%	41.3%
	Foreign-born		24.1%	40.0%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		87.1%	86.3%	72.2%	75.9%
	ISCED 5-8		90.1%	91.4%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs; : = not available; 12 = 2012; 16 = 2016; 17 = 2017; 18 = 2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Austria is reviewing its education policies including previous reforms.
- Schools and higher education institutions successfully managed the COVID-19 crisis but have to avoid a widening education gap between pupils from wealthier backgrounds and those from disadvantaged or migrant backgrounds.
- Improving digital skills at all levels of education and strengthening capacity for blended learning have been top priorities since the COVID-19 crisis for government and stakeholders.
- Participation in early childhood education and care has increased, but more focus on the quality of provision is required.

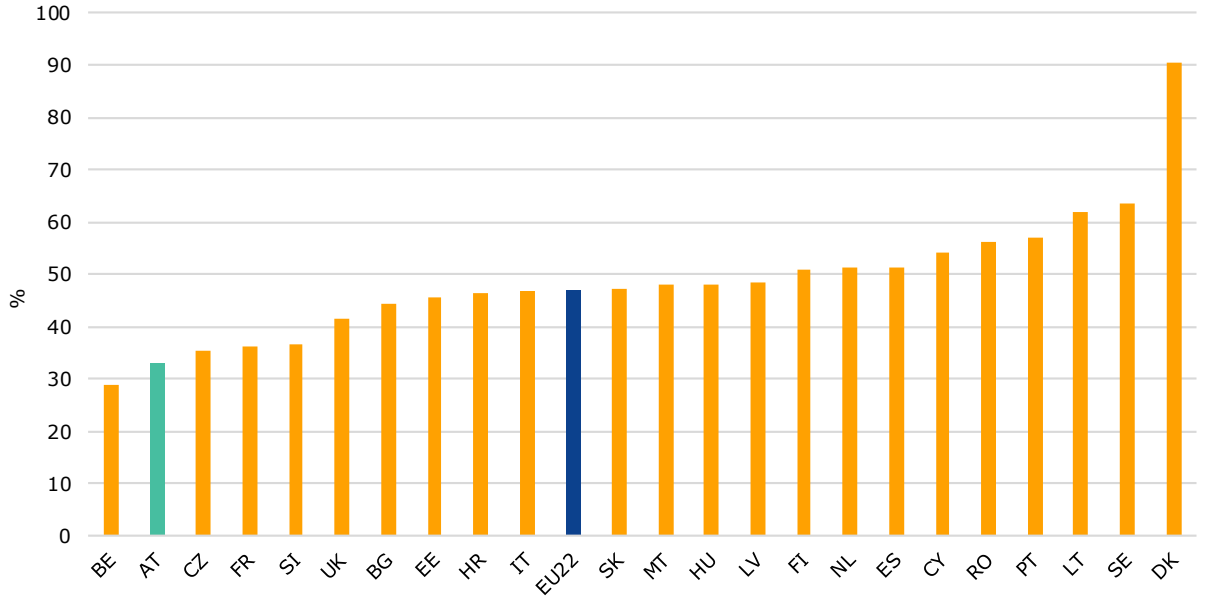
3. A focus on digital education

Not all Austrian students have information and communications technology (ICT) devices (laptops or tablet computers) and access to equipment in school varies by school type. In 2018, Austrian secondary schools were better digitally equipped and connected than the EU average at both ISCED 2 and ISCED 3 levels. At ISCED 2 level, 72% of schools were digitally well equipped and connected (EU average: 52%) and at ISCED 3 level, 86% of schools were digitally well equipped and connected (EU average: 72%). However, fewer primary schools are similarly well equipped: only 11% of primary schools are well equipped and connected, (EU average: 35%) (European Commission 2019a). The share of schools giving ICT classes with student-owned devices is 5.9% at non-academic lower secondary level, 6.4% at academic lower secondary, and 14.6% at secondary level in general. Working with equipment owned by students allows two thirds of secondary classes to work with ICT (Masterplan Digitalisation). Depending on the type of school, about half of secondary schools have Wi-Fi in all classes, but only about a third have high-speed access at more than 100 Mbit/s.

The amount of e-learning varies considerably by education level and school type. Computer usage in school increases with education level: 43% of students at ISCED 2 use their computer at school at least once a week for learning purposes (EU average: 37%), compared to 65% at ISCED 3 (EU average: 56%). In 2016, 90% of federal schools (mainly upper secondary schools) engaged in e-learning, compared to 42% of lower secondary compulsory schools, and only 25% of primary schools (Breit, 2018). In secondary school, depending on the type, about one third up to half lack pedagogical programmes to use ICT in class (Federal Ministry of Education, Science and Research (2020b). Austrian teachers are generally less self-confident about their digital skills than their EU counterparts, in particular at ISCED levels 1 and 3. However, they are more confident than the EU average at ISCED 2. These self-assessed confidence levels may reflect the amount of professional training teachers receive – at ISCED 3 it is only about half the EU average. Nevertheless, Austrian teachers do not express a strong desire for more training. While 72%of parents in primary school are highly confident about teaching their child to use the internet safely and responsibly (6% above the EU average), this share drops to 47% in lower secondary school, significantly below the EU average of 67% (European Commission 2019a). Self-confidence in ICT skills among 16-19 year olds has increased: 76% consider their skills to be above basic, an increase on the 2015-2019 average of 61%. This is considerably above the 54% EU average and approaching levels found in the most advanced countries (Eurostat, [isoc_sk_dskl_i]).

After years of bottom-up activities, Austria has increasingly integrated digitalisation in education into its strategic framework. From 2000 onwards, different initiatives in schools ('the E-fit initiative', 'Schule 4.0') promoted different aspects of digital learning. And in 2018, Austria began to develop its digital masterplan for education. The national education report in 2018: (i) called for better consolidation of existing activities; (ii) called for greater consistency (for instance between curricula at all levels); (iii) drew up a list of digital skills (digi.komp8); and (iv) called for greater consistency in media-literacy education (Breit, 2018). In June 2020, Austria adopted an '8-point plan for digital learning', investing EUR 200 million.

Figure 3 - Percentage of teachers who reported that they `frequently´ or `always´ let students use ICT for projects or class work, 2018



Source: OECD database, TALIS 2018, participating EU countries.

Box 1: 8-point plan for digital learning

As of 2020/2021, a single gateway, the 'Digital Schule' portal, should become the main platform for applications and communication between students, teachers and parents. Uneven ICT skills among teachers became more apparent during the COVID-19 school closures. The 8-point plan aims to prepare all teachers for blended and distance learning. This will include intensified continuing professional development as early as summer 2020. Eduthek, Austria's government-owned online education platform, provided access to learning and teaching material during the crisis. Now its content is to be more closely harmonised with curricula. In 2021/2022, a purchasing programme starting with school levels 5 and 6 (age 10 and 11) will upgrade IT infrastructure so that all students have access to devices.

In response to COVID-19, Austria successfully converted all schools to distance learning. Students that stayed home from mid-March had all returned to school premises by June 3rd. And at the end of the school year, students were split into groups for blended learning and organised so that they would come to the school premises in rotation. This allowed a blended combination of on-site and distance learning. The success of the move by schools to distance learning depended on: (i) prior ICT experience/strategies among teachers and students; and (ii) available equipment and software, both at home and in schools. Around 66% of teachers and students said they felt stressed or strongly stressed[1] by the process. At the end of the lockdown, 75 % of teachers reported that they had managed rather well, and 80 % that they had all necessary devices. Teachers found it difficult to adjust the work load for students, and students generally felt more burdened while studying at home. The main approach taken was to go deeper into existing content rather than to teach new content.

Inequalities linked to social disadvantage risk being further aggravated. A big concern has been the potential deepening of the educational divide affecting students from disadvantaged and/or migrant backgrounds. Success in home schooling depended on students' ability to self-organise, their learning conditions, and the support they received. All of these were generally less

[1] University of Vienna, Inclusive Home Learning Study, Schwab, S. et al. (not published). This study identified that 60% of teachers and 65% of students felt stressed or strongly stressed.

favourable for learners with a disadvantaged background. Teachers could not reach around 10% of their students – 16% of students did not own a digital device and 21% indicated that they did not receive support from their parents. The numbers of students at risk of falling behind in their schooling is estimated to be at least around 45 000[2]. The Ministry of Education set up a comprehensive online platform, the Distance Learning Portal, to support teachers, parents and students. Thousands of computers were ordered – albeit sometime after lockdown began – for students who needed them for home schooling. A two week voluntary summer school for 23 000 students, organised two weeks before the school restarted, allowed weaker students to catch up, mainly in German. School leaving exams were held[3] as normal but were slightly delayed and with some adaptations. The 2020 country specific recommendation recommends Austria to take action to 'ensure equal opportunities to education and increased digital learning'.

4. Investing in education and training

General government expenditure on education in 2018 remained stable as a proportion of GDP (4.8%), and close to the EU average (4.6%). Expenditure on education as a share of government expenditure was 9.8%, also unchanged since 2017. Real expenditure has slightly increased at all educational levels. Teachers' remuneration remains the largest expenditure category (64% of total educational expenditure), around the EU average. But the distribution of spending by educational level — 30% in pre-primary/primary, 43% in secondary and 15% in higher education — diverges from the EU average: with a slightly greater percentage at pre-primary/primary level and a slightly smaller at secondary level.

Austria has generally sought to implement education reforms without using more money or staff. However, even before the COVID-19 crisis, this was becoming difficult in view of the many actions proposed in the government agreement and the expected increase in students. In pre-primary education, a new constitutional agreement with the regions is to be concluded. In compulsory secondary school, additional resources may be required to cover commitments on supporting staff, disadvantaged schools, inclusion, and summer/holiday support. Matching resources with educational requirements is a goal which is being tested in the pilot project Chancenindex. This project is being piloted in 100 schools and eventually extended up to 500 schools by 2022, Once the pilot experience is evaluated 'Chancenindex' could target additional funding at the 60 000 'most disadvantaged' students who are found in 295 schools, and an additional 170 000 'disadvantaged' students in 224 schools (Radinger et al., 2018). COVID-19 has triggered additional investments in ICT. Funding levels for higher education are expected to remain unchanged between now and 2027.

5. Modernising early childhood and school education

Although participation in early childhood education and care (ECEC) is increasing, participation is still low for children under the age of 3. The percentage of children aged between 4 and 6, the start of compulsory primary education, who attend early childhood education (ECE) increased to 96% in 2018, up from 93% in 2008. The difference in participation in ECE between regions (i.e. between the region with the most participation and the region with the least participation) narrowed from 10 pps in 2013 to 6.2 pps in 2018. The share of children under the age of 3 attending formal childcare increased from 4% in 2005 to 22.7% in 2019. This is still considerably lower than in comparable countries, like Denmark (66.0%) and Finland (38.2%), and also well below the Barcelona target of 33%. About two thirds of children under 3 attend formal childcare for less than 29 hours a week.

Austria has taken steps to improve quality but more may be required. Responsibility for ECEC in Austria lies mainly with the regions. The 2009 cross-regional education framework plan[4]

[2] 'Lernen unter Covod-19-Bedingungen', www.lernencovod19.univie.ac.at.

[3] Grading was based both on the result of the exam and on the student's average performance throughout the year.

[4] 'BundesübergreifenderBildungsRahmenPlan'.

sets basic requirements while allowing differing implementation in the regions (Breit, 2018). Staff starting salaries in ECEC are just above the OECD average, but below comparable countries like the Netherlands, Sweden or Denmark, and progress little after 15 years (OECD 2019c). Austria remains one of only six EU countries to train ECEC educators below Bachelor level (European Commission 2019d). There are also different regional regulations for external and internal evaluation (European Commission 2019d). Austria is now making efforts to better streamline the system. The current agreement between the government and the regions for 2018-2022 specifies that regions:

- expand available places – in particular for children under 3;
- ensure linguistic support, in particular for 4 to 6 year olds before formal schooling starts;
- further harmonise staff qualifications;
- strengthen the teaching of common values;
- keep ECEC obligatory and free of charge for children over the age of 5.

Experts consulted for Austria's 2018 education report also recommended:

- increasing funding for ECEC to 1% of GDP;
- intensifying research to support evidence-based policy making for ECEC;
- increasing evaluation/monitoring and move to a system where core staff are educated to Bachelor level;
- promoting interaction between ECEC and primary school to facilitate transition.

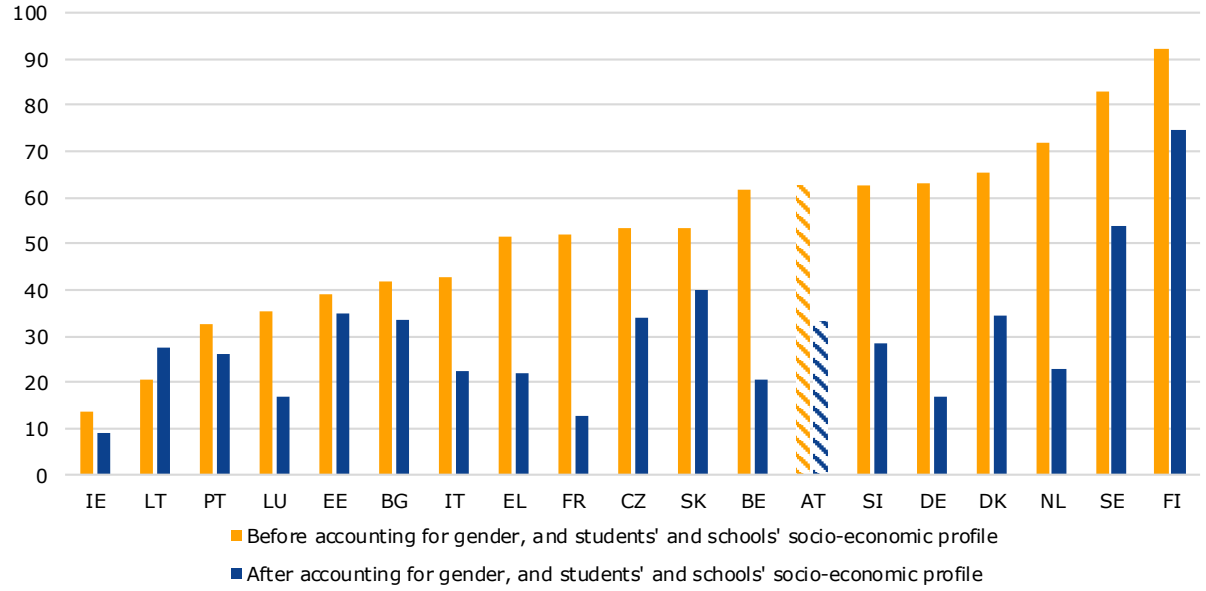
Box 2: Compensation for socioeconomic disadvantage through ECEC depends on its quality.

High quality ECEC is considered in research and policy (OECD 2019c) to be an important measure to compensate for socioeconomic disadvantage. A variety of factors determines quality of ECEC. Attending ECEC in Austria clearly influences PISA results in later life. Young people who had not attended ECEC did worse in PISA tests by a margin above the OECD average (OECD 2019c). In Austria, as elsewhere, advantaged children attend ECEC more often and more intensively than their disadvantaged peers (OECD 2019c). The 2018 Austrian education report underlines that compensation for socioeconomic disadvantage requires high quality ECEC. Mediocre quality ECEC is not neutral and may even have an adverse effect on children's education outcomes. The report therefore stresses the need for children from disadvantaged socioeconomic backgrounds to receive ECEC of particularly high quality. Thus differing perceptions of quality in the regions may hinder equal opportunities. Austria introduced compulsory attendance in ECEC from age 5 to help children from disadvantaged backgrounds catch up with children from more advantaged backgrounds. However, it is not certain that this has been effective. The education report could not, given how ECEC is currently organised, conclude that participation by children from disadvantaged or migrant backgrounds helps them catch up with more advantaged children.

Basic skills levels are close to the EU average and show little improvement over time. According to the OECD's 2018 PISA test, Austria's mean performance is around the EU-27 average in reading (484; EU average: 487), science (490; EU average: 487) and mathematics (499; EU average: 492). There is no positive trend in any of the disciplines compared to PISA 2015. The share of low achievers remains just above the EU-27 average in reading (23.6%; EU average: 22.5%) or just below in science (21.9%; EU average: 22.3%) and mathematics (21.1%; EU average: 22.9%), again with no significant change in recent years. A similar pattern holds for top achievement in reading (7.4% are top achievers; EU average 8.5%), science (6.3% are top achievers; EU average: 6.3%) and mathematics (12.6% are top achievers; EU average: 11%) with no significant change over time.

Socioeconomic and/or migrant background continue to be a major determinant of basic skills. The difference in reading performance between advantaged and disadvantaged students is 93 points, and socioeconomic background explains 13% of performance differences in reading. This performance gap is close to the EU-27 average[5]. The share of Austrian students with a migrant background has continued to increase, rising to 22.7% in 2018. 76.3% of first-generation migrants and 72.4% of the second generation speak a language other than German at home. The latter share is one of the highest in the EU. Those who do not speak German at home score 46 PISA points lower in reading[6]. Generally, foreign-born students score 63 points behind native-born students in reading, while second-generation students score 54 points behind those without a migrant background. Accounting for socioeconomic status, the difference shrinks to a still-significant 33 points. In mathematics, girls on average score 13 points worse than boys, about twice as large a difference in performance with boys than the EU average of only 7 points.

Figure 4 - Difference in reading performance between pupils with non-migrant and migrant background, in score points, 2018



Source: OECD 2019, PISA 2018, Volume II.B1.9.3.

Wellbeing in schools has been stable over time. According to PISA 2018 only about a quarter of students feel they do not belong in school, a level that is relatively unchanged over time. The feeling of not belonging is associated with a significant difference in reading performance in PISA before (-31 points) and after (-18 points) accounting for socioeconomic background (compared to an EU average of -16 and -8 respectively). Bullying is no more frequent in Austria than in other countries.

Austria must make teaching more attractive and further promote the quality of the teaching profession. Because the number of students keeps increasing and the teaching workforce is seriously ageing (European Commission, 2019b), Austria must attract more suitable candidates into teacher training. Austrian teachers earn 87% of the average earnings for tertiary-educated workers in Austria, while school heads earn 115%. For teachers, these earnings are just below the EU-23 average, while for school heads these earnings are significantly below (-19 pps) the EU-23 average (OECD 2019f). Statutory salaries of teachers at lower secondary level increase by 29% after 15 years, equivalent to only 68% of the average progression for other tertiary-

[5] 37.2% of students are in the bottom quarter of ECTS.

[6] Only 5 EU countries have larger differences in the reading performance of children speaking a language at home that is not the language of formal education: LU (96), LT (70), LV (69), MT (63), SE (48).

educated workers in the country. Nevertheless Austrian teachers are comparatively satisfied with their salary (69.9% are satisfied compared to only 35.3% on average in the EU-22) (OECD 2019a).

Working conditions in Austrian schools are generally favourable, although teacher training scores less favourably. According to data from the 2018 OECD Teaching and Learning International Survey (TALIS), student-staff ratios in Austria in lower secondary schools are favourable (7.4 pupils per staff member) and have improved since 2008 when there were 8.7 pupils per staff member (OECD 2019). Class-size ratios are also favourable (20.6 pupils per teacher, up from 30.1 pupils per teacher in 2008). However, teacher training needs to be improved: only 65.3% of Austrian lower secondary teachers feel well prepared for teaching, 16.3 pps below the EU-23 average. These teachers score particularly low on ICT, teaching in a multicultural or mixed-ability setting, and behaviour and classroom management (OECD, 2019). The Austrian education report identifies that initial teacher training lacks sufficient attention to the link of language learning and intercultural and interreligious aspects (Breit, 2018). Austrian teachers are generally satisfied with their career choice, with 85.1% expressing satisfaction, 14.2 pps above the EU-23 average. However, only 16.1% of teachers consider that their profession is valued by society. The government has committed to: (i) evaluate the recently implemented reform of teacher training; (ii) enhance professional development; and (iii) improve opportunities for people to join the teaching profession without initial teacher training (Republic of Austria, 2019).

Austria is reforming education management to give schools more autonomy. Currently, schools have a high level of autonomy in choosing learning material and imposing discipline. They have less autonomy on issues of budget, assessment, admissions and course content; and little to no autonomy on hiring and dismissing teachers and on teacher salaries (OECD 2019a). According to the education report, Austria is seeking to give more autonomy to schools to allow them to team up in clusters and seperately to establish new hybrid school-governance systems that combine regional and federal tasks into newly formed school directorates (Breit, 2018).

6. Modernising vocational education and training

Vocational education and training (VET) remains an attractive option for Austrian students, offering excellent employability to graduates. The proportion of students enrolled at upper secondary level attending vocational programmes remains quite stable at 68.4% in 2018 (compared to 70.2% in 2013), and well above the EU-27 average of 48.4% (UOE, 2018). The employment rate of recent VET graduates in 2019 remained high at 88% (EU average: 79.1%) (LFS, 2019) and comparable that of tertiary graduates.

Efforts are being made to further improve the attractiveness of school-based VET and to address regional imbalances. A newly introduced learning phase in the final year usually takes place in a company for 10 to 12 weeks. The new curriculum applies to most school-based programmes for intermediate VET with a technical, crafts or art focus. The 'supraregional apprenticeship placement-project' was implemented nationwide in 2019, after several years of piloting. It targets the mismatch of vacant apprenticeship places and unemployed young people, and is open to all young people with a particular focus on refugees.

The Ministry of Education and educational providers have developed new five-year and three-year programmes to make the nursing profession more attractive. Starting in school year 2020/2021, these programmes will be directly accessible after completion of compulsory schooling at age 15, and they will include compulsory work-based learning. Graduates of the five-year programme can enter higher education.

A 'dual academy scheme'[7] is under development, which will address the current low attractiveness of apprenticeship training for upper secondary school graduates. After a pilot in Upper Austria in 2018/2019, this scheme is now being offered in other provinces. The

[7] http://www.dualeakademie.at/

incentives include: (i) a shorter training period for matriculation certificate holders (usually between 1.5 and 2.5 years, instead of the more usual 3-4 years); (ii) cooperation with additional training partners, such as universities of applied sciences; (iii) additional training content in future-oriented skills, including stays abroad; and (iv) an attractive starting salary from the first day of training.

On 1 May 2020, an amendment to the Vocational Training Act[8] came into force that allows part-time apprenticeships in certain circumstances, such as childcare obligations or certain health restrictions. The amendment makes it possible for companies and apprentices to agree on a reduction of the daily or weekly training time for up to half of the normal working time. Correspondingly, the duration of the apprenticeship can be increased to up to 2 years.

In contrast to academic tertiary education, with its uniform Europe-wide degree architecture (Bachelor-Master-PhD), higher-qualifying VET is characterised by a marked heterogeneity. There are many different providers and qualifications, which impairs transparency, understanding and trust in these qualifications. At the same time, the skills associated with these qualifications are of great importance for the economy. It is crucial to make higher-qualifying VET more comprehensible for companies, better-known and more attractive. To achieve this, Austria's IBW institute for research and development in VET issued an expert report[9] on behalf of the Ministry of Education to stimulate further discussion and decisions.

7. Modernising higher education

Levels of tertiary educational attainment remain stable. Tertiary educational attainment (30 – 34 year old) stood at 42.4% in 2019, just above the EU average. The employment rate of recent tertiary graduates is 89%, 8 pps above the EU average. Tertiary graduates also enjoy a significant wage premium over those with an upper secondary degree (46% higher earnings, and up to 74% higher for PhDs) (OECD, 2018a). Tertiary educational attainment is highest in Vienna at 50.6%, and lowest in Vorarlberg at 19.9%. People born in Austria were more likely to have tertiary education than people born outside the EU (43.5% v 34.9%) in 2019. University financing levels are guaranteed until 2027, and managed access to university will be further improved. A new medium-to-long-term higher education plan is expected to specify further the roles and tasks of specific sectors as well as their future development. A review has also started on how to improve the employment conditions of mid-level staff. Already before COVID-19, greater emphasis was being placed on the digitalisation of university education.

8. Promoting adult learning

The government programme for adult learning includes many projects designed to strengthen lifelong learning[10]. These include: (i) revising the legal foundations for adult learning; (ii) improving the strategic orientation of adult education and its management; and (iii) further developing the three-year performance contracts with the federal associations of non-profit adult education. The lifelong learning strategy[11] will be further developed. Other proposals include: (i) the financing of continuing education and training through education vouchers for special qualification measures; (ii) the strengthening of financial literacy and entrepreneurship education; and (iii) the promotion and strengthening of democracy/citizenship education. An overall strategy will also be developed for the continued training of employees.

8 https://www.ris.bka.gv.at/Dokumente/BgblAuth/BGBLA_2020_I_18/BGBLA_2020_I_18.pdfsig

9 https://oead.at/fileadmin/Dokumente/bildung.erasmusplus.at/Aktuelles/2019/20191121_4-nat_ECVET-Konferenz_HBB/S-Tritscher-Archan_ibw_HBB_in_AT.pdf

10 http://magazin.vhs.or.at/magazin/2019-2/269-winter-201920/editorial/regierungsprogramm-2020-2024/

11 https://uil.unesco.org/i/doc/lifelong-learning/policies/austria-strategie-zum-lebensbegleitenden-lernen-in-oesterreich-2020.pdf

Austria continues to implement its adult education initiative which aims to improve access to adult learning for the socioeconomically disadvantaged and increase their level of education. It enables adults who lack basic skills or who never graduated from lower secondary education to continue and finish their education free of charge.

The Austrian digitalisation strategy also includes initiatives to foster the acquisition of digital skills by adults. The Fit4internet[12] initiative allows all Austrians to assess their digital skills and to receive proposals for training as a basis for their further personal development. The KMU digital[13] initiative involves building digital literacy in small and medium-sized enterprises, and many media-literacy courses have also emerged in the field of general education. Austrian provinces and chambers of labour offer many support programmes for employees to acquire digital skills, as does the Public Employment Service for unemployed people.

Monitoring and evaluation of the adult learning sector needs to be improved. The 2018 national report on education deals with school education and initial vocational training, but not with adult learning. Coordination with other policies should be strengthened.

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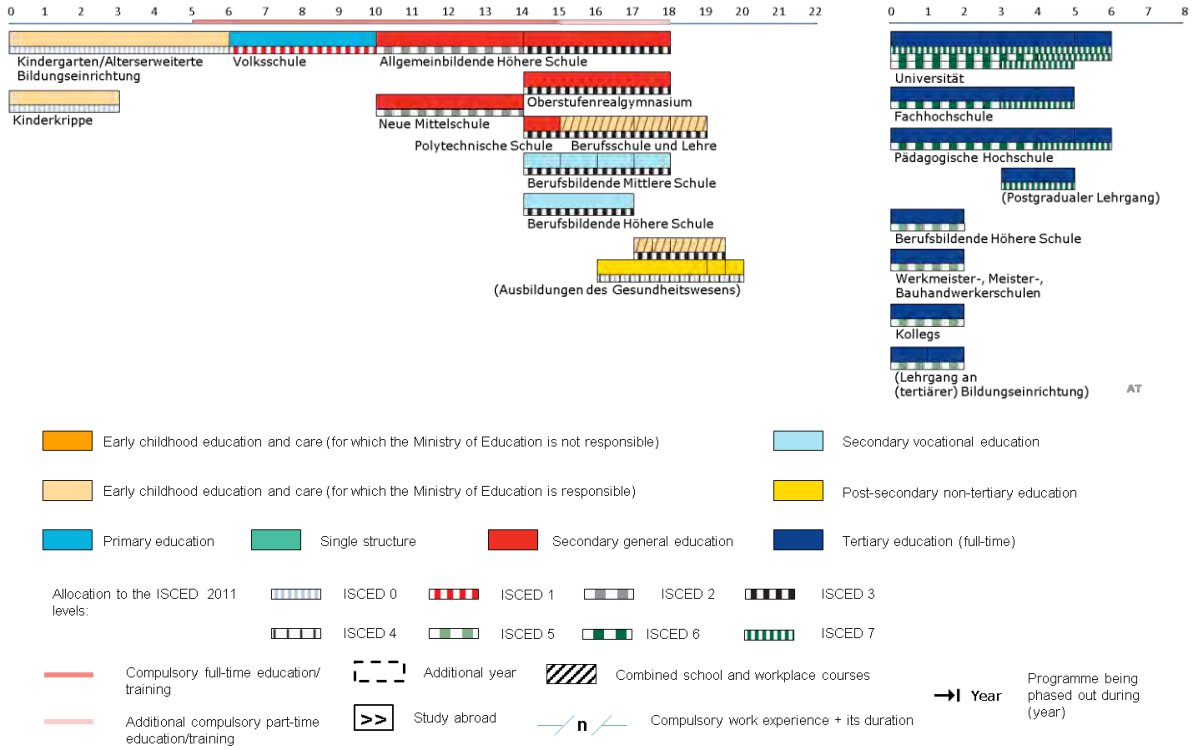
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Klaus KOERNER
Klaus.KOERNER@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

BELGIUM

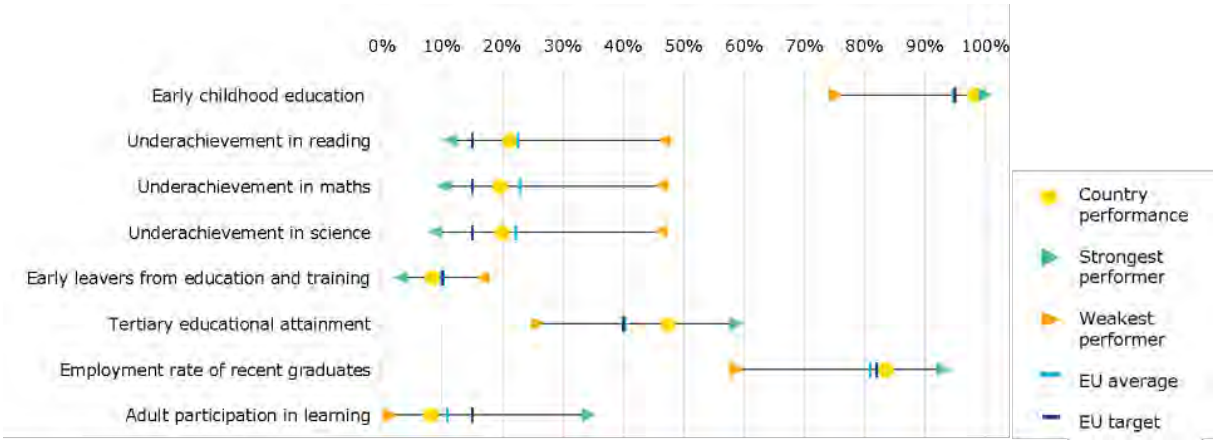
1. Key indicators

Figure 2 – Key indicators overview

			Belgium		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			11.1%	8.4%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			42.0%	47.5%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			99.3%	98.5% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		17.7%	21.3% [18]	19.3%	22.5% [18]
	Maths		19.1%	19.7% [18]	22.2%	22.9% [18]
	Science		18.0%	20.0% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		81.0%	83.5%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		7.1%	8.2%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	3.9% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	6.7% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		6.1%	6.2% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€7 943 [12]	€8 455 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€9 455 [12]	€10 171 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€12 054 [12]	€13 525 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		10.0%	7.3%	12.6%	8.9%
	Foreign-born		20.5%	15.7%	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		44.0%	49.3%	32.0%	41.3%
	Foreign-born		33.0%	42.1%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		71.9%	74.1%	72.2%	75.9%
	ISCED 5-8		87.8%	89.7%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs, : = not available, 12 = 2012, 16 = 2016, 17 = 2017, 18=2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- The Flemish Community (BEfl) has implemented reforms at all education levels. The French Community (BEfr) is implementing reforms in compulsory education, starting with changes to governance and early childhood education and care.
- The COVID-19 crisis highlighted the urgent need to develop digital education in BEfr; the lockdown is likely to increase the digital divide on socioeconomic grounds in all Communities.
- Tertiary education attainment is high; there is scope to increase efficiency in higher education.
- Participation in adult education remains low despite several initiatives.

3. A focus on digital education

Developing young people's and teachers' digital skills is crucial. Half of 16-19 year-olds report above basic overall digital skills (EU average 57%)[14], but 17% consider they have low skills (EU average 15%). Belgian teachers felt less well prepared to use ICT for teaching (27.9%; BEfl 34.5%; BEfr 19.5%; EU-22 37.5%). They also reported the lowest use of ICT for projects or class work (28.9%; BEfl 37.8%; BEfr 18.8%; EU-22 46.9%) (all TALIS[15], 2018).

Infrastructure and equipment in Belgian schools are slightly better than the EU average, but there are regional differences. Belgian schools are on average slightly more digitally equipped and connected than the EU average (European Commission, 2019a) but with large regional variations. Secondary schools in the Brussels Capital Region have the lowest rate of equipment (13.4 devices/100 students in 2017)[16], followed by Wallonia (16.5)[3], Flanders (41.0)[17] and the German-speaking Community (43.6) [3].

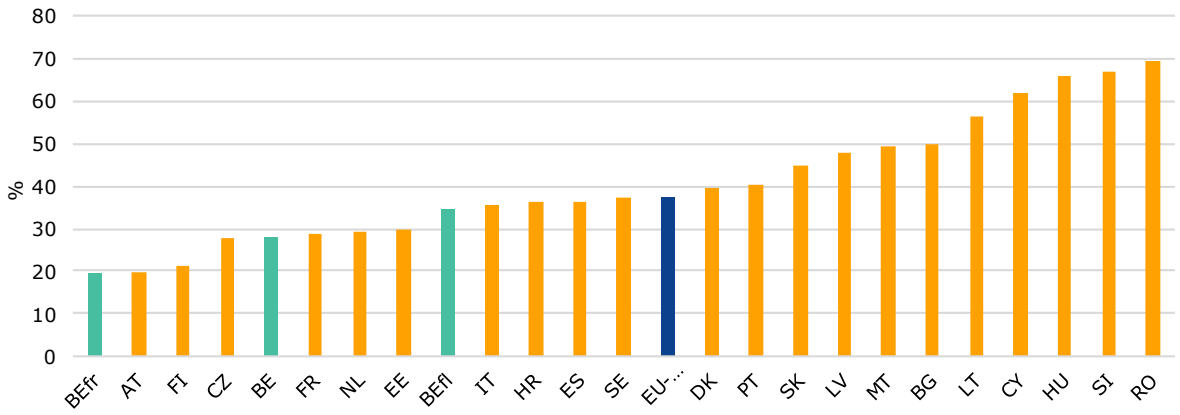
The Flemish Community is active on curricular reform, digital equipment, strengthening media literacy and innovative learning environments (Vlaamse Regering 2019, Strategisch Plan Geletterdheid 2017-2014). Each school is encouraged to have a digital strategy. The Media Literacy Concept Note focuses, among other things, on enhancing competences, e-safety and an e-inclusive society. The programme 'Safe Online' supports parental involvement in digital education. Digital competences, based on the DigComp framework[18], are progressively being integrated into the new primary and secondary curricula as cross-curricular attainment goals. Digital competences in adult education have also been updated. The private sector is being encouraged to co-invest in innovation in schools. Recent government initiatives include the i-Learn project[19], which aims to roll out educational technologies for personalised learning and teacher training in at least 10% of schools by September 2022. Teachers report that they are now more convinced of the usefulness of ICT in education, but this has not translated into increased classroom teaching (Heymans, 2018). The school inspection services have recommended improvement of ICT infrastructure and teacher training (Vlaamse overheid, 2020).

The COVID-19 crisis has shown that it is urgent to implement the 2018 digital strategy for education in the French Community (see Box 1). Curricula for pupils up to 15 and teacher training programmes are being drafted, based on an adaptation of the DigComp framework (Eurydice,

[14] http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_sk_dskl_iisoc_sk_dskl_i
[15] OECD Teaching and Learning International Survey
[16] Digital Wallonia 2018
[17] MICTIVO 2018
[18] https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework
[19] https://i-learn.vlaanderen/

2019). Planned reforms of initial teacher training and curricula are further delayed and will be rolled out gradually, while measures to improve students' digital competences are not yet in place. 'Digital Wallonia' supports annually about 500 digital school projects covering nearly 15% of all schools, linking the allocation of digital equipment to the quality of pedagogical plans and training (Agence du numérique, 2018a). TALIS 2018 data suggest that in BEfr schools digital technology and internet access are among the lowest in the EU. In addition, a comparatively high share of teachers report a high need for professional development in ICT and a low share who feel well prepared to use ICT for teaching (19.5%; EU-22 37.5%).

Figure 3 – Percentage of lower secondary teachers who felt 'well prepared' or 'very well prepared' for the Use of ICT for teaching



Source: TALIS 2018 Results (Volume I) – OECD, 2019.

In the wake of the COVID-19 closures, the Communities are aiming to improve accessibility and quality of blended learning from September 2020. School closures forced schools and teachers to make a substantial turn to digital distance learning. After the partial reopening in mid-May, education resumed with a mix of distance, blended and in-school learning. Data on digital education mentioned above suggest that structural measures are urgently needed if distance learning is to become part of regular instruction methods (Nicaise, 2020). Different surveys indicate that despite efforts, socioeconomically disadvantaged and vulnerable pupils/students and those speaking another language at home were most difficult to reach during school closure. This digital divide likely reinforced existing socioeconomic gaps in education outcomes (see below). In BEfr, the government will provide by October 2020 digital equipment to teachers and the estimated 15-20% of students without equipment, and has developed training modules for teachers' use of digital tools and individualised learning (FWB, 2020a). Additional funding (EUR 17 million) is available to socioeconomically disadvantaged schools to hire more teachers for individualised support and remediation. During lockdown, BEfl provided additional funding to schools for digital education (EUR 5 million), including refurbished laptops. It supported summer schools and doubled the ICT budget for primary and secondary schools to EUR 70 million for 2020/2021. There is scope to develop the pedagogical role of ICT coordinators in schools in all communities.

Box 1: The French Community's digital strategy for education

In October 2018, the French Community adopted a strategy (FWB, 2019a) to address digital disparities within the education system, including between schools. Digital transition is lagging behind other EU countries. Twenty-five priority actions will be delivered over the coming years. Digital skills and literacy in curricula will be strengthened, teachers and heads will receive support and training during initial education and continuing professional development. Pedagogical and technical support will be provided to schools. Minimum equipment and infrastructure standards will be set and additional equipment will be allocated based on schools' needs. A new digital resources platform is being developed where teachers can share and build content and access e-learning courses. The European Commission's structural reform and

support programme (SRSP) is providing expertise in digital equipment and professional support for schools and teacher training.

4. Investing in education and training

In 2018, Belgian general government expenditure on education as a share of GDP was among the highest in the EU at 6.2%, just behind Sweden and Denmark[20]. Expenditure has risen from 6.0% to 6.2% of GDP since 2010. Over the same period, the share of public spending on education also rose from 11.2% to 11.9%, and the real-term increase of 11.3% is well above the EU average of 3.3%. Spending increased most at pre-primary and primary level (12.2%), but also at secondary (4.9%) and tertiary (7.4%) levels. In 2016, the share of private funding in total educational expenditure was relatively low at 6.3% (EU-23 11.8%) (14.7% (23.7%) at tertiary level[21]) (OECD, 2019a). Comparing Belgium with other 'high spending' countries, and noting that expenditure is set to remain high, better educational outcomes should be possible (European Commission, 2019b). Authorities need to make more data available to underpin educational research and evidence-based policy.

Belgium has the highest share of spending on employee compensation in the EU. It accounted for 82.0% of public education expenditure[22] in 2018 (EU average 65%), having increased by 12.2% in 2010-2018 (EU-27 5.4%). This high and growing share reflects higher average salaries at all levels (OECD, 2017 and European Commission, 2019c) and the relatively low pupil/teacher ratio in primary and secondary education[23] (10.6; EU average 12.4), especially in lower secondary education (8.9 v 12.3). Gross capital formation (e.g. buildings, digital infrastructure and equipment) grew by 28.8% in this period, but remains comparatively low at 5.5% of public expenditure (EU average 6.7%). There is an acknowledged need for school infrastructure registers and, in BEfr, for more digital equipment.

Education investments are expected to increase up to 2024 in the French Community (Lecuivre, 2019). The new government, however, has not publicly costed the education priorities of its Community policy declaration (2019-2024) (FWB, 2019b). These cover: strengthening the Pact for Excellence in Education, including the reforms of vocational education and training (VET) and special needs education; adaptation of initial teacher training (ITE) and related salary increases of teachers; funding of higher education; and sustainable school infrastructure. The government expects future savings from the rationalisation of the VET offer and reduced grade repetition (which cost EUR 386 million in 2017/2018) (FWB, 2019c).

Investing in education and training will remain a priority in 2020-2024 for the Flemish government. Priorities include extra funding for primary education and university colleges, school buildings, R&D infrastructure of higher education, and teachers' careers (Vlaamse Regering, 2019).

5. Modernising early childhood and school education

Belgium is lowering the age of compulsory education to 5 and investing in quality early childhood education (ECE). Compulsory education will start at 5 instead of 6 as of 2020/2021. This is expected to particularly increase regular attendance of children with a migrant background or with low-educated parents in large cities. Enrolment in ECE remained high and stable in 2013-2018 (98.5% in 2018), and more children below the age of 3 spent more time in formal childcare or education in 2018 (54.4%) than in 2010 (36%)[24]. In BEfl, operating subsidies per child in ECE were increased from 2019/2020 to the same amount as at primary level (+ EUR 52 million/year)

[20] Eurostat, COFOG: [gov_10a_exp].
[21] Table C3.1.
[22] Eurostat, COFOG: [gov_10a_exp].
[23] Eurostat, UOE: [educ_uoe_perp04].
[24] Eurostat, EU-SILC: [ilc_caindformal].

and recruitment of additional support staff is envisaged. To improve children's Dutch language skills, language tests in the third pre-primary class and follow-up language integration pathways will be implemented from 2021/2022 (EUR 20 million/year). In 2018/2019, one in four pupils (24%) in pre-primary education did not speak Dutch at home, compared to 16% a decade ago. School closure during the pandemic is likely to have affected their language development. In BEfr, there was a decrease in the teacher-to-pupil ratio (to 14.8) in 2017/2018. Measures to improve quality include free ECE for 3 year-olds from 2019/2020 and more language support. The number of teachers and support professionals has also been increased (2017-2019). A first curriculum of 'initial competences' for ECE started in September 2020 (Pact for Excellence in education).

Belgium shows good average performance in basic skills. 15 year-old students in the OECD Programme for International Assessment (PISA) 2018 perform better than the EU average in reading, mathematics and science across all types of learners. While performance is well above the national average in BEfl, there is a long-term downward trend in all basic skills and for all types of achievers. In BEfr, mean performance remained relatively stable compared to 2015 in all three domains, approaching the (decreasing) EU averages.

There are high inequalities linked to socioeconomic and migrant backgrounds. Nationally, about one in five students is underachieving in one of the three disciplines (see Figure 1). Students from disadvantaged (37.1%) and migrant (37.6%) backgrounds are more at risk of underperforming in reading compared to their more advantaged (7.2%) and native-born (16.6%) peers. Language spoken at home, country of origin and education level of the mother explain much of these gaps. The impact of socioeconomic status in BEfl and BEfr is comparatively high – a gap in reading scores of 110 and 107 points, respectively, equivalent to 2.5 years of schooling. Only 9% of disadvantaged students were able to score in the top quarter of performance in reading in Belgium, below the EU average (11.1%) for academically resilient students.

Addressing differences between schools is crucial. Free school choice, school autonomy with limited accountability and de facto tracking based on academic performance contribute to the highest gaps in the EU between advantaged and disadvantaged schools (155 points in reading compared to 130) and between schools with general and vocational programmes (98 points; OECD average 68). Disadvantaged schools have somewhat more favourable student-teacher ratios and class sizes, but have less highly qualified and experienced teachers (OECD, 2019b) and higher teacher turnover. The 2019 European Semester country-specific recommendations to Belgium included to 'improve the performance and inclusiveness of the education and training systems and address skills mismatches' (Council, 2019).

Improving students' well-being could also improve learning outcomes. One in five students (18.6%; EU average 22.1%) reported being bullied at least a few times a month. This is most prevalent in lower secondary education (26.8%), among low-achieving students in reading (25.6%) and in disadvantaged schools (24.3%). The disparity in reading performance among students who report being bullied (18 points) represents up to 6 months of schooling, and the gap between schools with low and high prevalence of bullying[25] is 68 points (EU average 70). Effective anti-bullying policies have the potential to improve reading performance. It is reported that the closure of schools during the pandemic has affected children's mental health and well-being (Children's Rights Commissioner, 2020).

In 2016, Belgium reached its national Europe 2020 target for early leavers from education and training (ELET) of 9.5%. In 2019, the ELET rate dropped further by 0.4 p.p. to 8.4%, below the EU average of 10.2%, but with wide variations between groups and regions[26]. ELET continued to fall for women (6.2%) and for men (-0.1 p.p. to 10.5%), but the gender gap in the Brussels region (6.5 pps) and in Wallonia (6.3 pps) is significantly above the EU average (3.5 pps). The gap for non-EU born (17.7%) and native-born (7.3%) has remained relatively stable (10.4 pps), below the EU average (13.6 pps). A number of measures are now being implemented

[25] Table III.B1.2.7

[26] Brussels (11.8%), Wallonia (10.9%), Flanders (6.2%)

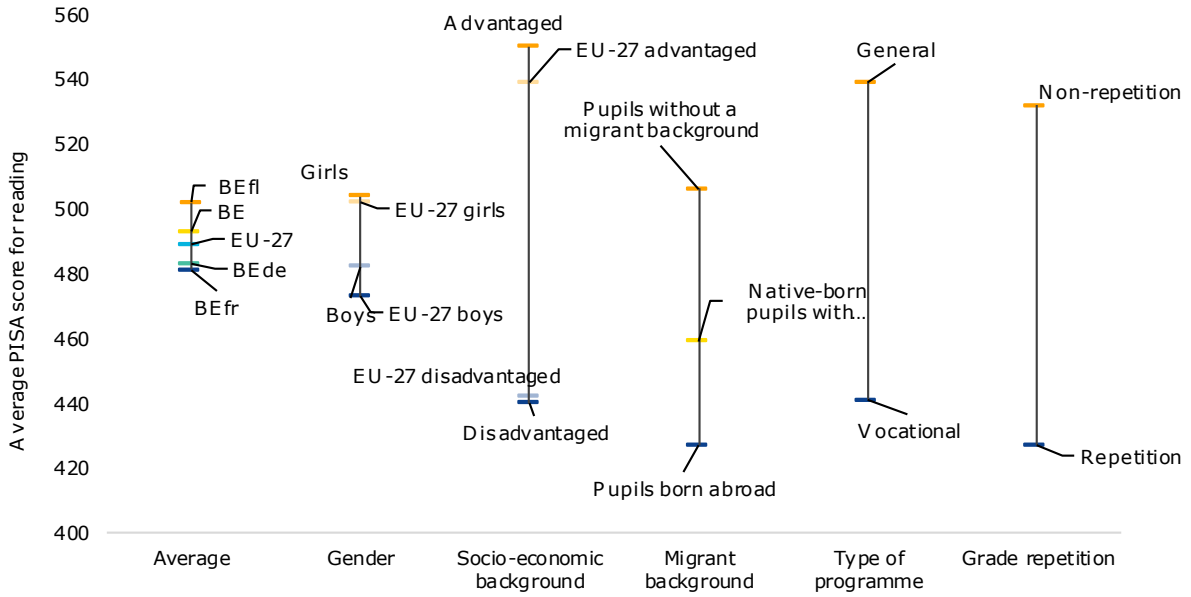
(see 2018 Education and Training Monitor), which should have a positive impact. In BEfr, a comprehensive plan to address ELET and collect administrative data (supported by the European Social Fund (ESF)), will be implemented as of 2021/2022. Improved school governance and the organisation of teachers' working time should help reduce both grade repetition (43%) and early school leaving (ESL). In BEfl, authorities expect that dual learning in secondary education will further reduce ESL. The rate of grade repetition fell slightly between 2012/2013 and 2018/2019 (to 25.8%, down 3.2 pps).

The Flemish Community will focus new curricula more on knowledge acquisition and Dutch language skills. Reforms in secondary education, implemented from September 2019 (European Commission, 2019c), include new attainment targets to be gradually rolled out in 2019-2024 and a better transition to the labour market and higher education. The new government plans to prioritise knowledge content and the acquisition of Dutch in the compulsory curriculum (for ECE see above). Standardised and validated tests will measure how well pupils achieve set attainment targets, and also the learning gains achieved by individual students and schools. Underperforming schools will enter a guidance pathway to improve their performance. The proposal to reform the decree for students with special needs (M-decree) has been delayed because of the COVID-19 crisis.

The French Community is rolling out measures to create 'school learning organisations' and personalised support for pupils, but the curriculum and several other reforms of the 'Pact for Excellence in Education' have been delayed. This systemic reform to improve basic skills, tackle inequalities between pupils and between schools and improve efficiency and governance will extend to 2030 (European Commission, 2019c). Central governance is being reinforced, combined with greater autonomy and accountability for schools. Six-year school development plans are currently being rolled out (FWB, 2018). Increased support for heads and a new organisation of teachers' working time entered into force in September 2019. New approaches to French language learning for newly arrived and vulnerable pupils have been widely taken up by schools (FWB, 2019d). Two hours a week of individualised child remediation support is being implemented through pilot projects in 5% of schools. However, benchmarks for the new common, multi-disciplinary and polytechnical curriculum are still in the adoption process. The combination of a new government coalition in September 2019 and the COVID-19 pandemic may also delay proposed reforms.

The success of educational reforms will depend on attracting and retaining teachers and supporting their professionalisation. In BEfr, from September 2020, a plan to fight teacher shortages (*Plan pénurie*) seeks to retain teachers at the first stage of their career, to better support them, ease mobility and simplify qualification requirements (decree *Titres et fonctions)* (FWB, 2020b). BEfl plans salary increases (1.1% from 2021) for new teachers and mandatory mentoring, continuation of the teacher platforms in primary education, quicker temporary contracts and opportunities for permanent appointments, and promotion of dual teaching. Planned measures also include lateral entry to the profession, more effective induction for new teachers (SRSP project) and reducing the administrative tasks of heads and teachers. BEde envisages a permanent contract and a 10% salary increase for new staff. The communities also adopted reforms to improve the quality and relevance of initial teacher education (ITE) (European Commission, 2019c). BEfl implemented its reforms from 2019/2020. BEfr has postponed implementation by at least a year, to 2021/2022, to work out practical implications including cost. A competence framework will be developed for selection, professionalisation and assessment of school leaders.

Figure 4 – Average PISA 2018 score for reading, by Community, gender, socioeconomic and migrant background, type of programme and grade repetition



Source: OECD (2019) PISA 2018. Note. 40 PISA points corresponds to almost one year of schooling.

6. Modernising vocational education and training

The share of upper secondary students in vocational education and training further decreased. In 2018, this share was 56.8%[27], still 8.4 pps above the EU average. In 2019, 77.1% of recent VET graduates (ISCED 3-4) found employment between 1 and 3 years of graduation, below the EU average of 79.1%.

Concerns remain about the quality of VET. There is a 98-point difference in the PISA results between students in general and vocational programmes, equivalent to more than 2 1/2 years of schooling and substantially larger than the OECD average (1 1/2 years). The graduates/enrolments ratio is far below the EU-28 average (16% v 31%) (European Commission, 2019d), suggesting high dropout. Moreover, when students who followed a vocational programme in upper secondary education go on to tertiary education, only a minority (24% in BEfl and 17% in BEfr) finish within the theoretical duration (OECD, 2019d). All these factors point to the need to strengthen the quality of VET.

All regions have sought to develop dual learning. In BEfl, dual learning was rolled out in September 2019 as an education pathway in mainstream and special needs secondary education, and pilot projects on dual learning in adult and higher education were started. The Flemish Parliament approved in 2019 a new decree on common conditions for quality assurance, with quality to be evaluated at least once every 6 years. In BEFr, major changes in work-based learning were initiated in 2015 (European, Commission, 2016); according to a recent analysis (Cedefop, 2019), there are concerns that these changes resulted in less flexibility and more bureaucracy. More recently, the Walloon government announced a follow-up document to the Marshall 4.0 plan[28] for socioeconomic development which contains an important part on skills development, but its preparation has been delayed by the COVID crisis. The VET reform in BEfr has been postponed to 2021.

[27] UOE data collection

[28] https://www.leforem.be/a-propos/projets-plan-marshall.html

7. Modernising higher education

In 2018, Belgium reached its Europe 2020 national target for tertiary attainment (47%), but disparities remain between regions and groups. The rate was 47.5% in 2019[29]. The rate for men fell for the second year in a row, from 40.6% to 39.8%, but increased from 54.5% to 55.2% for women. There are wide disparities related to socioeconomic and migrant backgrounds. Adults with tertiary-educated parents are nine times more likely to complete tertiary education than those with less-educated parents (OECD, 2018). Although 49.3% of the native-born population aged 30-34 had completed tertiary education, only 35.7% of the non-EU born population had done so. In 2017, the attainment gap for people with disabilities far exceeded the EU average (25.4 pps v 10.2 pps). The employment rate of recent graduates (89.7% in 2019) is above the EU average (85.0%).

Universities perform overall relatively well, but course dropout and graduation time are high. In the U-Multirank, Belgium's universities (11 of 12) perform strongest in the research, knowledge transfer, international orientation and regional engagement dimensions (U-Multirank, 2020). In an OECD benchmarking exercise, BEfl is considered to have a relatively well-functioning higher education system. Areas of strength are high entry rates and the high share of graduates with literacy and numeracy skills above level 3 in PIAAC. Challenges are the low proportion of doctorate holders and few entrants older than 25 to bachelor programmes. Completion rates at bachelor level within the theoretical duration are below the OECD average (OECD, 2019c). Nationally, course dropout and graduation time remain high (De Witte and Hindriks, 2018).

The Flemish Community hopes to improve efficiency by reducing graduation time and rationalising the funding system. Since September 2019, new short-cycle programmes provide increased opportunities for vocational education students to access higher education (HE). The new government plans to strengthen orientation and introduce generalised non-binding entry tests. A revised funding system will also support quicker reorientation in cases of failure among primary degree students. The flexible part of the funding system (*Onderwijsbelastingseenheden)* will be reviewed, with incentives for STEM studies. Dual learning will be extended to higher and adult learning. System-level graduate tracking for VET and HE is well-developed and being updated (European Commission, 2020a).

In the French Community, stakeholders expect additional financing and an adjustment of the 2013 higher education decree (*décret Paysage*). Stakeholders complain about the administrative workload in HEIs and students' longer graduation time. Additional financing in 2018-2020 (*crédits d'impulsions*) was provided to create new first-cycle university courses in geographical areas which have few students. Social subsidies for university and arts colleges and overall funding of university colleges are being gradually increased (FWB, 2019e). The new government programme sets out a gradual budgetary increase for administrative services, building renovation, digital development, student support, inclusive education and R&D. It also plans to strengthen guidance and assessment tools to reduce failure and increase the flow of graduates. System-level graduate tracking in higher education is currently being developed in line with the EU recommendation (European Commission, 2020a).

New STEM action plans aim to meet labour market demand. The Flemish STEM action plan 2012-2020 (Onderwijs Vlaanderen, 2019, 2020) is progressing well, and the STEM-platform has issued recommendations for a more ambitious Plan 2020-2030. BEfr has many initiatives to promote STEM uptake. It intends to set up a STEM strategic plan and make STEM more attractive in higher education. Although the number of STEM tertiary graduates grew by 1.3 pps between 2015 and 2018 to 17.1%, Belgium still ranked 25th in the EU. In ICT, it ranked second from bottom for female graduates (4.3%) and PhD students (0.5%).

[29] Flanders (48.5%), Wallonia (42.2%), Brussels (55.6%) (STATBEL 2019).

8. Promoting adult learning

Participation of adults in training remains low. In 2019, it decreased slightly from 8.5% to 8.2%, while the EU average increased from 10.6% to 10.8%. Participation is low for all educational levels but particularly among low-educated adults (3.4%). The main barriers to adult learning are work, childcare and family responsibilities - cost was least cited as a barrier of all OECD countries.

The regions are taking measures for upskilling and reskilling to address the high level of skills mismatches. The 2020 European Semester country-specific recommendations to Belgium included to 'fostering skills development' (Council, 2020). BEfl plans to increasingly address literacy and numeracy skills and therefore plans a new lifelong learning platform and individual learning accounts, seeking to reduce the fragmentation of adult education policies (Vlaamse Regering, 2019). The Walloon Government intends to strengthen workers' training through a new scheme inspired by the Flemish 'career training vouchers' (European Commission, 2019c) which will support and guide workers wishing to improve their skills or redirection to a job facing labour shortages, with a focus on older workers and those losing their jobs. In addition, a decree on increased cooperation as regards the recognition of skills has been established in 2019 between the different French speaking political authorities. The 'Digital public spaces' (*Espaces Publics Numériques*) were strengthened to foster citizens' digital inclusion (Digital Wallonia). The COVID-19 crisis has accelerated the roll-out of digital adult education.

Box 2: European Social Fund (ESF) project on online training platform on the legal and ethical aspects of artificial intelligence (AI)

ESF will support the creation of an online platform with e-learning modules on the legal and ethical aspects of AI, focused on SMEs and their employees. The programme aims to raise awareness and provide guidance on how to recognise, use and develop ethical and legal AI. The EUR 40 316 project (EUR 13 707 from the ESF) should be ready by June 2021.

https://www.ifori.be/nl/esf/

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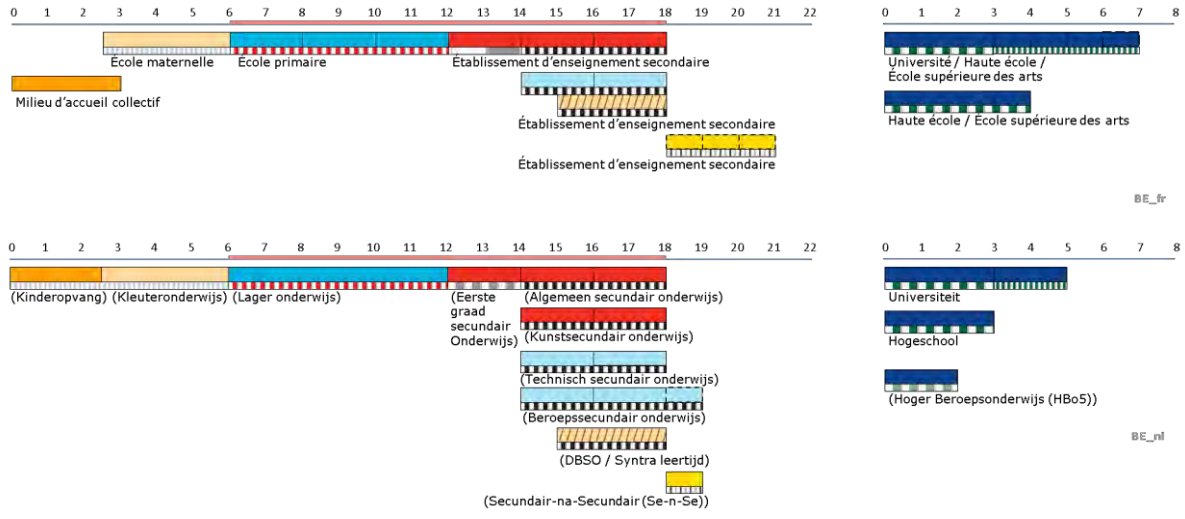
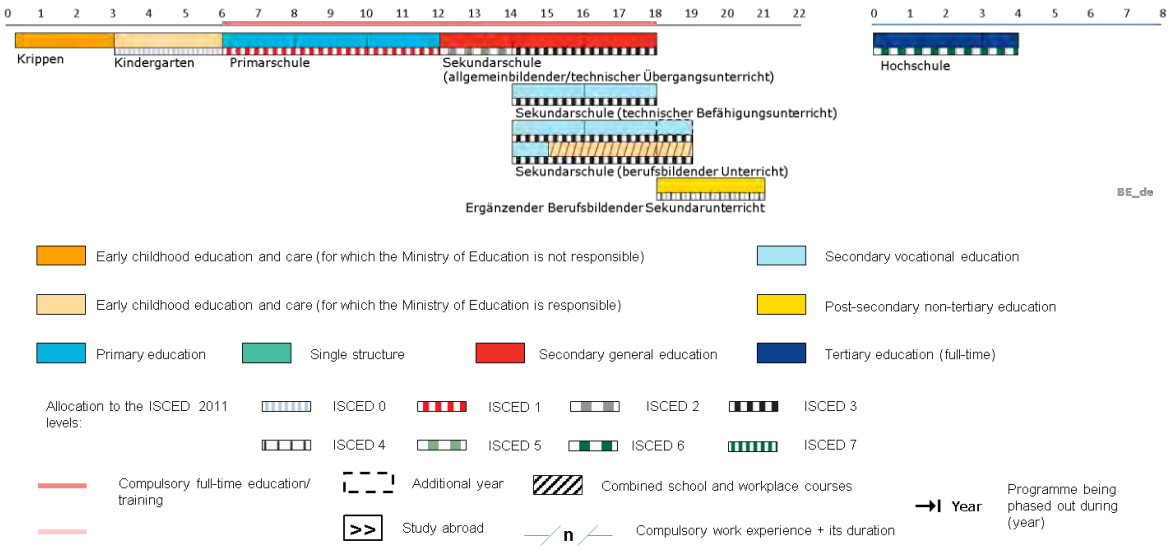
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system

This diagram prepared by the Eurydice network provides information on the structure of mainstream education in EU countries from pre-primary to tertiary level.





Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Brigitte DEVOS
Brigitte.DEVOS@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

BULGARIA

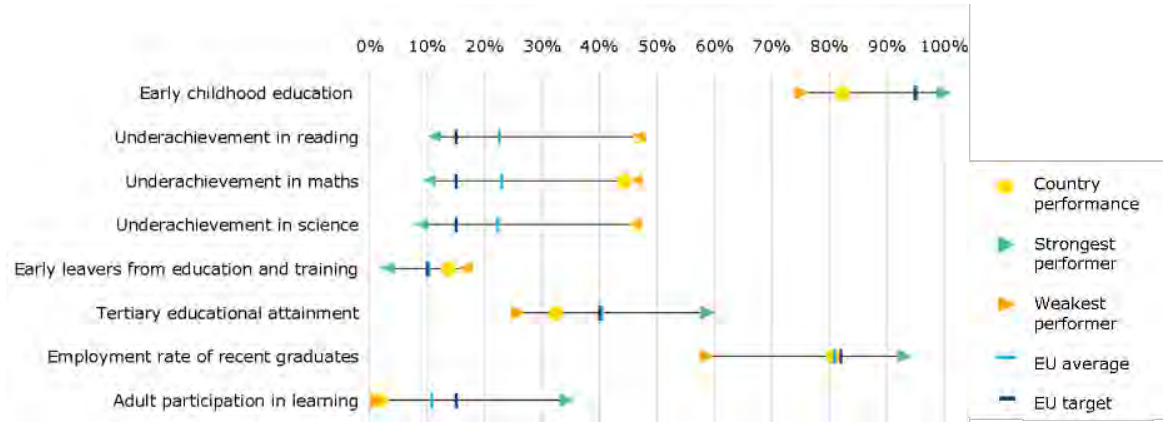
1. Key indicators

Figure 3 – Key indicators overview

			Bulgaria		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			14.7%	13.9%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			27.9%	32.5%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			84.2%	82.4% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		41.0%	47.1% [18]	19.3%	22.5% [18]
	Maths		47.1%	44.4% [18]	22.2%	22.9% [18]
	Science		38.8%	46.5% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		73.6%	80.7%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		1.6%	2.0%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	8.8% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	1.4% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		4.1%	3.5% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€2 034 [12]	€2 521 [16]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€2 106 [12]	€2 577 [16]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€3 818 [12]	€5 197 [16]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		14.8%	14.0%	12.6%	8.9%
	Foreign-born		:	:	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		27.9% [u]	32.4% [u]	32.0%	41.3%
	Foreign-born		:	:	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		63.7%	67.5%	72.2%	75.9%
	ISCED 5-8		85.2%	88.4%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b= break in time series; d = definition differs, u = low reliability, := not available, 12 = 2012, 16 = 2016, 18 =2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Significant efforts are being made to improve the low level of digital skills. Nevertheless, lack of equipment and teachers' insufficient digital competences hamper the use of technology in the classroom.
- Almost half of young Bulgarians lack basic skills in reading, mathematics and science. In spite of growing efforts, the impact of socio-economic status on students' performances is significant, contributing to the intergenerational transmission of poverty.
- Improving the quality and labour market relevance of vocational education and training and of higher education remain important for the Bulgarian economy in the post-COVID-19 context.
- Authorities made efforts to ensure the continuity of teaching during the COVID-19 pandemic. However, the abrupt shift to remote learning has posed major challenges, risking exacerbating already high inequalities in access to quality education.

3. A focus on digital education

Insufficient digital skills among teachers are an obstacle hampering the use of technology in the classroom. In the 2018 Teaching and Learning International Survey (TALIS), 44% of Bulgarian teachers in lower secondary education reported using ICT in most or every lesson, slightly below the EU average of 47% (OECD, 2019a). Although Bulgarian teachers find digital tools useful, meaningful integration of technology in the classroom is not strongly evident: in particular, teachers report the lack of technical equipment and of appropriate products, lack of skills and of time in the curriculum (E. Paunova-Hubenova et al., 2019). Compared to the EU average, Bulgarian teachers tend to have less confidence in their digital skills (European Commission, 2019a). These figures partly reflect the large proportion of teachers older than 50 (see Section 5) but clearly show the need to improve learning opportunities through initial teacher education and continuing professional development. The need for training on how to integrate technology into teaching was also evident during the COVID-19 school closure, with two thirds of respondent teachers in a recent survey reporting no prior training on working with online platforms or distance learning programmes (Bakracheva M., Totseva J., 2020). The programmes 'Qualification of Pedagogical Specialists' and 'Education for tomorrow', co-funded by the European Social Fund (ESF), have been providing training to teachers in various topics, including digital skills.

Bulgarian schools lag behind in terms of digital equipment and IT infrastructure. Compared to the European average, fewer schools in Bulgaria are highly digitally equipped and connected. 32% of Bulgarian students in primary education (EU average 35%), 31% at lower secondary level (EU average 52%) and 37% at upper secondary level (EU average 72%) study in such schools (European Commission, 2019a). In recent years, EU-funded investments were made to improve digital equipment and ICT infrastructure in schools. However, an assessment by the Ministry of Education and Science shows that less than 40% had adequate equipment in their computer labs. Furthermore, a survey conducted between 2017 and 2018 showed that only about half of Bulgarian schools provided conditions enabling technology-enhanced teaching, including modern ICT infrastructure and opportunities for teachers to improve their ICT skills (Terzieva V. et al., 2020).

The need to improve students' digital skills remains high. Only 57% of Bulgarians aged 16-19 assessed their digital skills as basic or higher, significantly below the EU average of 82%. Moreover, Bulgarian students in lower secondary education have less confidence in their digital competences than the EU average. At upper secondary level, students' confidence is above the EU average in digital content creation, problem solving and safety, but not in communication and collaboration, information and data literacy (European Commission, 2019a). Nevertheless, in Bulgaria there are comparatively more students engaging in coding activities (ibid.). In 2019, 73% of tenth grade students who took the compulsory standardised test received a certificate attesting

their level of digital competences. The assessment also indicates the areas that require further improvement, including computational thinking, problem solving and creation of digital content.

Efforts are being made to improve the low level of digital skills. The 2020 Digital Economy and Society Index places Bulgaria at the bottom of European rankings based on the level of digital skills of adults and young people, and ICT specialists. Nevertheless, recent years have witnessed an increasing focus on improving digital skills and digital education. To this end, several EU-funded projects and national programmes aim to upgrade the skills of teachers and students, improve schools' digital infrastructure and strengthen cooperation between the IT sector and vocational education and training (VET) schools. An increasing number of schools are receiving support to apply innovative teaching methods based on digital technologies and gaming. Thirty per cent of Bulgarian schools have already used the 'SELFIE[30]' tool to assess how well they use digital technologies in teaching and learning. Coding is offered as a subject starting from third grade, and the number of upper secondary classes specialising in ICT has increased, while four universities offer programmes in artificial intelligence. Although the measures have not entirely kept pace with the scale of the digital transformation (European Commission, 2019b), these efforts may help improve the acquisition of digital skills, which have become of critical importance in the new realities of COVID-19. In this context, in 2020 the Council of the European Union adopted a country-specific recommendation calling on Bulgaria to 'promote digital skills and equal access to education' (Council of the European Union, 2020).

Box 1: Digital Bulgaria 2025

The national programme 'Digital Bulgaria 2025' sets out Bulgaria's ambitions for modernising and ensuring a widespread implementation of intelligent IT solutions in all areas of the economy and social life. Among its priorities the programme features the improvement of digital competences and skills by supporting ICT research and innovation, modernising school and tertiary education in the area of ICT, increasing the number of highly qualified ICT specialists and improving the digital skills of the workforce. The programme will receive funding from the European Structural and Investment Funds.

[30] Self-reflection on Effective Learning by Fostering the use of Innovative Educational Technologies

Box 2: Education for tomorrow

The project aims to boost digital technologies by creating a platform for educational services and digital content. This improves the process of digitalisation in education, facilitates communication between teachers and parents and provides opportunities for better individualised teaching and learning approaches, as well as encouraging self-study and self-assessment. Teachers in science, technology, engineering and mathematics (STEM) subjects will be offered training to develop digital educational content, e.g. e-manuals, interactive and multimedia lessons, educational applications and games, tests, assignments, etc. Once validated, e-resources are uploaded on the platform and will become accessible to everyone. Students are also encouraged to improve their digital skills through extracurricular activities. To allow these activities to continue online due to COVID-19, about 460 schools received laptops, devices connected to the internet and prepaid internet packages. The project is co-financed by the ESF and has a total budget of EUR 53.5 million.

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4. Investing in education and training

Although expenditure on education has increased over time, it is still one of the lowest in the EU. The latest available data show that in 2018 general government expenditure on education was equivalent to 3.5% of GDP, significantly below the EU average of 4.6% and one of the lowest in the EU. Nevertheless, compared to 2010, Bulgaria's expenditure on education has increased in real terms by 14%, significantly faster than the EU average (3.7%). The increase has primarily benefited secondary education (+23%) and pre-primary and primary education (+18%), whereas spending in tertiary education decreased by 11%. A third of the increase went to finance teachers' salaries, while the amounts invested in goods and services and for gross capital formation (e.g. school infrastructure) have decreased compared to their 2010-level. In 2020, additional funds were allocated to increase teachers' pay and to finance four new national programmes that aim to attract and train teachers in subjects for which shortages are expected, support schools to innovate, provide career development and boost the use of IT in teaching and learning.

5. Modernising early childhood and school education

In spite of efforts by authorities, participation in early childhood education is low. The enrolment rate for children aged 4 to the starting age of compulsory primary school education (7) has been falling since 2015. The latest available data show that in 2018, the participation rate for this age group was only 82.4%, significantly below the EU average of 94.8%. Wide disparities in participation rates persist between regions and districts, with low rates among Roma (FRA, 2016) and others from disadvantaged groups. Substantial efforts were made to increase participation but implementation has experienced some challenges in reaching vulnerable populations, assuring quality standards, and financing services (World Bank, 2019). Bulgaria is also implementing the EU-funded project 'Active inclusion in pre-school education' that finances care-related fees for children from disadvantaged backgrounds, parental education programmes and pedagogical, psychological and social support for children. From September 2020, the age of compulsory pre-school education was lowered from 5 to 4, with some derogations for municipalities with insufficient places. Improving participation rates and further strengthening the quality of services could have a significant positive impact, considering the relatively high proportion of students that speak another language at home, and the crucial role of early years for language acquisition. On the other hand, the enrolment rate for children younger than three in formal childcare has improved considerably in recent years, reaching 19.7% in 2019, even though it is still significantly below the Barcelona target of 33%.

Early school leaving remains problematic. In 2019, the rate of early leavers from education and training (ages 18-24) increased to 13.9%, above Bulgaria's national Europe 2020 target of 11% and the EU average of 10.2%. No substantial progress has been made since 2009 in reducing the rate. Early school leaving is particularly high among the Roma and in rural areas. Measures to

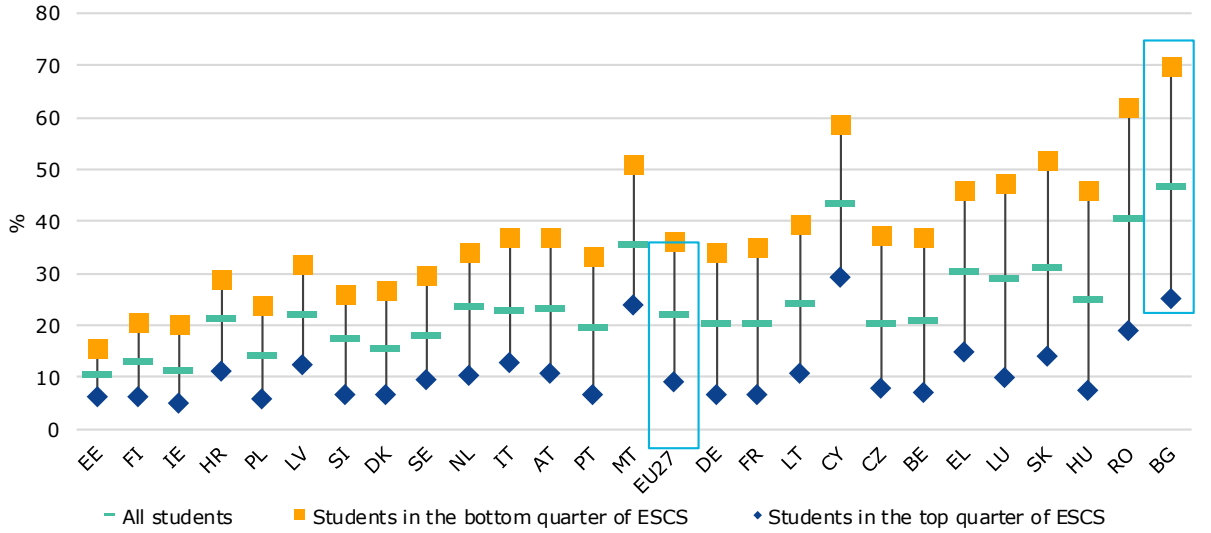
return out-of-school children to education are in place, and support is offered to overcome learning gaps and increase student motivation. These initiatives are seen to have been successful in boosting enrolment and addressing dropout in early years (World Bank, 2019). However, overall enrolment rates in school education are not improving, dropout rates remain high and desegregation programmes are limited in scope. There are also challenges in the completion of upper secondary education, with the latest data showing that only 85% of students enrolled in twelfth grade in 2017/2018 graduated, of which 75.5% in vocational schools and 94.7% in general upper secondary schools (IRE, 2019).

Working conditions of teachers are improving but important structural challenges remain for teacher policies. The teaching workforce in Bulgaria is ageing rapidly, with 49% of school teachers (i.e. from primary to upper secondary) older than 50. 11% are already at least 60 years old. Salaries were raised significantly in recent years to improve the attractiveness of the profession. Between January 2016 and January 2020, the average salary of pedagogical staff in pre-school and school education increased in nominal terms by almost 79%, and by 45% for non-pedagogical staff. Thus, the average gross wage of the teaching staff increased from 94% of the national average to 117%. Despite recent efforts, teacher training is still characterised by a high degree of theory at the expense of pedagogical practice, and insufficient consistency of further training and qualification (IRE, 2019). There is no clear policy to ensure that teachers' skills meet students' needs; nor are there systems to monitor teaching and learning in the classroom or support teachers to effectively improve instruction (World Bank, 2019).

Almost half of young Bulgarians lack basic skills in reading, mathematics and science. The 2018 OECD Programme for International Student Assessment (PISA) shows that 47% of Bulgarian 15 year-olds struggled to understand texts of moderate length and complexity or unfamiliar material. 44% had difficulties in interpreting and recognising how simple situations can be represented mathematically and 47% lacked basic understanding in sciences. These underachievement rates are among the highest in the EU and twice the EU average (22.5% for reading, 22.9% for mathematics and 22.3% for science). Mean performance in reading has remained flat since the start of participation in PISA; it improved in mathematics between 2006 and 2012 and dropped significantly in science between 2015 and 2018, recording one of the largest declines over this period (OECD, 2019b). The proportion of students classed as top performers – who demonstrated complex knowledge in the subjects tested – is very low: 2% in reading (EU average 8.5%), 4% in mathematics (EU average 11%) and 2% in science (EU average 6.3%). The impact of the ongoing education reform on learning outcomes will only be measurable in future testing rounds, when PISA will assess the competences of students who have followed the new school curriculum and received individualised support to overcome learning gaps.

Socio-economic background continues to have a significant impact on learning outcomes. In the 2018 PISA test, students from advantaged backgrounds outperformed their disadvantaged peers by a large margin (106 points in reading, equivalent to more than 2 1/2 years of schooling). Although this gap has declined since 2009 (when it was 130 points), this narrowing reflects lower scores among advantaged students rather than an improvement in the performance of disadvantaged ones. Overall, 70% of disadvantaged students struggled in reading compared to 25% among their socio-economically advantaged peers (Figure 3). This gap (45 pps) is the highest in the EU. Thus, the intergenerational transmission of educational attainment and of poverty remains one of the main factors for overall educational opportunities, early school leaving and subsequent success on the labour market (IRE, 2019).

Figure 3 – Underachievers in reading by socioeconomic status (ESCS), PISA 2018



Source: OECD 2019, PISA 2018 Database. Note: the EU-27 average does not include ES. Countries are ordered by the lowest to the highest gap in underachievement between students in the bottom and in the top quarter of ESCS.

The education system does not break down inequalities already present between students. This is the conclusion of a value-added assessment by the World Bank that used the results of national examinations to assess the contribution of schools to students' progress throughout the years, while taking into account pre-existing educational and socio-economic differences among students (World Bank, 2019). The analysis concluded that the value added by schooling is significantly higher for students whose mother tongue is Bulgarian, compared to Romani or Turkish. It is also higher for students whose parents have higher levels of educational attainment. General upper secondary schools provide higher benefit to their students than vocational schools; there are also notable differences in value added across regions (ibid.). PISA shows that students are highly concentrated in schools based on their socio-economic status and performance. While improvements have been observed in the implementation of the National Roma Integration Strategies in the field of education (European Commission, 2019c), particularly with regards to increasing participation in different levels of education and reducing dropout, important challenges remain, including school segregation.

Although measures were taken to mitigate the impact of COVID-19 in education, the crisis risks exacerbating already high inequalities. To prevent a health crisis, all educational facilities were closed. The Ministry of Education and Research issued guidance to schools and provided technical and methodological support. All schools introduced distance learning through cloud platforms or other means of interaction (e.g. email, internet applications or phone), combining synchronous and asynchronous teaching. Classes were also organised on national television. A national digital library was created for teachers to share lessons and learning materials and all textbooks were made available electronically for free. Nevertheless, authorities estimate that 11% of students could not engage in learning due to lack of internet access or ICT equipment, in particular students from disadvantaged backgrounds and Roma. To compensate for learning gaps, schools were allowed to organise classes during the summer, and almost half of kindergartens organized additional language training. Students that could not take part in remote learning were included in remedial classes, through the 'Support for Success' programme, co-funded by the ESF.

Bullying and truancy affect student outcomes. Bulgaria has one of the highest percentages (34%) of students in the EU who reported being bullied at least a few times a month. On average, the reading performance of these students is almost 40 points lower than their peers. Thirty-one per cent of students reported that in every class, or most, teachers have to wait a long time to quieten down students. These students scored 19 points lower in reading than students who reported that this never happened. Moreover, in Bulgaria, 44% of students had skipped a day of

school at least once in the two-week period before they took the PISA test (EU average: 25.1%) and 57% had arrived late for school (EU average: 49.9%).

6. Modernising vocational education and training

Bulgaria introduced some measures to increase the labour market relevance of VET. In December 2019, the National Agency for Vocational Education and Training submitted an analysis containing specific proposals for the future development of the list of professions for Vocational Education and Training (LPVET) to the Ministry of Education and Science. Bulgaria updated the VET strategy for 2019-2020 by including dual VET. In this context, the project 'Support for the dual training system', co-funded by the ESF, was launched under the coordination of the Ministry. Schools, employers' organisations and participating employers partnered to support and further enhance dual education. Implementation of the measures under the Employment Promotion Act relating to internships and apprenticeships continues in 2020, under which the state budget partially covers the remuneration costs of the unemployed. The latest data available show that enrolment in upper secondary VET increased to 52.9% in 2018, above the EU average of 48.4%. Furthermore, the employment rate of recent VET graduates increased significantly in 2019 to 73.5% from 66.4% in the previous year, but is still below the EU average of 79.1%.

7. Modernising higher education

Falling demographic trends are shaping higher education while the number of foreign students is increasing. In 2019, the number of students enrolled in universities fell at all levels of higher education. Compared to 2014, 21% fewer students were enrolled in bachelor programmes, 16% fewer in master programmes and 3% fewer as PhD candidates. Nevertheless, while the number of Bulgarian students declined by 21%, that of international students increased significantly, especially at master level. Foreign students now account for 8% of the total student body, of which 23% are from Greece, 15% from the UK, 8% from Germany and 7% from Ukraine. The number of Bulgarians studying abroad is also high: in 2018, 8.8% of upper secondary graduates from Bulgaria had completed tertiary education abroad.

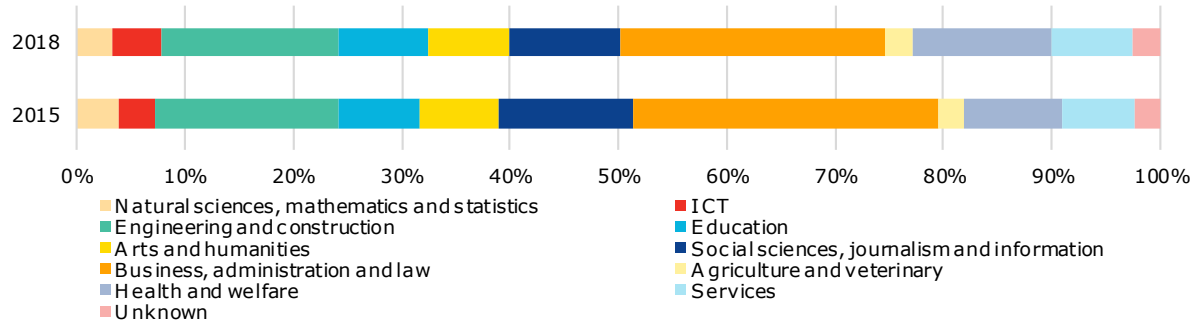
Socio-economic background significantly impacts students' aspirations for a university degree. Overall, 64.3% of teenagers in Bulgaria expect to complete higher education (EU average 62.4%). However, only 42.8% of the poorest students do so, compared to 83.3% of their more advantaged peers. Tertiary educational attainment among the population aged 30-34 was 32.5% in 2019, below Bulgaria's national Europe 2020 target (36%) and significantly below the EU average of 40.3%. The rate has stagnated in recent years: since 2009, it grew by only 4.6 pps, compared to the average growth EU-wide of 9.2 pps. The gender gap persists, with 39% of women in this age group holding a tertiary education degree, compared to 26.4% of men.

Universities were in a better position to shift to remote learning. Most higher education institutions quickly managed to organise courses in an electronic environment due to the availability of better digital infrastructure, multimedia services (e.g. video streaming of lectures, educational platforms, live chat during lectures, etc.) and teaching materials. The academic year finished online, including examinations, with the exception of some specialties, for example, in the field of medicine and art, where practical training could not be conducted online. Admissions were conducted mainly based on the grades from state exams or from electronically conducted assessments, with exceptions in some specialties like medicine, where prospective students had to be physically present.

Improving labour market relevance and quality of higher education remains key for Bulgaria in the post-COVID-19 context. Since 2015, Bulgaria has been using the funding system to shift the profile of graduates towards qualifications in high demand on the labour market, which are to a large extent STEM professions. To this end, higher scholarships and support measures were offered to students in these study fields, alongside increasing the number of state-subsidised places. As of the academic year 2020/2021, tuition fees were eliminated for new entrants in eight professional study fields in the areas of pedagogical and natural sciences and

eight protected specialities (i.e. in the areas of philological and technical sciences). The reforms' impact on study fields is so far mixed. The proportion of new entrants in university programmes in social sciences, business and law declined between 2015 and 2018. The figures remain, however, low for STEM fields, having improved only marginally and mainly in ICT programmes. Notwithstanding efforts by national authorities, the unattractiveness of STEM fields can be partly traced back to the performance gaps in science and mathematics at secondary level, as confirmed by the latest PISA survey. The Higher Education Act was recently amended by introducing novelties concerning the accreditation, funding and the governance model for public higher education institutions, including measures for monitoring and annual reports from the rectors. A new higher education strategy for the period up to 2030 is currently being prepared (Ministry of Education and Science, 2020), whose aim is to increase quality and labour market relevance, including by modernising curricula. Furthermore, among the aims of the future strategy is to set up measures that will increase the role of universities as drivers of regional development, make them more entrepreneurial, and stimulate their research activities. Furthermore, a dedicated national programme was set up to increase the competences of lecturers from public universities, who teach students at the pedagogical departments, by providing training opportunities in various pedagogical and digital competences, including in e-learning environments.

Figure 4 – Distribution of students by field of education, as a percentage of total (ISCED 5-8)



Source: Eurostat, LFS, [educ_uoe_enrt03].

8. Promoting adult learning

Upskilling and reskilling the population remain a significant challenge in the context of the economic recovery from COVID-19. Only 2% of Bulgaria's population aged 25-64 participated in education and training during the preceding 4 weeks of the Labour Force Survey (EU average: 10.8%). Increasing participation in adult learning is particularly important considering that the low-skilled account for 17.5% of the working-age population (25-64). The National Developmental Programme 2030 approved in January 2020 sets a participation target of 7% by 2030. Raising the skills of the working-age population through lifelong learning is considered central to government policy. To this end, incentives and mechanisms will be introduced with the aim of improving skills and supporting the reintegration of the unemployed and inactive low-skilled persons into the labour market. In January, the Council of Ministers approved the national employment action plan for 2020, which outlines measures for the acquisition of professional qualifications and key competences targeting the low-skilled and long-term unemployed and inactive persons. Nevertheless, the effectiveness of implementation of the envisaged measures depends on the quality of the adult education and training offered and its relevance to the needs of the economy and employers. Furthermore, training of teachers and opportunities for acquiring digital competence by adults with a low level of education, especially among disadvantaged groups, remain a challenge.

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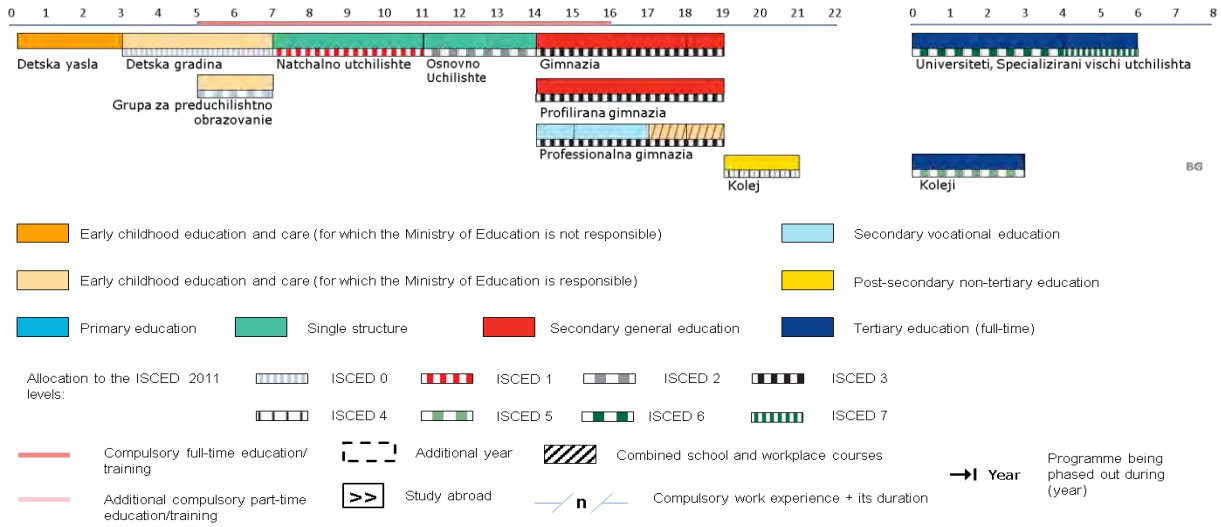
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Alexandra TAMASAN
Alexandra.TAMASAN@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

European Commission

CROATIA

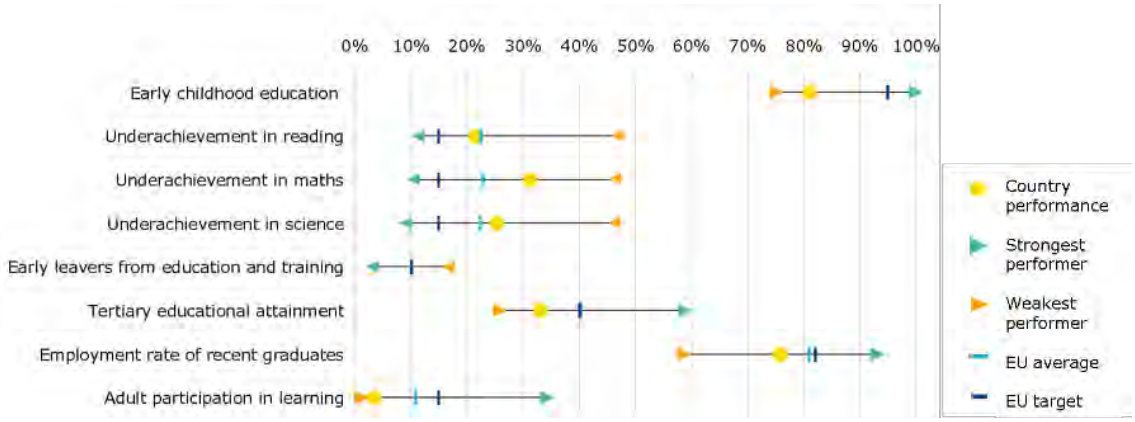
1. Key indicators

Figure 4 – Key indicators overview

			Croatia		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			5.2%	3.0% u	14.0%	10.2%
Tertiary educational attainment (age 30-34)			21.3%	33.1%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			69.2%	81.0% 18	90.3%	94.8% 18
Proportion of 15 year-olds underachieving in:	Reading		22.4%	21.6% 18	19.3%	22.5% 18
	Maths		33.2%	31.2% 18	22.2%	22.9% 18
	Science		18.5%	25.4% 18	17.8%	22.3% 18
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		76.3%	75.8%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		3.0%	3.5%	7.9%	10.8% b
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	3.5% 18	:	4.3% 18
	Credit mobile graduates (ISCED 5-8)		:	3.6% 18	:	9.1% 18
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		3.6% p	5.3% p, 18	5.1%	4.6% 18
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	: d, 12	: 17	€6 072 d, 12	€6 240 d, 16
		ISCED 3-4	€3 337 12	: 17	: 12	€7 757 d, 16
		ISCED 5-8	: 12	: 17	€9 679 d, 12	€9 977 d, 16
Early leavers from education and training (age 18-24)	Native-born		5.3% u	3.1%	12.6%	8.9%
	Foreign-born		3.7% u	: u	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		21.4%	33.8%	32.0%	41.3%
	Foreign-born		18.7% u	25.1% u	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		72.9%	71.8%	72.2%	75.9%
	ISCED 5-8		80.7%	79.1%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs, u = low reliability, p = provisional, : = not available, 12 = 2012, 16 = 2016, 17 = 2017, 18 = 2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Digital education is developing rapidly; Croatia was able to respond effectively to the COVID-19 crisis.
- Participation in early childhood education and care (ECEC) and PISA performance are low, but measures are being taken to improve them.
- Tertiary attainment is low by international comparison, as is the employment rate of tertiary graduates.
- New occupational standards are being developed and the employment rate of vocational education and training (VET) graduates is growing.

3. A focus on digital education

Use of information and communication technology (ICT) in teaching is developing fast and young people have comparatively good digital skills. Developing digital content, tools and methods was one of the goals of the education strategy (Strategy, 2014). Two major projects – e-Schools[31] and the curricular reform[32], both currently being implemented across the system, are extending the use of ICT in teaching and its presence in the curriculum and providing equipment to schools, training to teachers and digital teaching content. The Strategic framework for digital maturity of schools adopted in March 2020[33] sets out a roadmap to 2030 in four areas: a digitally mature environment; digitally mature and confident teachers; ICT as support to teaching; and digital leadership. Since 2018/2019, informatics is a compulsory subject in the fifth and sixth grades of primary and the first grade of general secondary school (and optional in other grades), and ICT is also a transversal subject in all school grades from 2019/2020[34]. Croatia is the only EU country where all 16-19 year-olds have at least basic digital skills (EU average 82%).

Teachers do not feel confident in their ICT skills but large-scale training will have a positive impact. Teachers report the highest lack of continuous professional development (CPD) in ICT skills in the EU (OECD, 2019b) (26.2%; EU average 18%); 36.2% of them (EU-22 37.5) feel well prepared to use digital tools. ICT is a non-obligatory part of initial teacher education (European Commission, 2019b), and ICT skills are not assessed before entry into the profession. The share of teachers who have used ICT for more than 6 years is the lowest in the EU (European Commission, 2019a). In the past year, Croatia has organised mass training of teachers (more than 40 000) and principals under the curricular reform and e-Schools projects. In 2019 a new model for professional advancement of teachers was adopted, rewarding teaching success, innovation and development of open digital education[35].

[31] Pilot phase 2015-2018 in 151 schools, implementation in all schools 2019-2022.

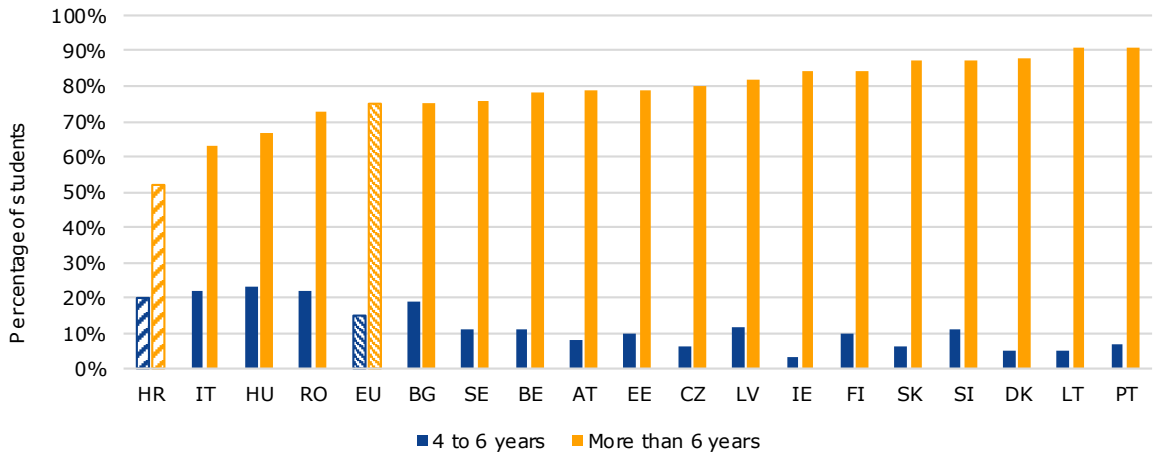
[32] Pilot phase in 2018 in 74 schools, implementation in all schools 2019-2022.

[33] https://mzo.gov.hr/UserDocsImages//dokumenti/PristupInformacijama/Strateski-digitalno2030//Strateski%20okvir%20za%20digitalno%20sazrijevanje%20skola%20i%20skolskog%20sustava%20u%20Republici%20Hrvatskoj%20-%202030.pdf

[34] https://skolazazivot.hr/kurikulumi-2/

[35] https://www.nszssh.hr/pdf/Pravilnik%20o%20napredovanju%20NN%2068%20od%2017%20srpnja%202019.pdf

Figure 3 - Share of primary students with teachers having experience in using computers/internet at school, 2017/2018



Source: 2nd Survey of Schools, Vol. I – Benchmarks, p. 45

Schools' digital equipment is improving. Schools are far less digitally equipped and connected than the EU average. Students' weekly computer use in school is below the EU average. The share of students with access to a virtual learning environment is well below the EU average at all school levels, both in school and from home (e.g. for lower secondary school 12% v 54% and 69% v 89%, respectively) (European Commission, 2019a). Primary school principals point to the lack of equipment as a main barrier to digital learning; their counterparts in secondary schools cite teachers' weak digital competencies (Dekanić et al., 2019). Since 2019, the e-Schools project is providing all schools with equipment for classrooms and staff (to be completed by 2022). Pupils in primary schools are being provided with tablets through the curricular reform project – by 2022 all pupils in grades 5-8 should have one and there should be one per four pupils in grades 1-4. The government has purchased tablets for upper secondary school pupils receiving social assistance[36]. Croatia received a country-specific recommendation to 'Increase access to digital infrastructure and services. Promote the acquisition of skills'. (Council of the European Union, 2020).

Building on current projects, Croatia was able to respond well to the COVID-19 crisis. The measures being taken under the curricular reform and the e-Schools project helped to enable the system to urgently move to distance education at the onset of the crisis. Even though only part of the programmed school equipment was in place, and not all teachers had been trained, the Ministry combined existing elements to rapidly and effectively provide online classes[37].

4. Investing in education and training

Spending on education and training is above the EU average. In 2018, Croatia spent 5.3% of its GDP on education (EU-27 4.6%); the share of total general government expenditure (11.5%) was also above the EU-27 average (9.9%). Between 2017 and 2018, public spending on education rose by 1.5%, with the largest increase going to pre-primary and primary education (4.2%)[38], probably reflecting the pilot phase of the curricular reform. The state education budget for 2020 received a 7.6% increase (HRK 18.6 billion), mainly to fund a three-step increase in teachers' salaries agreed after a strike in 2019. Due to COVID-19, this will be delayed until 2021. Funding of higher education institutions (HEIs) through performance contracts is 20% higher this year.

[36] https://mzo.gov.hr/vijesti/divjak-1-36-milijuna-kuna-srednjim-skolama-za-nabavu-tableta-ucenicima-slabijeg-socijalno-ekonomskog-statusa/3314

[37] For more details, see box on page 9.

[38] Eurostat, COFOG 2018.

There are measures to expand ECEC. Financing of ECEC is the responsibility of local government; there are big regional differences and poor provision in less-developed areas (Dobrotić et al., 2018). Recently, the Ministries of Demographics, Family, Youth and Social Policy and of Agriculture developed projects with EU funding for construction and reconstruction of almost 500 kindergartens, around 200 of which in locations with fewer than 5 000 inhabitants[39]. The Ministry of Demographics is also offering EUR 1.8 million to undeveloped local government units to improve availability and quality of ECEC (MDOMSP, 2020). The extent to which these initiatives will address needs is not yet clear.

5. Modernising early childhood and school education

Participation in ECEC is among the lowest in the EU. In 2018, formal childcare attendance for children under 3 (17.8%; EU-27 34.7%)[40] was one of the lowest in the EU and so was early childhood education for those between age 4 and the beginning of compulsory education (81%; EU-27 average 94.8%), which was far below the EU benchmark for 2020 of 95%[41]. Progress since 2010 has been rapid, however (+10.6 pps for age 4 and upwards; EU-27 +2.2 pps). Croatia has the biggest participation gap between high (70%) and low socio-economic background (SES) children (22%) and a significant urban-rural divide (UNICEF, 2018). Of 556 local self-government units, 76 (all among the 270 'undeveloped' units) have no local ECEC provision[42].

Measures are being taken to increase ECEC participation. Pre-school programmes of 250 hours are obligatory in the year before school, and free for children who have not attended kindergarten before (about 30%) (European Commission, 2019c). Barriers to ECEC participation include gaps in infrastructure, teacher shortages and the need to educate parents about its importance. The teachers' trade union has argued that difficult working conditions – large numbers of children in groups, and long hours with no compensation for overtime – lead many to leave the job[43]. ECEC teachers were one of the 10 most-needed professions on the labour market in 2019[44]. There was a proposal to hire primary teachers where there are no ECEC-qualified applicants, and to allow a 20% increase in group size (currently maximum 18-25 children, depending on age group) to tackle shortages. Stakeholders rejected the idea, citing the negative effect on quality. In February 2020, an Expert Committee for Monitoring and Development of ECEC was established and the Ministry of Demographics established a Directorate to coordinate policy.

Education had to adapt to the pandemic and other extraordinary events. Kindergartens and schools closed from 16 March due to the COVID-19 crisis. Despite opposition by teachers' unions and parents[45], primary schools partially reopened for younger pupils, with restrictions, on 11 May. In secondary schools, distance education continued until the end of the school year while in VET, activities that could not be handled online were delivered in schools or employer's premises, with restrictions[46]. The final exam ('Matura') was delayed to June/July, with content taught in second half of the year in maths and Croatian excluded. On 22 March, Zagreb was hit by a major earthquake that severely damaged 26 of 226 ECEC facilities, 30 schools and several university buildings. At the beginning of the school year, schools had also been affected by a 36-day teachers' strike; classes missed due to the strike had mostly been compensated before COVID-19 arrived.

39 http://arhiva.gradonacelnik.hr/vijesti/vinkovci-i-nin-najvise-su-lani-izdvojili-u-proracunu-za-predskolsko-obrazovanje

40 Eurostat, EU-SILC: [ilc_caindformal].

41 Eurostat, UOE: [educ_uoe_enra10].

42 Data from 2017, MSE: www.mzo.hr and Ministry of Demographics https://mdomsp.gov.hr/

43 https://www.edusinfo.hr/DailyContent/EdusNews.aspx?id=39593

44 https://burzarada.hzz.hr/Posloprimac_RadnaMjesta.aspx?trazi=1&pojam=ODGOJITELJ&top=1

45 68.2% were against reopening schools - http://www.fso.hr/2020/04/23/upitnik-foruma-za-slobodu-odgoja-dvije-trecine-ispitanika-protiv-pocetka-nastave-u-svibnju/

46 https://www.hzjz.hr/wp-content/uploads/2020/03/Srednje_skole_13_05.pdf

Schools shifted rapidly to distance learning, but the wellbeing of students and equity were affected. While the shift to distance learning was rapid and successful overall, there were some adverse effects on equity and student wellbeing. A survey of 65 schools with Roma pupils showed that in 30% of these more than 30% of Roma students did not participate in distance classes[47]. A survey by the Institute for Social Research showed that pupils were overall satisfied with distance learning and the involvement of teachers, but that many were stressed about learning new content in isolation, preparation for the Matura and enrolment in HEIs (Ristić Dedić, 2020). In April, the National Centre for External Evaluation of Education launched an online platform to help students prepare for the Matura, with access to questions from previous Maturas plus explanations and guidelines to teachers on preparation of tasks and evaluation procedures (NCVVO, 2020).

Early school leaving is low, but higher in rural areas. Croatia's early leavers from education and training rate of 3%[48] is the lowest in the EU (EU-27 average 10.2%)[49] and below its Europe 2020 national target of 4%. In 2013-2019, the number of students fell, due to the demographic decline, in both primary (9.37%) and secondary schools (19.17%), with much higher decreases in rural counties[50].

Pupils' basic skills are below the EU average, with significant gender gaps. The OECD's Programme for International Skills Assessment (PISA) 2018 shows that pupils perform below the EU average in all tested subjects (reading 10 points, science 17 and maths 29). The shares of underperformers in science (25.4%; EU-27 22.3%) and maths (31.2%; EU-27 22.9%) are among the highest in the EU, and only in reading is underperformance around the EU average (21.6%; EU-27 22.5%) (OECD, 2019, Vol. I). Average scores and underperformance rates have both worsened over the long term[51], and the proportion of top performers in all three subjects is also among the lowest (1.3%; EU 3.4%). Gender gaps are high and worsening in science and reading (with girls outperforming boys by 4 and 33 points, respectively), but have diminished in mathematics (where boys perform better) (OECD, 2019, Vol. II). Poor performance may reflect the effects of low annual teaching time in primary and lower secondary education (275 and 240 hours less than the EU averages), schools operating in shifts due to infrastructure shortages, the short compulsory schooling cycle of only 8 years, the outdated curriculum, now being modernised (European Commission, 2020), and the shortage of STEM teachers. With World Bank assistance, the government is formulating plans to increase instruction time, optimise the school network, improve assessment and introduce modern management practices over 10-20 years (World Bank, 2019). Experimental implementation of a 'whole day school' project is planned for the first three grades of primary (NRP 2020, p. 39 and 83). In January 2020, the MSE presented an application comparing results of pupils of various gymnasiums and vocational schools in the Matura and Matura results with their final primary and secondary grades[52]; the National Centre for External Evaluation of Education fears this might have a negative impact by increasing performance pressure and narrowing the focus of teaching to exam performance. Students enrolled in STEM gymnasiums show the best results. In other gymnasiums, there is bigger disparity between Matura results in maths and Croatian, and higher final grades given by schools in those subjects.

47 https://infogram.com/ukljucenost-ucenika-romske-nacionalne-manjine-u-nastavu-na-daljinu-1hmr6gvrl57z6nl?live&fbclid=IwAR0A2un5vpfc4Lqzdd0x1BM0uOuH6xDKBQnYGOLFKvh7vaDdqNBl7jF8EwQ

48 Low reliability.

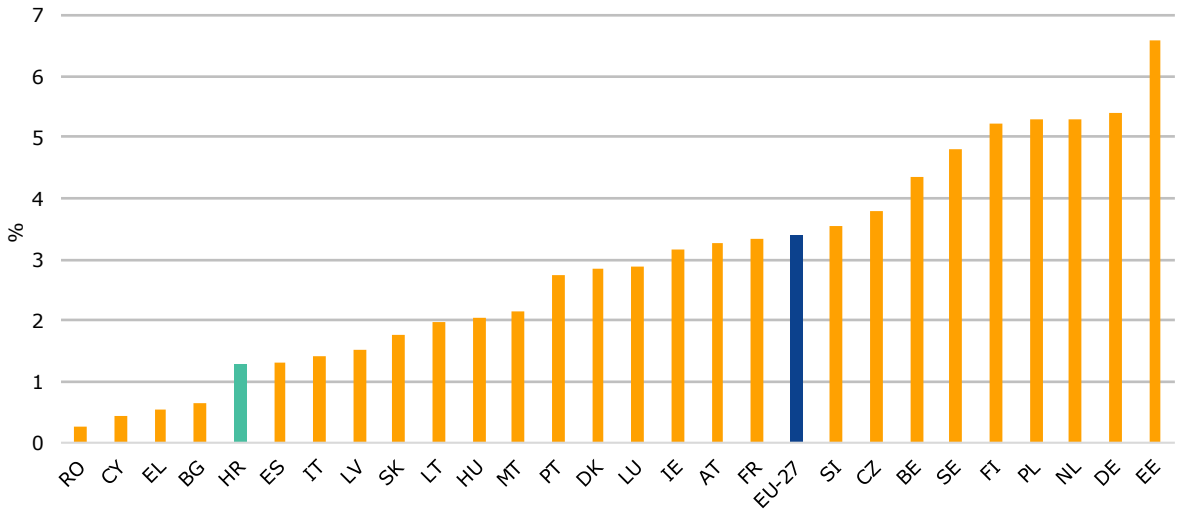
49 Eurostat, LFS: [edat_lfse_14].

50 https://mzo.hr/hr/ser-skolski-e-rudnik

51 In science, e.g., the mean score has fallen by 21 points and the share of underperformers increased by 8.4 pps since 2006.

52 https://www.mzos.hr/vijesti/ser-skolski-e-rudnik-vol-3/3404, https://app.powerbi.com/view?r=eyJrIjoiOTUxNTE3YmQtM2E3MC00MDc0LTg3OTQtYTExZWZhYzU3Y2FlIiwidCI6IjJjMTFjYmNjLWI3NjEtNDVkYi1hOWY1LTRhYzc3ZTk0ZTFkNCIsImMiOjh9

Figure 4 - Top performers in all three domains, PISA 2018



Source: OECD 2019, PISA 2018. The EU average does not include ES results.

The impact of SES is comparatively low. The underachievement gap between pupils from low and high SES is below the EU average (17.4 pps v 26.9 pps), and academic resilience[53] at 15.2% is the second best in the EU, suggesting that the system can recognise and nurture the talents of disadvantaged students (OECD, 2019, Vol. II). New equity measure has been introduced: upper secondary school pupils who are beneficiaries of social assistance received tablets and SIM cards. The lack of specialists and support staff[54], including psychologists and speech therapists[55], is a challenge, despite some recent improvements. Administrative delays at the beginning of the school year meant that many special-needs pupils did not have the necessary teaching assistants[56]; the government has acted to prevent such problems in the future (Official Gazette, 2020). However, part of the responsibility to fund these staff was moved to local self-government units, which may create further problems and inequalities[57].

School climate is good. Reported bullying and truancy are lower than the EU average, fewer students feel that they do not belong in school and impact on reading performance is lower (OECD, 2019, Vol. III). In February 2020, the MSE adopted the Action plan for the prevention of school violence 2020-2024, with a budget of EUR 4 million for legislative changes, data collection and prevention programmes (MZO, 2020b).

Teachers are well qualified. Almost all teachers are fully certified (99% in advantaged and 97% in disadvantaged schools) (OECD, 2019-HR) and most have a master's degree, but half of schools report a lack of educational materials (OECD, 2019, Vol. II, p. 23). Teacher shortages exist in mathematics and physics, foreign languages, informatics and music (HZZ, 2020).

Implementation of curricular reform has started in all schools. Reformed curricula were adopted in 2019, have been implemented in four of twelve grades and will extend to all by 2022. Training and support materials have been developed to help teachers implement new elements such as learning outcomes, different types of assessment and teaching transversal themes. ICT equipment to support new teaching methods is being delivered (see digital section).

53 Percentage of disadvantaged students who scored in the top quarter of PISA 2018 tests in reading.

54 A study by the Association Psychological Spring showed that, of 880 primary schools, 233 employ fewer specialists than prescribed (Švigir et al., 2020).

55 https://www.edusinfo.hr/DailyContent/EdusNews.aspx?id=40845

56 https://www.tportal.hr/vijesti/clanak/divjak-o-pomocnicima-u-nastavi-preuzimam-odgovornost-kao-jedan-od-dionika-20190920; https://dijete.hr/izvjesca/izvjesca-o-radu-pravobranitelja-za-djecu/

57 http://www.novilist.hr/Vijesti/Rijeka/Struka-sokirana-Ovo-sto-rade-pomocnicima-u-nastavi-stvorit-ce-jos-gore-scenarije-u-skolama?meta_refresh=true (comments of the Head of the Department for Education in the City of Rijeka).

Box 1: Effective response to the COVID-19 crisis building on ongoing projects

The e-Schools project (pilot started in 2015, implemented in all schools in 2018-2022) introduced ICT into schools by providing infrastructure, equipment, digital educational resources and workshops for teachers. In parallel, curricular reform introduced new curricula and 122 digital methodological handbooks and further improved equipment for students and training of teachers. Together, they provided the basis for a rapid transition to distance education when the COVID-19 pandemic struck. Additional measures taken included:

- digital platforms for teacher training and exchange of good practices were used to move classrooms and staffrooms online, including in VET and adult education;
- 300 trained teachers mentored others on the transition.

Textbooks for new curricular subjects are 30% digital and non-governmental organisations also published e-materials. In cooperation with Chamber of Commerce, companies have also sent the materials used for in-company training of their staff.

Two weeks before schools closed, the Ministry started intensive preparations, producing new content and issuing guidelines to schools on how to organise distance learning. Later, it issued Guidelines for assessment and grading in virtual environments (MZO, 2020c), encouraging formative and project and problem-solving based assessment.

How distance education was organised:

- Primary school, grades 1-4 (ages 7-10): lessons through public television and teachers communicating with parents through chat groups and social networks.
- Upper grades of primary, and secondary school (ages 11-18): short video lessons on TV combined with online learning.
- Each week, 25 hours of new TV programmes and 300 video lessons were created, more than 100 hours and 1 200 video lessons in total.
- Video materials to prepare for the Matura were broadcast on public television.
- Pupils in fifth and seventh grades of primary schools and secondary school pupils receiving social assistance had been receiving tablets since December. For sixth and eighth grade pupils, schools were tasked to lend tablets to pupils lacking computer and internet at home (MZO, 2020). Arrangements were made to allow several pupils in one household to do their schoolwork at different times.
- The Minister maintained direct contact with pupils and teachers through her Facebook account.
- A week after the move to distance education, psychological help teams were created to support pupils, parents and teachers, on the phone or online[58].

These experiences will feed into a future Strategic framework for distance education. The Ministry has published an Action plan for distance education (MZO, 2020d) and Models and recommendations for schools in COVID-19 conditions (MZO, 2020e).

6. Modernising vocational education and training

Efforts to better align VET with the labour market are progressing slowly. The employment rate of recent VET graduates has further increased from 68.8% in 2018 to 73.9% in 2019, still below the EU-27 average of 79.1%. The Ministerial campaign promoting enrolment in the apprenticeship VET scheme (JMO) offered significantly more scholarships and grants for apprentices and companies in 2019/2020, yet participation in work-based learning programmes

[58] https://www.edusinfo.hr/DailyContent/EdusNews.aspx?id=41013

increases slowly. The establishment of Regional Centres of Competences and the experimental programme in dual education should improve the quality of VET and facilitate the identification of skills needs. These centres of VET excellence include innovative learning models, teaching excellence, high-quality infrastructure and technology, constructive and creative cooperation with social partners, public sector, businesses, research and higher education institutions and cooperation with similar centres across Europe. Once fully functional, Centres will provide a comprehensive set of services that go far beyond the regular educational offer in VET. In the first phase the centres were appointed in five sectors.

Development of occupational standards progressed in 2019/2020, but comprehensive curricular reform is still to come, i.e. qualifications standards in VET, sectoral VET curricula and a model school curriculum for VET. Full transition to a learning outcomes-oriented system linked to the labour market is planned for 2022/2023 as a response to rapid technological progress, globalisation and demographic challenges.

Box 2: Improvement in literacy as a basis for lifelong learning

This open call funded 21 primary and secondary school projects, developing activities and training materials within school curricula to enhance different types of literacy: mathematical, financial, digital, STEM, information, media, reading, and multicultural/intercultural. In total, 1 334 teachers and 2 771 students participated.

Budget: EUR 3 570 000 total (EUR 3 034 500 from the European Social Fund (ESF)).
http://www.esf.hr/natjecaji/obrazovanje/unaprjedenje-pismenosti-temelj-cjelozivotnog-ucenja/

Project example: Modern curricula for modern society

This project aimed to enhance the capacities of two VET schools in Split (the Maritime school and the School of Commerce and Trade), and create a framework for increasing students' scientific, financial, digital, multilingual and multicultural literacy. Three new subjects were introduced that use ICT for data analysis, making graphics and interactive digital maps: Chemistry of the Sea; Personal Finance and Financial Environment; and Cultures of the World. Eighty students and 11 teachers participated. Teachers' and pupils' handbooks were produced and chemistry laboratories equipped. Schools established cooperation with the Institute for Oceanography and Fisheries.

Implementation period: 2017-2019.
http://sn4sd.pomsk.hr/

7. Modernising higher education

Tertiary attainment (TEA) is low, with a significant gender gap, and the number of students is declining. TEA in 2019 is one of the lowest in the EU (33.1%; EU-27 40.3%), below the national 2020 target of 35%. The difference between women and men (41.8% for women v 24.7% for men) is very high, 17.1 pps compared to the EU-27 10.5 pps[59]. The numbers entering tertiary studies are declining, while available study places are increasing. In 2015/2016 the candidate-to-place ratio was 1:1.14; in 2018/2019 it dropped to 1:0.82, leaving 11 341 vacant study places (MOZVAG, 2019). A decrease in enrolment in 4-year secondary school programmes (36 900 in 2011 to 28 500 in 2018) may indicate a further decline in graduates after 2025 (Matković and Marcelić, 2020).

Employment rates for tertiary graduates are among the lowest in the EU. The employment rate of recent graduates from education and training (ISCED 3-8) in 2019 (75.8%) is below both the EU benchmark for 2020 (82%) and the EU-27 average (80.9%). For tertiary graduates it is

[59] Eurostat, LFS: [edat_lfse_03].

also below EU average (79.1% v 85%)[60]. Almost 50% of students want more internship programmes during their studies; such experience can improve employment chances (AZVO, 2018). In March 2020 28 HEIs started implementation of the ESF funded project `Development and implementation of students' internship programmes'[61].

Internationalisation is low but growing. Learning mobility in 2018 was among the lowest in the EU (7.0% v EU 13.5%) and well below the EU benchmark of 20%. Inward mobility has grown from 0.4% in 2016 to 2.4%, albeit still among the lowest in the EU (7.8%) and with only 14.1% of incoming students coming from within the EU. Currently, HEIs report 3 007 courses in English for foreign students and more are planned. A quarter of HEIs have internationalisation strategies and 54% have special departments. Challenges include insufficient recognition of studies, administrative obstacles (recognition of prior learning, lengthy visa application and health insurance), students' standard of living, and lack of motivation, competencies and resources for teachers (AZVO, 2019).

New measures are being undertaken but face opposition. Negotiations with universities on new performance contracts have been concluded, except with the University of Zagreb which also opposed adoption of the Act on Quality Assurance in Science and Higher Education, planned for September 2020 but now halted. New equity measures will deliver at least 357 new dormitory places for low-SES students.

HEIs successfully shifted to distance education during the COVID-19 lockdown. HEIs were supported by the SRCE University Computing Centre which centrally provided software and other support[62] used by more than 70 000 students. After 8 May, activities that cannot be organised remotely, such as clinical practice, were delivered on site in small groups. From 25 May some physical classes could again be organised[63].

8. Promoting adult learning

The key challenges for adult education persist. The adult education participation rate slightly increased to 3.5% in 2019, but remains much lower than the EU average of 10.8%[64]. Insufficient funding and low interest are still challenges. Adult education financing is not comprehensive, nor part of the mainstream education system, and is in the lowest third in the EU. Some ESF projects focus on digital education of adults.

There is a need to establish a framework for assessment, provision and validation of skills aligned to labour market needs. The Adult Education Act will be adopted in September 2020: institutions will have an obligation to continuously align their education programmes with occupational standards so that participants are ready for the job market on completion. The Act lays down a CPD obligation for teachers and trainers. A major change is the recognition of knowledge and skills previously acquired from life or work, which should allow greater mobility within the lifelong learning system.

60 Eurostat, LFS: [edat_lfse_24].

61 http://www.esf.hr/wordpress/wp-content/uploads/2018/11/UP.03.1.1.04-Odluka-o-financiranju-Razvoj-unaprje%C4%91enje-i-provedba-stru%C4%8Dne-prakse-u-visokom-obrrazovanju.pdf; http://www.esf.hr/natjecaji/obrazovanje/razvoj-unapredenje-i-provedba-strucne-prakse-u-visokom-obrazovanju/

62 https://www.srce.unizg.hr/en/elc

63 https://mzo.gov.hr/UserDocsImages/dokumenti/Obrazovanje/VisokoObrazovanje/Preporuke_COVID_19_sveucilista_20_05-1.pdf

64 https://ec.europa.eu/eurostat/statistics-explained/images/2/20/Adult_participation_in_learning%2C_2013_and_2018_%28%C2%B9%29_%28%25_of_the_population_aged_25_to_64_in_the_last_4_weeks%29.png

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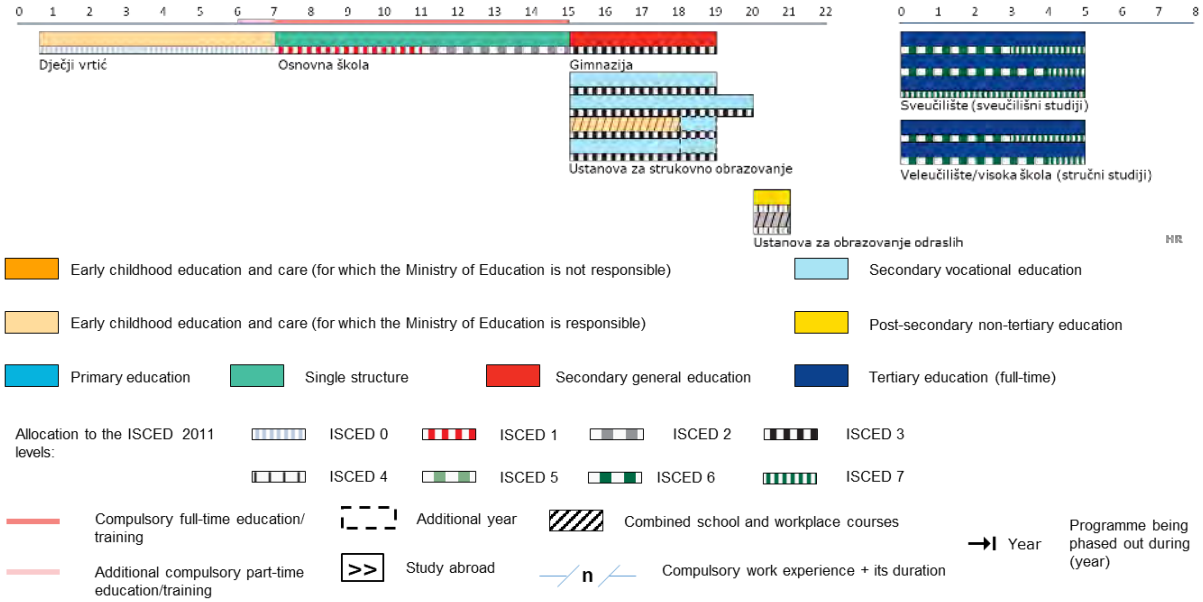
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Marina GRSKOVIC
Marina.GRSKOVIC@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

CYPRUS

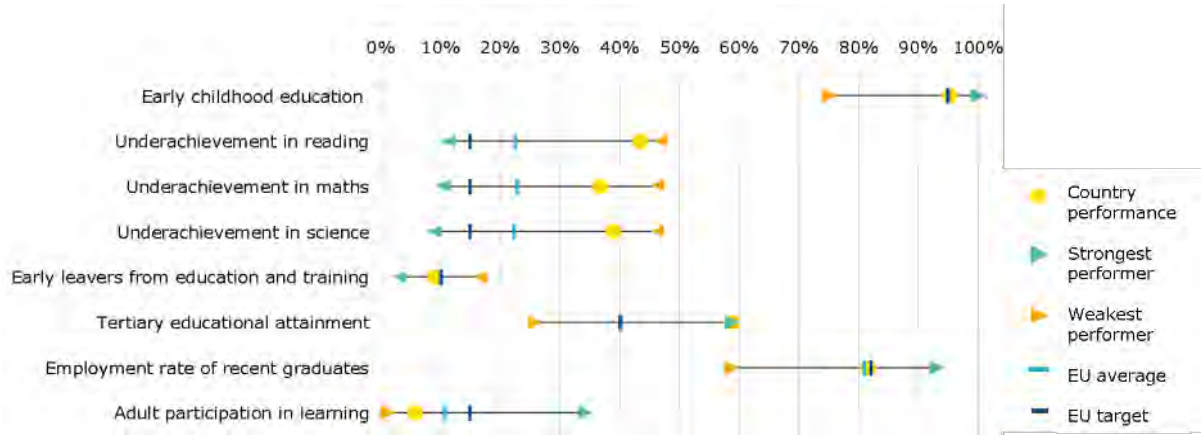
1. Key indicators

Figure 5 – Key indicators overview

			Cyprus		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			11.7%	9.2%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			45.0%	58.8%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			84.7%	95.3% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		32.8% [12]	43.7% [18]	19.3%	22.5% [18]
	Maths		42.0% [12]	36.9% [18]	22.2%	22.9% [18]
	Science		38.0% [12]	39.0% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		81.1%	81.7%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		8.3%	5.9%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	35.2% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	2.2% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		6.4%	5.2% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€8 793 [12]	€9 134 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€10 120 [d, 12]	€11 937 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€9 926 [12]	€9 854 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		7.8%	4.8%	12.6%	8.9%
	Foreign-born		23.0%	23.3%	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		49.4%	66.2%	32.0%	41.3%
	Foreign-born		36.5%	43.2%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		73.8%	72.3%	72.2%	75.9%
	ISCED 5-8		82.9%	83.9%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG Education, Youth, Sport and Culture, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series, d = definition differs, : = not available, 12 = 2012, 16 = 2016, 17 = 2017, 18=2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG Education, Youth, Sport and Culture, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Digital education is clearly a policy focus but implementation needs to be improved. Distance learning highlighted several gaps.
- Addressing underachievement and students' well-being is crucial to improve learning outcomes.
- Several initiatives in vocational education and training (VET) aim to improve labour market links, yet participation in upper secondary VET remains low.
- Employability among young graduates has risen in 2019, but health and science, technology, engineering and mathematics (STEM) graduates remain scarce.

3. A focus on digital education

Research shows a mixed picture regarding the use of information and communication technology (ICT) in education. Digital education is most prevalent at lower secondary level, where ICT is a compulsory subject with one of the highest number of annual hours (135) allocated in Europe. The OECD's teacher survey ('TALIS') shows that compared to other participating EU countries, Cyprus has a high share of lower secondary teachers (54.2%) that let students use ICT for projects or class work. However, since 2013, this share has increased much less than in other Member States (OECD, 2019d). A survey of all primary schools revealed that teachers frequently use ICT for their own preparation, but rarely integrate ICT in class. Teachers considered that the content-heavy and time restrictive curriculum was the main barrier for using ICT (Vrasidas, 2015). In the OECD Programme for International Student Assessment (PISA) 2018, a majority of principals reported a lack of incentives for teachers to integrate digital devices in their teaching (Reimers and Schleicher, 2020).

New forms of digital learning require up-to-date equipment in schools. Educators feel that schools are well equipped with digital infrastructure at both primary (Vrasidas, 2015) and secondary levels (OECD, 2019d). However, in an EU-wide comparative study, the share of schools with high provision of digital equipment (laptops, computers, cameras, whiteboards) per student and ahigh broadband speed is very low at primary (2% v an EU average of 35%) and lower secondary level (0% v 55%) and moderate at upper secondary level (55% v 72%) (European Commission, 2019a)[65]. The upgrading of infrastructure is ongoing: since 2018, 405 robots have been acquired for secondary schools to support robotics lessons (Government of Cyprus, 2020). The Cyprus Pedagogical Institute (CPI) opened a lab in 2019 equipped with the latest technologies (e.g. anthropoid robots, robotics, 3D virtual and augmented reality, 3D printing, and simulations) which teachers and students can use for hands-on activities.

There is a gap between how teachers and students perceive their own digital skills. The majority of teachers (61.8%) feel well or very well prepared for using ICT for teaching (EU average 37.5%) and only 10.8% report a high need of professional development in this area (EU average 18%) (OECD, 2019d). Slightly more than half the teachers who undertook continuing professional development (CPD) focused on ICT skills for teaching. However, given the fast-changing nature of the ICT sector, it is of concern that this share has remained unchanged since 2013. Among students, 19% of 16-19 year-olds considered themselves to have low digital skills in 2019[66] – a share above the EU average (15%) and practically unchanged since 2015. Above basic overall digital skills are reported by 36% of students - a major increase of 16 pps since 2015, but still far below the EU average (57%). High digital competence is positively linked to self-efficacy in using

[65] Overall, high-speed broadband uptake has so far been low in Cyprus.

[66] Eurostat data.

ICT for learning and has also potential benefits beyond ICT-linked learning (Hooft Graafland, 2018).

The shift to distance learning highlighted some gaps in students' digital participation. Education became remote through a mix of asynchronous (email, websites), synchronous (web-streaming) and TV provision of educational content. To ensure that disadvantaged students without access to IT equipment were not left behind, the Ministry of Education, Culture, Sport and Youth distributed 7 431 tablets across all education levels, most donated by NGOs and the Bank of Cyprus. Around 1 800 households were provided with internet connection. Limited suitable digital learning material in Greek and teachers' need to familiarise themselves with online teaching are further challenges at all education levels. Until May, more than 3 000 teachers had been trained on the use of the platforms. To better integrate ICT into education and prepare for blended forms of learning, training should eventually also focus on pedagogical aspects of digital education. A psychological framework for distance learning and active support through school counsellors helped maximise teachers' and students' success online.

Supporting teachers is crucial to ensure that digital education is beneficial. Researchers agree that the availability and integration of ICT in education is not per se beneficial for educational outcomes (Comi 2016; Bulman, 2016): pedagogy and learning design are key to unlocking its positive potential. However, comparatively few schools provide strong digital support through school strategies for the use of digital technologies in teaching and learning and strong promotion of continuing professional development (CPD): 21% at primary, 40% at lower secondary and 59% at upper secondary level (EU-28: 32%, 54% and 84%) (European Commission, 2019a). Given that CPD for teachers on ICT is more effective when delivered in school (OECD, 2019e), it is encouraging that the CPI has expanded its provision of school-based CPD in recent years.

4. Investing in education and training

Public spending on education in Cyprus remains high overall except at pre-primary level. Cyprus slightly increased its public spending on education (+2.5% in real value) between 2017 and 2018. However, relative to GDP, government expenditure decreased from 5.3% to 5.2% and, as a share of overall government spending, from 14.4% to 12%. Tertiary education accounts for 18.1% of the education budget, slightly above the EU average (16.4%) whereas the shares for pre-primary and primary (30.7%) and secondary education (35.4%) are below the EU averages. For early childhood education, public spending per student[67] is amongst the lowest in the EU[68]. Despite its sizable share in the overall education budget, public per-student spending is also comparatively low for tertiary education, reflecting the high participation in tertiary education.

5. Modernising early childhood and school education

Participation in early childhood education (ECE) has risen steadily. In 2018, 95.3% of 4-6 year-olds attended ECE compared to 85.4% in 2010. In addition, with 31.4% of children under 3 attending childcare in 2018, Cyprus has moved closer to the EU target of 33%. About two thirds of those children attend childcare for 30 hours or more per week and one third for up to 29 hours. Further increasing participation would be a good investment since high quality early childhood education and care (ECEC) is associated with long-lasting potential benefits, including improved educational attainment and social integration, higher earnings and better health (EENEE, 2018).

Reliance on informal care and private ECEC institutions remains high, especially for younger children. One third of all kindergartens are private (176/522)[69], as well as over two

[67] In PPS.

[68] Most recent values for 2017.

[69] Cystat data for 2017/2018.

thirds (153/223) of nurseries[70]. Access to private facilities is closely linked to affordability. For under 3 year-olds, 27.9% of parents relied on full-time (over 30 hours a week) childcare by grandparents, other household members, other relatives, friends or neighbours – the second highest share of informal arrangements after Greece. In addition to informal settings, regulated home-based childcare also exists. Childminders can take up to six children (up to three if below 2 years), but no minimum qualifications or specific training is required (European Commission, 2019d).

ECEC provision for under 3 year-olds in rural areas is insufficient. If they exist at all, ECEC facilities in rural areas for the very young are mostly private. This leads to people relocating to cities or to prevalent inequality for families in those areas. There is currently no mapping of demand/supply needs for ECEC. Investment to upgrade infrastructure is insufficient, particularly in small villages and socially disadvantaged areas. A growing awareness of the problem is demonstrated by a recent proposal for revitalisation of the mountainous Troodos region, which includes plans for ECEC facilities.

Early school leaving (ESL) is on the rise. Among 18-24 year-olds, 9.2% were early school leavers in 2019, up from 7.8% in 2018 and just below the Europe 2020 national target (10%). While ESL values in Cyprus are somewhat volatile due to a small sample size, there appears to be an upward trend since 2015, when ESL was at its lowest at 5.2%. This is primarily caused by a strong increase among foreign-born students, whose ESL share went up 9.4 pps to 23.3% from 2018 to 2019 while the share decreased among native-born to 4.8% (-1.4 pps). Since 2016, immigration to Cyprus has increased again, in particular the number of asylum seekers. Structural drivers of ESL in Cyprus appear to include insufficient flexibility and permeability within education programmes (European Commission, 2019b). Individualised diagnostic tests to better support disadvantaged students could help prevent ESL (ibid.). Truancy in Cyprus is also higher than the EU average. In PISA 2018, one third of students reported to have skipped a whole day, 43% some classes, and 68% had arrived late in the 2 weeks prior to the PISA test (OECD, 2019c).

Box 1: EU funds support prevention schemes for early school leaving

In 2014-2020, the European Social Fund (ESF) supported the 'Actions for social and school inclusion (DRA.S.E.)' programme, which helped reduce early school leaving, improve learning outcomes and tackle delinquency among disadvantaged children, including recently arrived migrants.

DRA.S.E. is a comprehensive programme comprising morning and afternoon activities, as well as after school lessons, to reinforce various subjects (Greek language, maths, physics, chemistry, computer science, economics etc.). DRA.S.E. also offers programmes for personal development and helps students develop social skills through theatre, art, sports, dance and music. Psychological support is also offered to students and parents. At present, about 15% of the student population is participating in 96 pre-primary, primary, secondary, and vocational schools. The programme's total budget is EUR 29 million, of which 85% is contributed by the ESF.

Other measures to support disadvantaged children include a free breakfast programme (also co-funded by the ESF) to ensure that the most vulnerable pupils receive a daily nutritious breakfast.

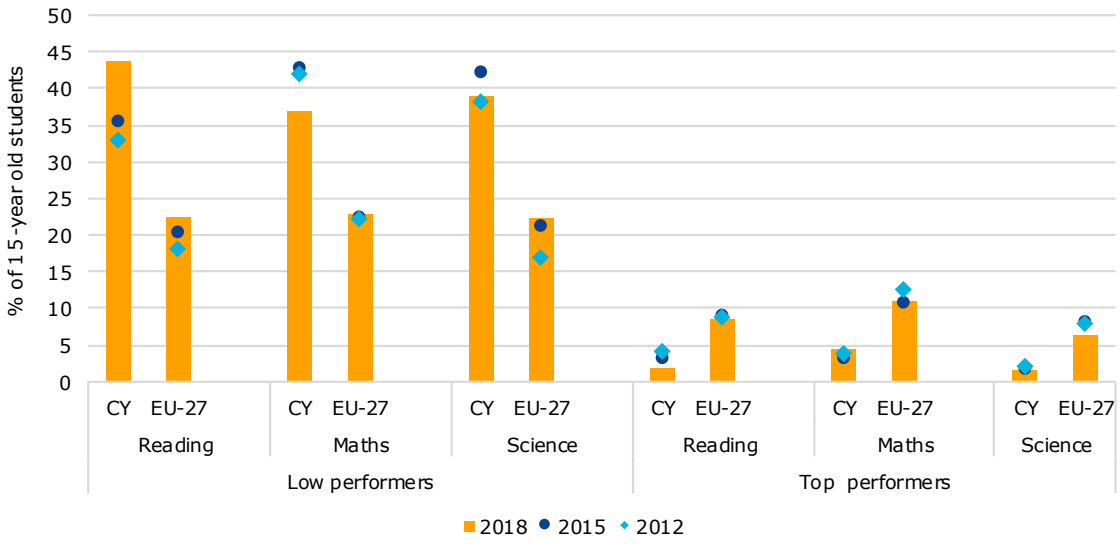
Under the European Commission's structural reform and support programme, Cyprus is also currently implementing a project to address students' disengagement and dropout from secondary school, to be completed by April 2021.

https://www.structuralfunds.org.cy/Drase

[70] Nurseries are the Ministry of Labour's responsibility and open to children under 3 whereas kindergartens are the Ministry of Education's responsibility and cater to 3-6 year-olds.

The basic skills levels of Cyprus' students lag behind those of other EU countries. Performance among 15 year-olds in Cyprus, as measured in PISA 2018, remains far below the EU average. Since 2015, Cyprus has managed to reduce the share of low achievers in both maths (-5.7 pps) and science (-3.2 pps) to 36.9% and 39% respectively. Despite this positive trend, Cyprus trails behind other EU countries in maths and science (average share of low achievers in EU-27 = 22.9% and 22.3% respectively). The share of low achievers in reading has risen by 8.1 pps since 2015, the biggest increase in the EU. Some 43.7% of pupils had difficulties with texts of moderate length and complexity or with unfamiliar material. The share of top achievers has also decreased. Students in vocational programmes also significantly lag behind those in general programmes. Their reading performance is 109 score points lower, comparable to around 3 years of schooling. The large gender gap in reading is also a concern: girls outperform boys on average by 47 score points, corresponding to more than 1 year of schooling (EU-27 average: 28 points). More than half of all boys are underachievers in reading compared to 1 in 3 girls, the widest gap in the EU.

Figure 3 - Low and top performers in reading, maths, science between 2012 and 2018



Source: OECD (2019), PISA 2018. Note: The EU-27 averages for reading do not include ES results.

Addressing underachievement at all levels is crucial. Almost 2 out of 3 students (58.9%) from the lowest socio-economic quartile are low achievers in reading (EU average: 36.4%). In the top socio-economic quartile, 29.7% are low achievers, the highest share in the EU (where the average is 9.5%). These findings underline the need for policies that tackle underachievement across the socio-economic spectrum while maintaining and strengthening specific support for disadvantaged groups.

Improving students' well-being could boost learning outcomes. One student in 3 reported being bullied at least a few times a month and attend schools where bullying is prevalent. Low achievers are much more exposed to frequent bullying than high achievers (54.6% v 21.1%). Socio-economic status or migrant background do not appear to be significant triggers for bullying, in contrast to gender: a much higher share of boys (40.9%) than girls (27.2%) report being frequently bullied. Boys also appear to be more accepting of bullying. Given the marked gender gap in reading performance noted above, it is noteworthy that being bullied at least a few times a month is associated with a poorer reading performance – equivalent to more than 1 year of schooling[71]. Cyprus has in place a policy framework against violence and racism at school, but educators sometimes lack awareness about what constitutes violent behaviour.

[71] Difference of 48 score points after accounting for socio-economic background.

Education reforms have slowed down. To achieve better learning outcomes, Cyprus has taken a comprehensive approach to modernising its education system. A new procedure for teacher appointment based on competitive exams was installed in 2017. A unified system for student evaluation provides for more formative assessment of students, and biannual exams in secondary education have replaced annual exams to allow for earlier remedial intervention if necessary. The introduction of more frequent exams was opposed by teachers and students who fear a heavier workload and implementation has stalled due to the pandemic. A proposal for teacher evaluation was submitted in early 2019 but since then stakeholder discussions have stalled. Since 2016, curricula across all levels have been revised to better reflect intended learning outcomes. However, an evaluation found a mismatch between content and assigned teaching time for some subjects, including maths and science. In addition to the persistent heavy content load of the curriculum, centralised CPD of teachers does not sufficiently respond to teachers' individual needs to master the new curriculum (Xenofontos, 2019). Therefore, pilot programmes by the CPI to implement school-based CPD should be scaled-up.

Box 2: Survey sheds light on school culture in Cyprus

According to further qualitative insights from the 2018 OECD Teaching and Learning International Survey (TALIS), schools in Cyprus have comparatively low pedagogical autonomy. In Cyprus' centralised education system, almost no administrative decisions at public schools, such as appointing or suspending teachers, determining salaries or allocating budget, are taken by school principals (OECD, 2019d). Regarding pedagogical autonomy, TALIS shows that within the expected margin of autonomy that even a centralised system offers, Cyprus also scores very low. The share of school principals who report autonomous decisions on learning material, course content and offers is the lowest of all 22 EU participant countries in TALIS (OECD, 2019d). However, teachers perceive their pedagogical autonomy as being on par with decentralised systems, suggesting contentment with their room for manoeuvre. Research suggests that increased autonomy over academic content impacts positively on student achievement whereas personnel and budget autonomy produce smaller effects (Hanushek et al., 2013).

Collaborative teaching is also not common. Only 6.4% of teachers report teaching as part of a team at least once a month, compared to 28.2% in the EU-22 (OECD, 2019d). Engaging in joint activities across classes or observing other teachers in class and providing feedback is similarly rare. Collaboration is however more widespread than in most EU TALIS countries as regards exchanging teaching material, debating student progress and assessment, and attending team conferences. Participation in collaborative professional learning is similarly low (12.9%) as in other EU countries. Research shows that collaboration among teachers, in particular for teaching and training is one the most effective practices for improving teaching quality and learning outcomes (OECD, 2019e).

Sustained efforts are necessary to integrate students with a migrant background. In the last 3 years, Cyprus has emerged as one of the Mediterranean destination countries for asylum seekers. In 2019, 12 724 new asylum applications were launched, up 65% from 2018. The top 10 countries of origin are Syria, Georgia, India, Bangladesh, Cameroon, Pakistan, Egypt, Vietnam, Nigeria and Sri Lanka (UNHCR, 2019b). Since 2016, 1 249 unaccompanied children have applied for asylum, 549 in 2019 (UNHCR, 2019a). Preparatory afternoon classes for unaccompanied minors were created in three state institutes for further education in Limassol and Larnaca. Work on several recommendations stemming from a European Commission-supported peer counselling on integrating students with a migrant background has started but reception, language teaching and curriculum-setting is delayed due to the pandemic. Providing support for students with a migrant background has proven challenging during the COVID-19 school closures. Teachers reported difficulties reaching non-Greek speaking students (FRA, 2020). Intensified integration efforts upon return to school could help mitigate the risk of a widening gap with native-born students.

Competences for environmental sustainability are part of school education. At pre-primary, primary and secondary levels, schools cover environmental and social topics. Environmental programmes include teaching on global warming, climate change, energy, urban

development, and means of transport. Since 2007, the national strategic plan for environmental education has been monitored and upgraded every year. Schools can also join the Network of Environmental Education Centres - the body that coordinates environmental education and sustainable development in formal and non-formal curricula. Operated by the Ministry of Education, Culture, Sport and Youth, this network cooperates with government services, universities, research centres and NGOs to help integrate environmental issues in school curricula, in education and training of teachers and education executives as well as in field research.

6. Modernising vocational education and training

Measures to improve attractiveness of VET have increased student numbers over recent years but participation in upper secondary VET remains low. In 2018, 16.7% of upper-secondary students were enrolled in VET, the lowest in the EU and well below the EU average (48.4%). Students had limited exposure to work-based learning. Employers' engagement in VET has increased, and measures have been taken to ensure skills relevance in the sector, including tracking graduates on placement schemes and cooperation with industry on curriculum development.

Initiatives to improve labour market links are under way. To set up a national monitoring system for initial VET and continuing VET graduates, a platform is currently being piloted for initial VET graduates. It aims to facilitate communication between initial graduates of secondary VET and of post-secondary, higher VET institutes and potential employers (Cedefop, 2020b). In 2019, the Youth Board of Cyprus set up a career guidance service offering: (i) personalised career guidance; (ii) skill testing (a tool to help lower secondary students decide on their further education); (iii) workshops to develop soft skills; and (iv) two-day 'Career Academies', i.e. lectures and workshops on career choice, job search, career development and more specialised topics (Cedefop, 2020a).

VET adapted to the COVID-19 mobility restrictions. Final VET exams were cancelled. The Human Resource Development Authority updated the policy and procedures guide for distance learning ('Utilising E-Learning methods in training programmes'), which entered into force in March 2020. As well as responding to the COVID-19 threat, the guide pushes for faster adoption of ICT in VET (Cedefop, 2020c).

7. Modernising higher education

Tertiary educational attainment is high and rose further. In 2019, 58.8% of 30-34 year-olds in Cyprus had obtained a tertiary degree, the highest share in the EU (41.6%). Cyprus also includes as tertiary students those that follow VET programmes – about one third of all enrolled students. A large gap of 23 pps in tertiary attainment exists between native-born and foreign-born, whose attainment level is nonetheless high (43.2%). Similar to basic skills levels, there is a significant gender gap in tertiary attainment: 68.2% of females have a tertiary degree compared to 49% of males.

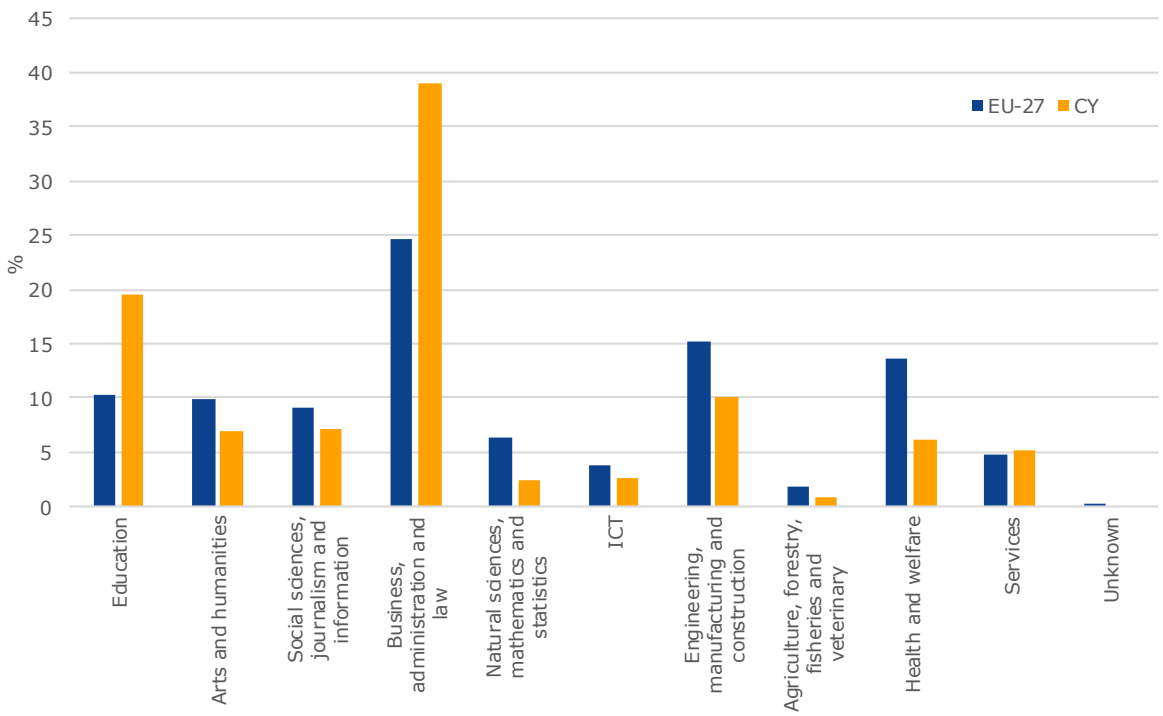
Employability among young graduates has risen in 2019 but is likely to be impacted by the COVID-19 crisis. The employment level of 20-34 year-olds with tertiary education was 83.9% in 2019, only slightly below the EU average of 85.3%. While tertiary education clearly offers the best opportunities for employment in Cyprus, young people with secondary education fare comparatively well, as 72.3% had a job compared to the EU average of 76.4%. As Cyprus' economy strongly relies on tourism and services, temporary business closures during the pandemic are likely to affect overall employment levels, including those of recent graduates who have the least work experience.

Cyprus produces fewer health and STEM graduates than most EU countries. At 6.2% Cyprus had in 2018 the lowest share of health graduates in the EU while 19.6% graduated in education and 39% in business, administration and law. So far, the Career Counselling and Educational Services under the MOECSY have not specifically promoted medical education. The share of STEM graduates was at 15% also very low compared with the EU average (25%) in 2018.

Only 2.7% of graduates obtained a degree in ICT (EU average: 3.6%). New green jobs are expected to be created mostly in manufacturing, construction, services, waste management and sustainable finance (European Commission, 2020). The need for digital skills and solutions, highlighted during the COVID-19 mobility restrictions, together with the greening of the economy requires a reinforced focus on STEM profiles.

Better intelligence on skills utilisation can reduce skills mismatches. The discrepancy between labour market needs and young people's study choices could be reduced by comprehensive graduate tracking. However, at present this is lacking at both system and provider-level for tertiary education which produces most graduates in Cyprus. Initial steps have been made to track IVET graduates and a pilot is carried out with the two biggest public universities to track graduates of the previous five years. However, collecting information on skills utilisation in the labour market and placement rates for policy-making and career counselling needs to be further expanded and systematised. In 2020, Cyprus received a country-specific recommendation to improve labour-market relevance of education and training (Council of the European Union, 2020).

Figure 4 - Distribution of tertiary graduates by field of education, 2018



Source: Eurostat, UOE: [educ_uoe_grad03].

8. Promoting adult learning

Skills provision among adults is slow to improve. Participation in adult learning (25-64) remains low at only 5.9% in 2019, compared to the EU average of 10.8% and has further decreased compared to the previous year (6.7%). This is partly due to the low attractiveness of the learning environment. Most providers require learners' physical presence and use pre-fixed programmes providing little space for adjustments to meet learners' individual needs. So far, no tools for validation and accreditation of prior learning exist.

Educational support and tracking in adult education is underdeveloped. In September 2019, a new model of evening secondary schools and evening technical schools was introduced to

increase the attractiveness of the two programmes and bring more low-skilled adult learners to education. However, Cyprus lags behind other EU countries in lifelong learning counselling and monitoring mechanisms for the professional and educational careers of learners, especially those belonging to vulnerable groups. This applies to all types of adult education (basic skills, second chance and VET). In addition, online adult learning opportunities are limited so far.

Despite many initiatives to improve adults' digital literacy, digital skills remain below the EU average. The lifelong learning VET programmes provide digital skills courses and also job-related courses. The Human Resource Development Authority offers training in digital literacy for the unemployed and for employees in the private and the public sectors (Cedefop, 2020a). The Cyprus Productivity Centre offers courses on e-government systems and on basic digital skills, while the Cyprus Academy of Public Administration trains public service staff for the transition to e-government. However, in 2019 only 45% of adults aged 16-74 declared to have basic or above basic overall digital skills (EU-27 average: 56%).

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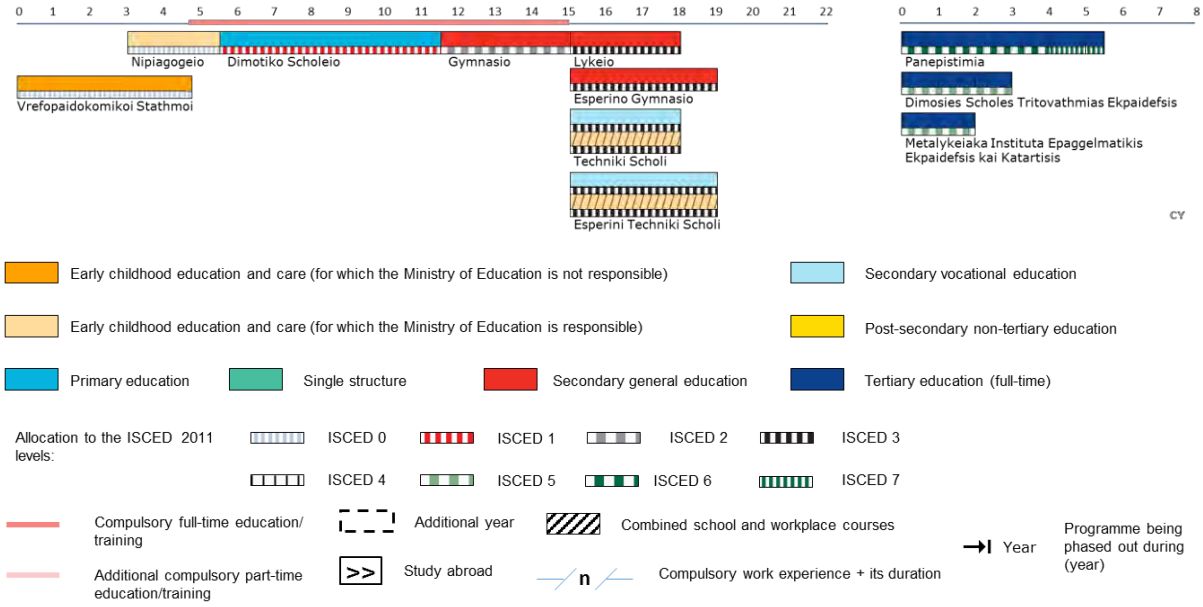
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Ulrike PISIOTIS
Ulrike.PISIOTIS@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

CZECHIA

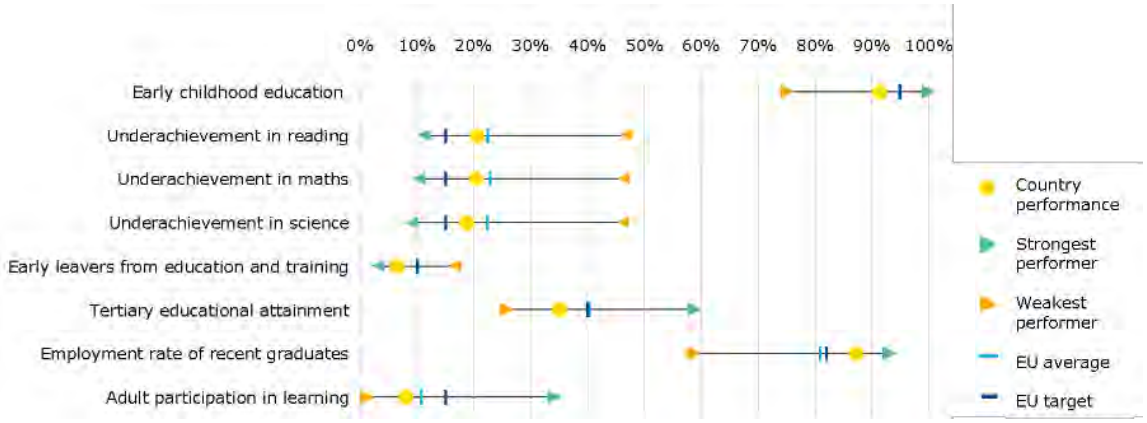
1. Key indicators

Figure 6 – Key indicators overview

			Czechia		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			5.4%	6.7%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			17.5%	35.1%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			90.6%	91.5% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		23.1%	20.7% [18]	19.3%	22.5% [18]
	Maths		22.4%	20.4% [18]	22.2%	22.9% [18]
	Science		17.3%	18.8% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		84.5%	87.3%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		7.1%	8.1%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	5.0% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	9.0% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		5.1%	4.6% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€4 629 [12]	€5 308 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€5 191 [12]	€6 346 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€7 726 [12]	€7 998 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		5.2%	6.7%	12.6%	8.9%
	Foreign-born		15.0% [u]	8.3% [u]	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		17.1%	34.2%	32.0%	41.3%
	Foreign-born		31.5%	48.8%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		81.7%	86.1%	72.2%	75.9%
	ISCED 5-8		89.0%	88.2%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG Education, Youth, Sport and Culture, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs, u = low reliability, : = not available, 12 = 2012, 16 = 2016, 17 = 2017, 18=2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG Education, Youth, Sport and Culture, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Digital education is a clear policy focus. Distance learning was set-up fast and efficiently but also highlighted existing gaps.
- Provision of early childhood education and care services is insufficient, especially for younger children.
- Czechia maintains a good overall performance in education, but socio-economic inequalities are pronounced. Shortage of teachers also present a challenge.
- Increasing participation in adult learning remains crucial, especially for low-skilled adults.

3. A focus on digital education

Digital education receives considerable policy attention but implementation is uneven. Czechia has in place a comprehensive digital education strategy. Its implementation is underpinned by EU Structural and Investment Funds (ESIF), which support financing of ICT equipment at schools, measures to revise curricula by integrating digital learning and the development of digital educational resources (see box 1). In its digital education implementation review of 2011-2018, the Czech Supreme Audit Office criticised the lack of sustainable long-term financing, the absence of defined digital competences for pupils and insufficient training and resources for teachers (SAO, 2019). The Ministry of Education has intensified efforts to provide digital education, reinforced by the urgent need to use distance learning during the COVID-19 crisis. In addition, digital education is subject to quality assurance: Czechia is one of the few EU countries that includes testing of digital competences of pupils for school evaluation purposes (European Commission, 2019a).

Shortcomings remain regarding more recent ICT technology at schools. In 2018, only 6.4% of school principals perceived connectivity problems as obstacles to quality instruction, but almost one in four (23.5%) reported shortages or inadequacies of digital technology (OECD, 2019b). Most schools face challenges with regard to fast-evolving digital technology - 73% of school computers are between three and nine years old (SAO, 2019). The OECD Programme for International Student Assessment (PISA) 2018 confirmed a relatively low availability of technical support at schools (OECD, 2019a). The Ministry of Education cooperates with the Ministries of Industry and Trade and of Regional Development to identify and address any gaps in schools' IT infrastructure and to ensure timely IT provision and replacement.

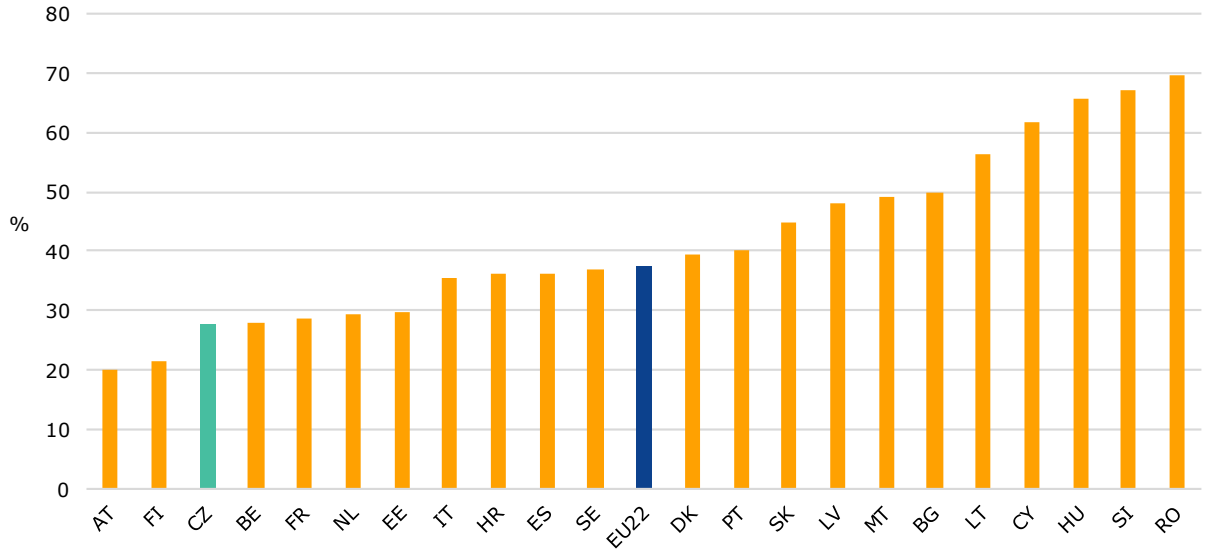
Distance learning during mobility restrictions was set-up fast and efficiently but also highlighted existing gaps. To facilitate distance education, the Ministry of Education created a web portal offering access to online resources for teaching and learning. While the majority of primary schools engaged in asynchronous teaching by sending assignments electronically, secondary schools applied a combination of live and asynchronous teaching. Educational TV was also available. However, not all children were able to participate equally as 3.3% of children aged 6-15 were without internet and 5% who had internet, lacked devices. About 9 500 primary and secondary students did not participate in education during the lockdown. The situation was most problematic at vocational schools (CSI, 2020a).

Teacher training on digital education is below EU average and mainly focused on ICT applications. In Czechia, only 27.7% of novice teachers feel well prepared to include ICT in their teaching. This share rises to 56.3% over a five year span, indicating the impact of continuing professional development (CPD) – while less than half (44.5%) of novice teachers covered ICT during their studies[72], 74.8% did so by the end of their first five years in the profession (OECD, 2019b). It is however of concern that overall the share of teachers who covered ICT skills in their CPD decreased from 53.4% in 2013 to 41.1% in 2018. A 2019 survey confirms lower levels of ICT

[72] This proportion should rise as since 2017 ICT is mandatory in initial teacher education.

training among Czech teachers than the EU average, except for equipment-specific training for primary and lower secondary teachers (European Commission, 2019a), reflecting the curriculum's main focus on technology use. In 2018, only 13% of teachers felt a high level of need for ICT training (OECD, 2019b), which points to the limited ICT application in the classroom rather than advanced ICT competences among teachers. It is encouraging that Czechia has launched a framework of digital teacher competences, defining 22 competences in six areas (NRP, 2020).

Figure 3 - Percentage of lower secondary teachers who felt `well prepared´ or `very well prepared´ for the use of ICT for teaching, 2018



Source: OECD (2019), TALIS 2018.

Czech teachers' willingness to use digital technologies has improved in the crisis. Before COVID-19, teachers' appetite for ICT was rather low: only one third of teachers let students frequently use ICT for projects or class work, compared to 46.9% among the other 22 EU countries participating in TALIS (OECD, 2019). ICT is frequently limited to the teaching of informatics, foreign languages and natural sciences (SAO, 2019). Survey data on distance learning provision revealed that parents perceived the low level of technological preparedness and teachers' lack of knowledge and skills as major hurdles. However, two thirds of schools expect that most teachers will take up more digital technology in class after the return to school (CSI, 2020a).

Students' digital activity and skills are impacted by the out-of-school digital context. In 2017, only 11% of individuals aged 16-19 considered their digital skills to be low compared to 15% at EU level, whereas 52% reported having above basic overall digital skills (EU average: 57%)[73]. Czech children aged 9-16 are comparatively active online, spending more than two hours per day on the internet (EU Kids online). Greater online presence increases the amount of online activities but also the associated risks; childrens' skills to critically evaluate information are typically among the least developed, including in Czechia (Smahel et al., 2020). It is thus positive that curricular reform efforts aim to broaden digital education beyond understanding and usage of technology to include competences such as critical thinking, problem solving, data literacy, safety, flexibility, communication (European Commission, 2019b). The current deadline for revision of the curriculum regarding digital education is September 2021.

[73] Eurostat data.

Box 1: The European Social Fund help develop computational thinking in Czechia

The Czech Digital Education Strategy up to 2020 (DES), approved by the government in 2014, has been largely financed through the European Social Fund (ESF).

For the PRIM project (Podpora rozvoje informatického myšlení – Support of development of computational thinking), running until September 2020, ESF has contributed CZK 88.7 million to the overall budget of CZK 109.8 million (EUR 4.1 million). The project, which is implemented by the University of South Bohemia in České Budějovice in cooperation with eight other universities and the National Pedagogical Institute, targets all school grades from kindergarten to secondary level. The main goal is to change from a purely user-oriented approach to include the basics of computer science, by developing educational material for children but also for pre-service and in-service teacher training. The projects has received the prestigious Czech education prize *Eduina*.

https://www.imysleni.cz/about-the-project

4. Investing in education and training

Spending on education has increased but remains low at pre-primary and primary level. Education expenditure as a share of GDP was at EU-27 average (4.6%) in 2018, marking a 12.5% increase in real terms from 2017. Czechia dedicated 11.4% of its overall budget to education, above EU average (9.9%). Spending increased most for tertiary education (24.7%) followed by secondary and post-secondary non-tertiary education (13.1%) and pre-primary and primary education (8.3%). Overall, Czechia spent most on secondary education and post-secondary non-tertiary education (44.5%), followed by pre-primary and primary education (23.7%) and tertiary education (17.5%).

The reform of regional education financing entered into force. With a year's delay, the new funding system became operational as of January 2020. Schools received their budget, increased by CZK 20 billion. Funding is now based on hours taught and pedagogical work instead of the number of pupils attending a school. This should allow for fairer allocation because regional differences or diverse student populations, including those with special needs, can be better taken into account.

5. Modernising early childhood and school education

Capacity problems impede participation in early childhood education (ECE). In 2018, 91.5% of children aged 4-6 attended ECE compared to 94.8% at EU-27 level. Participation among Roma children is much lower (estimated 34% in 2016). Regional differences point to capacity problems: the region of Prague, despite being most populated and economically advanced, has the second lowest attendance rate. For under 3 year olds, Czechia recorded, with 9%, among the lowest participation levels in the EU (34.7%). To reach the EU target of 33% children under 3 in childcare, more than 50 000 additional places would be needed according to a national survey. However, to meet Czech parents' (lower) demand, an additional 20 000 places would suffice. According to findings of the Czech School Inspectorate, many preschools involved parents in pedagogical projects and thus intensified parents' interest in preschool education and contributed to their understanding of ECE as not being childminding but of key importance for the education and development of their children (CSI, 2020b).

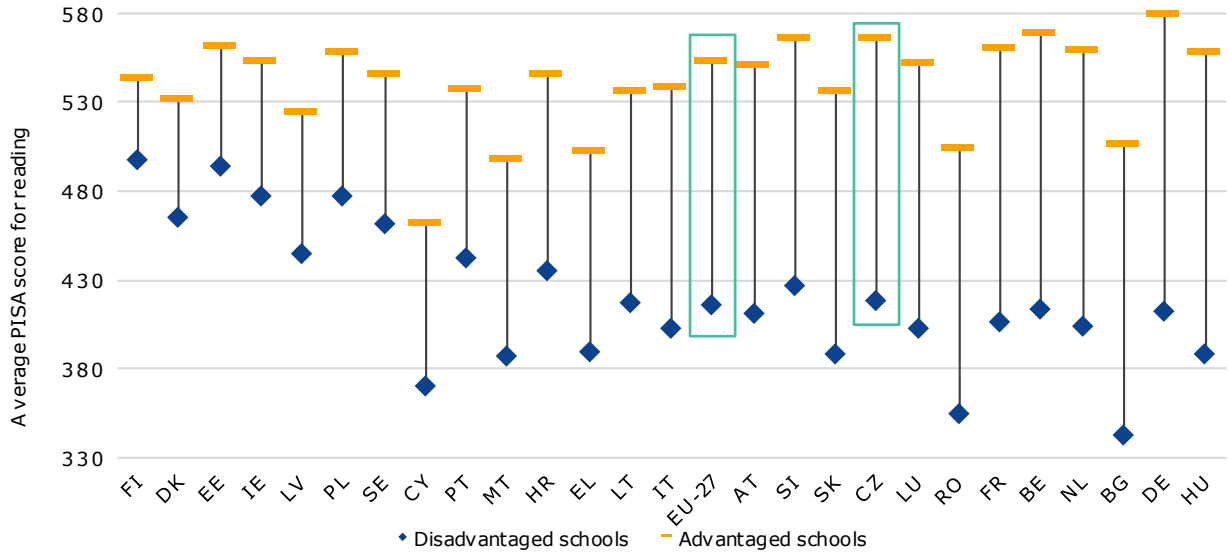
Fragmented provision and unequal working conditions impact on quality of ECE for under 3 year-olds. As the guarantee to publicly subsidised ECE starts only at age 3, a childcare-gap of two years exists after childcare leave. ECE provision for this group is underdeveloped and fragmented: three different ministries oversee various services. Due to the lack of places, parents often turn to informal or private solutions (Eurydice, 2019). Kindergartens (which admit 2 year-olds) have less favourable child-to-adult ratios and less funding than children groups catering for the same age. The minimum qualification level required to work as a core practitioner is below

bachelor's level across the entire age span of ECE, but only staff working with older children have a professional duty of continuing professional development (Eurydice, 2019). Research shows that ECE quality is affected by the level and duration of staff's initial training as well as by their job satisfaction and retention. To improve the latter, several factors come into play, including low child-to-staff ratios and low group size, competitive salaries and competent and supportive managers (OECD, 2017).

Czechia maintains a good overall performance in education. The performance of 15-year-olds in the OECD Programme for International Student Assessment (PISA) 2018 was slightly above the EU average for all three areas tested (reading, mathematics and science) and the proportions of low-achievers below the EU average[74]. Compared to 2009, the proportion of low achievers in reading has remained stable, while the share of top-performers has increased by 3.1 pps to 8.2%, albeit still below the EU average. Students in vocational programmes perform practically at the same level as those in general programmes, which is positive given that one third follows vocational programmes.

Socioeconomic inequalities are pronounced. Among students from disadvantaged background 37.7% are underachievers in reading, but only 8% from advantaged backgrounds are – a gap above the EU average (26.9 pps). Disadvantaged and advantaged students are concentrated in different schools to a higher extent than on average in the EU – a performance difference of 148 score points corresponding to about three years schooling separates disadvantaged from advantaged schools. Socioeconomic disparities also manifest themselves in career expectations: while 87.4% of advantaged students expect to complete tertiary education, only 36.6% of disadvantaged do – one of the largest gaps in the EU.

Figure 4 - Reading performance difference between advantaged and disadvantaged schools, PISA 2018



Source: OECD (2019), PISA 2018.

Research confirms that performance gaps of different school types are mainly based on school-external factors. A recent longitudinal study shows no difference in students' progress between grades 6 and 9 for mainstream basic schools and multi-year gymnasia which are attended by approximately 12% of students, mainly from well-off households. Diverging average achievement and attitudes of students reflect the selectivity of multiyear-gymnasia and early

[74] See Figure 1.

tracking by ability, rather than superior school quality (Greger et al., 2020; Martinková et al., 2020). This is also demonstrated by the PISA isolation index, which is the highest for Czechia regarding the concentration of high performing students. The school closures during COVID-19 have sharply brought into focus performance and even participation differences in distance learning, based on parental support or the lack of it. Apart from infrastructure difficulties, disadvantaged schools grappled with scant parental input, which exacerbated existing inequalities. One of the lessons learnt for school principals has therefore been to improve communication with parents (CSI, 2020a).

In addition to socioeconomic profile, school location is a major determinant of performance. Geographical disparities are significant with schools in rural areas trailing city schools on average by 67 score points, the equivalent of almost two years of schooling. Czechia has reformed the school financing system to ensure that financial contributions cover the real needs of schools. The future Strategy for Education 2030 aims to reduce inequalities by supporting teachers and school heads and transforming the content and methods of education.

Early school leaving (ESL) remained broadly stable yet still above the national target. The overall share of 18-24 year old with at most lower secondary education was 6.7% in 2019 compared to 6.2% in 2018. While well below the EU average (10.2%), it remains above the national Europe 2020 target (5.5%). ESL is also much higher among vulnerable groups, including Roma: the rate for Roma was estimated at 57% in 2016 (FRA, 2016).

Pay levels and public image affect the attractiveness of the teaching profession. The 2018 OECD Teaching and Learning International Survey (TALIS), revealed that while the great majority of teachers in Czechia (91.2%) enjoy working at their particular school, only 16% consider their profession valued by society (OECD, 2019). Comparatively low salaries, which might contribute to this perception, are a cause of discontent for 72% of teachers, a share significantly above the other 22 EU countries participating in TALIS 2018 (61.9%). For teachers with drop-out intentions, it may well be decisive for their decision whether to simply change school or leave the profession altogether (Hanušová et al., 2020). In 2018, actual salaries for teachers remained significantly below those of tertiary-educated workers (OECD, EAG country note 2019) and showed modest and slow progression from starting to top salary compared to other EU countries (Eurydice, 2019; OECD, EAG country note 2019). Czechia has pledged to increase salaries of teaching and non-teaching staff to 150% of their 2017 levels.

Box 2: Entry into the teaching profession will be easier to tackle shortages

To mitigate serious teacher shortages, the law on pedagogical staff was amended, lowering qualification requirements. School leaders' assessment would replace the (a priori) teaching qualification. Primary teachers will be able to enter the profession with a degree in pre-primary education or in leisure time pedagogy, i.e. without training in early literacy and other primary-education-related content.

In secondary education, out-of-field teaching is growing: the proportion of classes taught by specialists in the subject has decreased (CSI, 2019). In some subjects (foreign languages, IT, art) it is more than 50% and even for maths (33%) and Czech language (25%) it is quite high. A comparison by the Czech School Inspectorate on the quality of teaching between teachers with and without qualification and between teachers teaching in their specialization or out of field showed that qualified teachers had more thorough and elaborated teaching units, and offered fewer monotonous teaching units (CSI 2018).

Working conditions are demanding: in primary education, one teacher is in charge of, on average, 19.2 pupils compared to 14.1 at EU level. Average class size has increased. The share of older teachers has also increased in the past decade: 44.3% of teachers are over 50 years old (43% in primary education and 52.7% in upper secondary) above the EU average (38.8%). Joint teaching, observing other teachers' classes and providing feedback as well as joint activities across different classes and age groups are rare. Only around 7% of teachers engage regularly in such actions (OECD, 2019b) even though teacher collaboration is found to be especially beneficial for job satisfaction but also for improving educational outcomes (OECD, 2019c).

Collaboration for assessment, training or exchange of teaching material is however much more common.

Stakeholder reactions to the changed recruitment requirements are mixed: a generally positive media echo from NGOs and some school heads contrasts with a more negative view by education specialists (deans of education faculties) who share concerns about de-professionalisation of the teaching profession and quality loss at schools.

More children with special needs attend mainstream education but conditions to support them are difficult. The proportion of students with special education needs in mainstream education increased from 9.5% in 2016/2017 to 12.8% in the 2018/2019 school year. At the same time, the framework for support of inclusive education has been tightened: in addition to large class sizes (in cities around 30 children), an amendment to the education act in force since January 2020 limits the number of teaching assistants in regular classes to two (previously three were allowed) and deleted the provision stipulating that students with disabilities shall be primarily educated in mainstream schools.

Targeted support for inclusive education is envisaged. The prevalence of segregated schools with a large majority of Roma pupils reflects the concentration of Roma in socially excluded locations but also the reluctance of non-Roma parents to accept Roma pupils in their children's schools (CERD, 2019). While not specifically mentioning Roma, the strategy document Long-Term Education and Training Scheme 2019-2023, published in November 2019, emphasises the need to avoid segregation of pupils at elementary schools. To reduce disparities in education in all regions, in particular in socially excluded locations, higher participation of children from such locations in ECE, better allocation of highly qualified teachers and better cooperation with social workers and other public actors are considered necessary (Ministry of Education, 2019). Discrimination of Roma children in education is a subject of an ongoing infringement process.

6. Modernising vocational education and training

Participation in VET remains well above the EU average despite a slight decline. The total enrolment in upper secondary VET in Czechia continued to decline from 72.4% in 2017 to 71.3% in 2018 staying however well above EU average (48.4%). The employment level of recent VET graduates remained at 86.8%, also higher than in other EU countries (79.1%) despite a slight decrease compared to 2018.

Several measures have been introduced to increase the labour market relevance of the VET system. A labour market barometer was developed for regular monitoring and projections of labour market developments. The barometer will be incorporated into active employment policies but concerns remain about its sustainability following the pilot phase (Cedefop ReferNet Czechia, 2020). Exams leading to a master craftsman qualification are expected to start in 2021. Piloting of exams for 20 qualifications started in 2019. The new National Pedagogical Institute is, in addition to general education and other areas, responsible for VET, further education, career guidance and counselling, and the link between education and the labour market. It also manages the National Qualification Framework. The recently introduced new system of regional education funding also concerns VET.

Distance learning was more difficult in VET education. National data revealed that, during the Covid-19 crisis, only about one fourth of upper secondary VET schools providing mainly a VET final examination (without the general education Maturita examination) managed to engage all students online and one fifth of their students did not participate at all. In contrast, more than half of VET schools providing education leading to *Maturita* managed to involve all students online and only one eight of their students could not be reached. School principals attribute this to the lack of motivation combined with low parental support (CSI, 2020a). Providing practical education content online might also have been more challenging than academic content. However, some VET students were involved in voluntary work in their professional line (medical, educational activities) during the epidemic, thus further improving their practical competencies.

7. Modernising higher education

Tertiary educational attainment varies considerably between regions and groups. Among 30-34 year old adults, 35.1% had a tertiary qualification in 2019 compared to 40.3% at EU level. The average attainment rate, which increased by 17.4 pps over the last 10 years, hides various differences, notably a gender gap of 11.5 pps (EU: 10.5%) between 41% of women with tertiary educational attainment and 29.5% of men. The proportion of foreign-born in Czechia with tertiary educational attainment is, at 48.8%, considerably higher than those of native-born (34.2%) due to the economy's attractiveness for highly qualified foreign workers. Regional differences range from 60.9% in the capital region to 20.8% in the northwest. A new law, passed in response to the COVID-19 crisis, enables higher education institutions to change the length and the organisation of the academic year, including scheduling exams during the summer vacation.

Employability of recent tertiary graduates remains high. In 2019, 88.2% of 20-34 year-olds having graduated at tertiary level in the last three years were in employment. Thus, having a tertiary degree is slightly advantageous in the overall strong Czech labour market. The transition from studies to work is likely to be facilitated by the large share of Czech students who work during their studies: more than 70% work during lecture period regularly or occasionally and 40—50% during their whole study time and lecture-free period (DZHW, 2018) – one of the highest shares in the surveyed countries[75]. During the COVID-19 lockdown, many students volunteered in various ways.

Graduates report high job matches. A recent pilot survey among graduates[76] shows that in Czechia master graduates feel better prepared for the labour market than bachelor graduates (more than 12% higher) and so do technology and engineering graduates and natural sciences and health graduates compared to other fields (European Commission, 2020). An activating learning environment, defined by a high level of project-based learning, is less common in Czechia, but many students have jobs. A clear majority of the employed graduates report jobs that match both their degree and their study field. Engineering and technology (79% work in the core domain) and natural sciences (incl. mathematics) and health match most with labour market needs (74%). Social Sciences and journalism study programmes do less so (51%). A high overall job satisfaction (above 70%), high work autonomy (especially for men) and ample opportunities to learn new things are characteristic. However, less than 40% report (very) good career prospects. In addition, graduates from Czechia rate their own level of ICT skills the lowest of all participating countries. While the skills level is adequate for current jobs (European Commission, 2020), the digital transformation is likely to demand more advanced skills.

8. Promoting adult learning

Czechia launched several upskilling initiatives, including for digital skills. In November 2019 the European Social Fund project Upskilling CZ started. In line with the 2016 Council Recommendation on Upskilling Pathways, it aims to develop adults' competences (Cedefop ReferNet, 2020).

The government adopted the National Artificial Intelligence Strategy in May 2019. Education related measures to be implemented by 2021 are: *(i)* verifying development of learners' digital competence; *(ii)* boosting continuing professional development and retraining; *(iii)* supporting further education preparedness for labour market changes; and *(iv)* methodological support for schools in providing teacher training on expected curricular changes (Cedefop ReferNet, 2020). Within the Digital Strategy 2020, EVALDO, the online tool for self-evaluation of digital competencies, was further developed and an online catalogue of transferable digital competencies for 500 occupations within the National System of Occupations was created (Cedefop ReferNet, 2020).

[75] 21 EU countries and 7 non-EU countries.

[76] Participating countries: Austria, Czechia, Croatia, Germany, Greece, Lithuania, Malta, Norway.

Increasing participation in adult learning is crucial, especially for low-skilled adults. Only a small share of adults (6.2%) has not acquired at least an upper-secondary qualification, compared to the EU average of 21.6%. However, the likelihood of adults in Czechia frequently updating their knowledge and skills through adult learning is rather low - only 8.1% of adults aged 25-64 have had a recent learning experience during the last four weeks in 2019 compared to EU average of 10.8%. The share among low-qualified adults – those most in need of learning – was only 3.0% in 2019 (EU: 4.3%).

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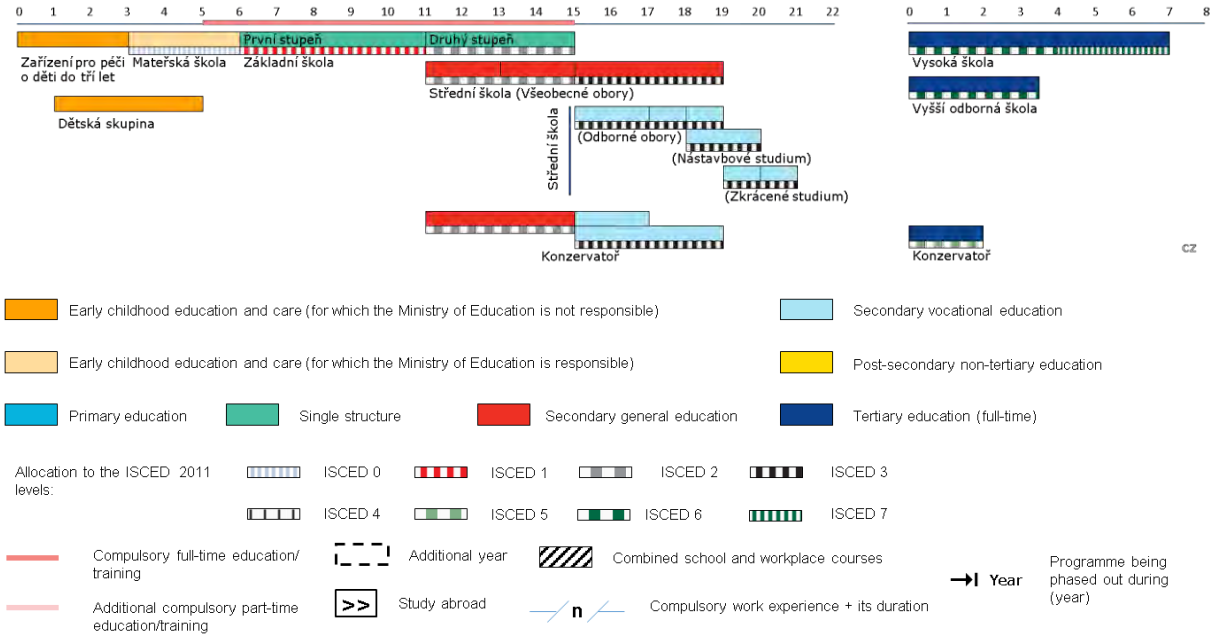
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Attila MARJAN
Attila.MARJAN@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

DENMARK

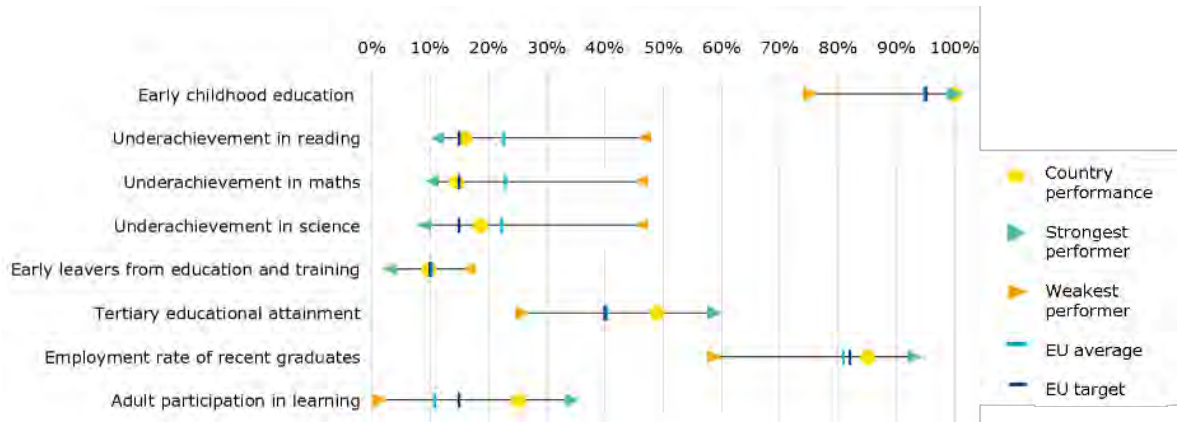
1. Key indicators

Figure 7 – Key indicators overview

			Denmark		EU average	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			11.5%	9.9%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			40.4%	49.0%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			91.9%	100.0% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		15.2%	16.0% [18]	19.3%	22.5% [18]
	Maths		17.1%	14.6% [18]	22.2%	22.9% [18]
	Science		16.6%	18.7% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		86.2%	85.1%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		31.4%	25.3%	7.9%	10.8%
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	1.8% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	9.3% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		6.9%	6.4% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€8 517 [12]	€8 628 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€7 624 [12]	€6 530 [d, 17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	: [12]	€12 477 [d, 17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		11.2%	9.7%	12.6%	8.9%
	Foreign-born		15.9% [u]	13.1% [u]	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		41.8%	48.5%	32.0%	41.3%
	Foreign-born		26.5%	51.5%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		81.9%	81.6%	72.2%	75.9%
	ISCED 5-8		90.0%	87.9%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; d = definition differs, u = low reliability, : = not available, 12= 2012, 16 = 2016, 17 = 2017, 18=2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Education institutions, students and teachers handled distance learning well due to already developed digital education but also high engagement and flexibility.
- There has been little improvement in the education performance of young people with a migrant background, and the COVID-19 disruptions may have aggravated the situation.
- Nearly all students in higher education continue directly to master studies; new legislation encourages them to move between bachelor's and master's degrees.
- Denmark invests heavily in upskilling and reskilling, further increasing participation in adult learning.

3. A focus on digital education

Schools at all levels are well equipped with digital devices and high speed broadband. In particular in primary (90%) and lower secondary (90%) education, a much higher share of schools is well equipped than the EU averages of 35% and 52%. Danish schools are much more frequently linked to the internet through connections above 100 mps. At ISCED 2 and 3[77], over 90% of students use digital devices (computer, notebook) for learning at least once a week compared to the EU averages of 52% and 59%. Around 80-90% use their own laptop in school, compared to 12% and 15% at EU level (European Commission, 2019d). In 2011 Denmark's government launched a DKK 500 million (EUR 67 million) initiative for ICT in compulsory education jointly with municipalities. Investment continued throughout 2016 and 2017 and included compulsory learning platforms.

Denmark has followed a strategic approach to developing digital infrastructure, online resources and the digital skills of students and teachers. In 2011, ICT was introduced into compulsory education, and investments of DKK 45 million (EUR 6 million) to develop digital resources, with additional investments in 2015 and 2016, a digital teacher network and a public digitalisation strategy in 2016. The latest action plan for digitalisation in compulsory education was launched in 2018 and has introduced a new subject, technology comprehension (*teknologiforstaelse*) that is currently being tested both as independent and as separate subject.

Students have good digital skills and teachers feel confident using ICT in class, even if not all have received formal training. Danish students continued to show the best computer and information technology competences in the ICILS 2018 international survey (553 points on average, up 11 compared to 2013 and with 3% reaching the highest competence level) (Fraillon et al., 2019). Digital competences are assessed for all students in national tests at both primary and secondary level (European Commission 2019c). Performance differences among Danish students due to socio-economic and migrant backgrounds or to non-availability of IT equipment at home are less pronounced in Denmark than in other countries (Fraillon et al., 2019). According to OECD TALIS lower secondary students in 2018 are among those most exposed to using ICT for projects in class (90.4%, an increase of 16.6 pps in 5 years). Even in primary school, 58.3% do so. Forty one percent of primary and 58% of upper secondary teachers report having been formally trained to use ICT, in primary less and in upper secondary school more than in other European countries. In TALIS only 39.5% of all teachers felt well prepared, but this increases to 52.2% for those who graduated more than 5 years previously. An evaluation from 2017 (Rambøll) establishes a clear link between teachers' confidence in ICT and their effectiveness in ICT teaching, and points to a need for continuous upskilling.

[77] ISCED 2/ISCED 3 91%/95%.

Box 1: Project 'Digital avenues for growth' - SME competence

The aim of the project is to support the growth potential of SMEs through digitalisation, automation and innovation. Targeted training courses focus on the specific needs of the participating SMEs. The project involves 90 of the Zealand region's SMEs and supports the skills development of 370 participants. The objective is to create 40 new jobs by 2021 and to upskill 333 participants (90 %).

Project period: 15/05/2018 – 14/05/2021

ESF Funding: EUR 1 373 813

https://regionalt.erhvervsstyrelsen.dk/eu-digitale-veje-til-vaekst-smv-kompetence-1

Well-developed ICT infrastructure coupled with strong digital competences of teachers and pupils allowed a quick adaptation to distance learning following the COVID-19 outbreak. All early childhood education and care (ECEC) institutions, schools and higher education institutions closed in mid-March 2020. They gradually started reopening from mid-April (higher education is expected to re-open in September). Schools, teachers and students were relatively well prepared for the sudden shift to home schooling, with a central communication platform, different learning platforms, digital strategies in schools, and teachers and students with good ICT skills. Initial research shows that teachers largely managed to establish good dynamics in the virtual learning environment (Gymnasieskolen, 2020a). According to a survey by Aarhus University of over 10 000 students in third and ninth grades and their parents, 80% of students knew what teachers wanted them to do and they felt part of a learning community. Parents played an important role; 80% of students received support from them, more than half from teachers and friends. Less than 10% felt they did not get support at home. Yet school closures had a major impact on the wellbeing of students: over 90% missed friends and peers (60% their teachers) and 20% reported having trouble as an online learner. To address these challenges, the administration took several measures, particularly that of instructing teachers to reach out actively to students at risk. Other challenges identified included providing adequate structure to students and sufficiently varied study material to avoid ICT overload, and allowing collaboration opportunities.

4. Investing in education and training

General government expenditure on education as a proportion of GDP further decreased to 6.4% in 2018 but remains well above the EU average (4.6%). Expressed as a share of total general government expenditure, it stood at 12.6% in 2018, again well above the EU average of 9.9%. After consecutive decreases in 2016 and 2017 (by 0.6% and 2.7% respectively), spending in real terms increased slightly in 2018 (+0.6%). The 2018 increase went to tertiary (2.3%) and secondary and post-secondary education. Teachers' pay, at 51%, absorbs a much smaller proportion of spending than the EU average of 65%. Denmark spends a significantly higher share on pre-primary and primary education (45.5%) than the EU average (34.1%) and on tertiary education (24.6%; EU average 16.4%).

Latest investments are focused on pre-primary and primary education. The primary education budget increases by DKK 275 million (EUR 37 million) in 2020 and will grow further by DKK 800 million (EUR 104 million) in 2023. Spending on ECEC will increase by DKK 828 million (EUR 107.6 million) in 2020 and will allow for implementation of minimum standards and for municipalities to hire more qualified staff. In upper secondary and higher education, previously projected cuts of DKK 678 million (EUR 91 million) for 2020 are not being implemented. The attractiveness of primary and secondary teacher salaries fell in 2011-2017, in contrast to the trend in most other EU countries (OECD 2019a). DKK 127.5 million (EUR 17 million) previously earmarked for a talent promotion programme for students have been reoriented to improving teacher education.

5. Modernising early childhood and school education

Participation in ECEC is high. All children between 4 and compulsory primary school attend ECEC (100% in 2018). According EU-SILK participation in childcare under age 3 is also high, and stable at around 66% (2019), almost the double the EU average. Moreover, the majority (58%) attend more than 30 hours a week, longer than the EU average. Children aged over 26 weeks are legally entitled to full-time publicly subsidised ECEC (European Commission, 2019e). There is practically no difference in attendance rates between disadvantaged and advantaged students (OECD, 2019b).

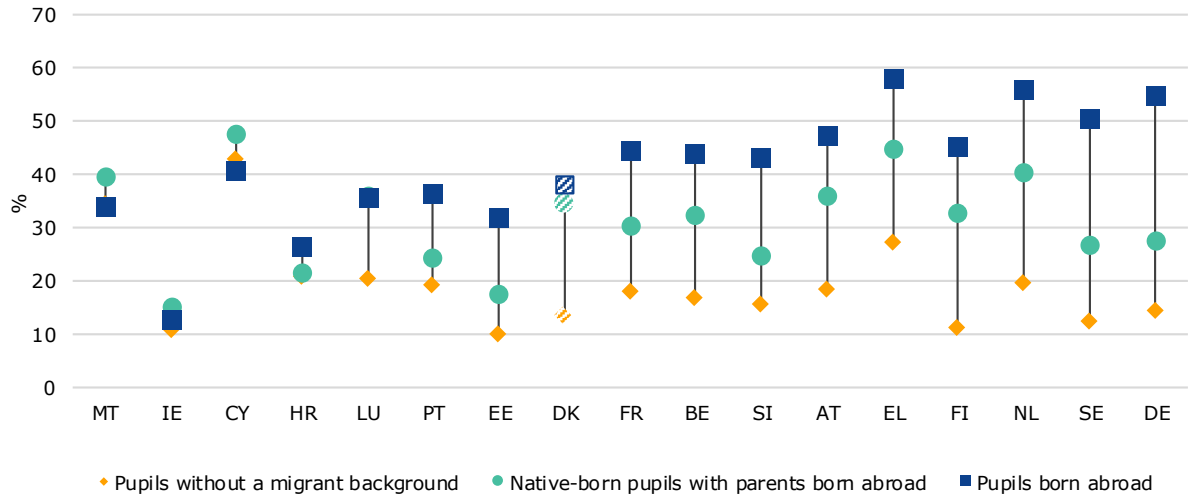
The lack of a quality framework for ECEC and uneven professionalisation of staff may cause uneven quality. Municipalities are responsible for ECEC provision. A recent report by the Danish Evaluation Institute identified significant differences between the 98 municipalities, for instance with respect to children-to-staff ratios, qualifications and mix of staff (Danmarks Evalueringsinstitut, 2020). The Day Care Act does not set minimum requirements for initial education or for the continuing professional development of pedagogical staff and assistants. Nor is there a minimum requirement for head positions. Starting salaries of staff are high by international standards but remain largely unchanged throughout the career, which makes the profession unattractive. This could result in teacher shortages in the longer term, given an expected increase by 60 000 in the number of children in the next 10 years. In 2018, only about 60% of staff had a professional bachelor's degree in 'pedagogy', and about 7% have a formal education as a pedagogical assistant. Higher pre-service qualifications tend to translate into better staff-child interaction, a key component of successful ECEC. As part of the 2020 Budget Bill, legal minimum staff/child ratios will be gradually introduced by 2025 (three children per adult in nurseries, and six children per adult in kindergartens). But Denmark has adopted an updated pedagogical curriculum for the 0-6 year olds to be implemented across all ECEC institutions by 2020.

Facilitating transition from ECEC to primary education is particularly important for children with a disadvantaged background. Access to quality ECEC is particularly important for children from a disadvantaged background, who are also likely to need support to facilitate the transition to primary school. While the broad objective of facilitating transitions is specified by law and there are some common child monitoring methods such as development reports, there are major differences in local approaches (OECD, 2019b), leading to uneven levels of support. The government invests DKK 1.6 billion (EUR 208 million) in higher quality, to provide more pedagogical staff in areas with children from vulnerable backgrounds and for upskilling of pedagogical staff. Nevertheless, more attention is needed to support transitions, in particular by improving collaboration among the responsible bodies.

Pupils show good average basic skills and the share of underachievers is low. The share of 15 year-olds that underachieve in basic skills, as measured in the OECD's Programme for International Student Assessment (PISA) 2018, is well below the EU average and better than or close to the 15% EU benchmark (mathematics 14.6%, reading 16.0% and science 18.7%). Since 2012, the share of underachievers remained broadly unchanged in mathematics, reading and science. The share of top performers is close to the EU average and, while largely unchanged for mathematics and science (11.6% and 5.5% respectively), almost doubled in the past decade for reading (now at 8.4 %).

Socio-economic inequalities and some gender imbalances persist. According to PISA pupils with a migrant background perform considerably worse in reading (-65 points) than native born. Even after taking account of socio-economic disadvantage, the gap stands at -34 points, about twice the EU average (18.3). The share of low achievers in reading among foreign-born pupils is also very high, 38.3%, against only 13.3% among native born, and decreases by only about 4 pps to 34.6% for second-generation migrants. This is a substantial challenge, as about 10.7 % of Danish students have a migrant background (OECD, 2019c). Seventy-six per cent of foreign-born and 44% of second-generation students do not speak Danish at home. Since 2009 the attainment gap in reading among the first generation has slightly worsened (+12) and has barely changed for the second generation (+1). There is a significant gender gap, in particular in reading, with the share of low achievers 9.8 pps lower among girls than boys. Between 2015 and 2018 this worsened by 3.9 pps.

Figure 3 - Underachievers in reading by migrant background, PISA 2018



Source: OECD (2019), PISA 2018. Note: EU Member States with a share of migrant pupils lower than 5 % are not shown in the chart.

Wellbeing among pupils is comparatively good and remains stable. In PISA students report that they feel at home at school (only 28% disagree, 7.2 pps below the EU average). But those who do not feel at home show an above average negative impact on their reading performance. Bullying is an issue, but has little negative impact on reading performance (-3 at student and -9 at school level). Values have remained stable between 2015 and 2018. The rate of absenteeism is similar between boys and girls and is more linked to social disadvantage and migrant background than the EU average. Wellbeing was one focal point of the reform of primary schools (Folkeskolereform) in 2013; nevertheless, recent evaluations found no major improvements either in wellbeing or in education outcomes. Reforms in this area have not yet been fully implemented.

The lack of qualified teachers and support staff risks somewhat affecting teaching quality. The OECD TALIS 2018 study shows that Danish teachers have high self-efficacy from the start of their careers. A variety of factors influences the quality of teaching. Schools tend to be about half of the EU-27 average size, the pupil/teacher ratio is also favourable at 11.9 and teaching practices have shifted to more autonomy and responsibility among students. Danish teachers spend more time actually teaching in class than their peers elsewhere. School heads consider the most important obstacles to quality education to be the shortage of qualified teachers and support staff for learners with special educational needs, as well as lack of sufficient time with students. The 2020 Budget Bill earmarked a total of DKK 275 million (EUR 37 million) in 2020, increasing to DKK 800 million (EUR 107 million) in 2023, to employ more teachers in public schools. The removal of the tertiary education ceiling (*uddannelsesloftet*) will allow higher education institutions to provide more study places for teachers (European Commission, 2020).

Teachers choose their career out of interest in children and not for financial security, but many leave the profession early. Danish teachers state that they choose the profession primarily to influence the development of children and young people (94.2%) and linked to their personal preferences (61.1%); pay or job security motivate their choice less. However, about a 20% of teacher below 50 intend to leave teaching within the next 5 years (double the EU average). Teacher starting salaries are relatively high, but still below that of other workers with a tertiary degree, and they have become less attractive over time (OECD 2019a). The pay structure is rather flat and salaries increase little during the career. Teachers in public schools tend to be more content with their financial situation than those in private schools, but this is reversed for school leaders (TALIS), whose salaries are determined by school characteristics and local circumstances. Danish schools enjoy a high level of autonomy. School leaders have a decisive say on staff policies, school budget and on administrative and pedagogical management of schools.

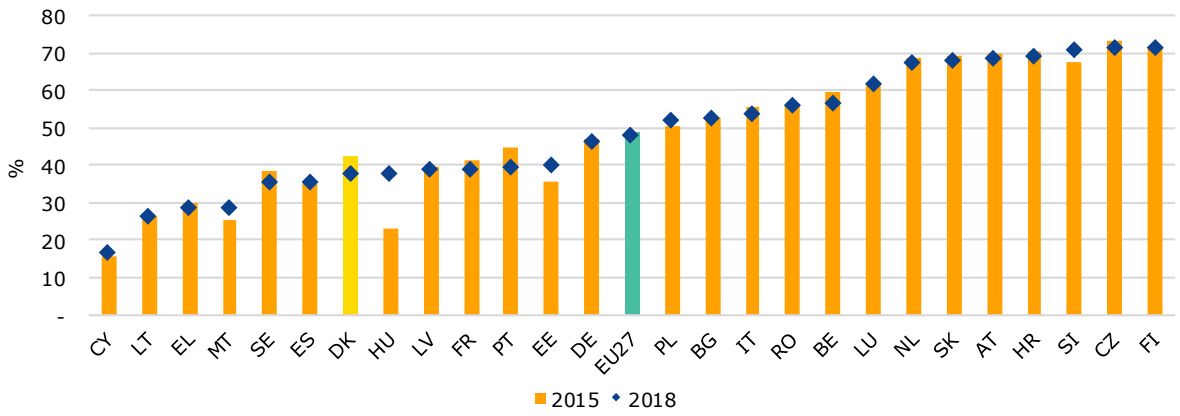
Government is reforming access to teacher training to increase quality and reduce dropouts. The government has remodelled the admission process to teacher training to ensure a better match between applicants and the job requirements, thus reducing dropout, which amounted to 41% in 2005. This introduces a qualitative element into access to teacher training, balancing the financial incentive for institutions to maximise the number of students (OECD, 2019a). While initial teacher education is strong in areas like pedagogy, it is less so in preparing trainees for teaching in a multicultural or multilingual setting. Opportunities for professional development are close to the EU average, but are lacking more importantly in relation to multicultural and multilingual teaching and special needs. The OECD TALIS study observed no improvement in the competences of teachers in these areas in 2013-2018.

Denmark shifted rapidly to digital learning in the COVID crisis, but home schooling provided a challenge for younger students. It quickly emerged that home schooling was challenging in particular for younger children, who need the structure offered by schools, and for children from lower socio-economic and migrant backgrounds. The Minister of Education therefore instructed teachers early in the lockdown to reach out in other ways where students did not turn up online. Application procedures for higher education were amended, and the final upper secondary grade exam was reduced to two written and one oral exam. Preliminary research indicates that parents of primary school children found it difficult to provide the necessary support for home schooling, in particular when they were teleworking. Parents nevertheless also report that they gained a better understanding of their children's learning and closer collaboration with teachers. Home schooling also presented challenges for teachers, in particular keeping contact with students and adapting requirements to their capacities. The return to school brought new challenges related to hygiene and social distancing. The administration collaborated closely with all stakeholders. The return highlighted an apparent loss of motivation, particularly among upper secondary students, one of the last groups allowed to return. A fund of DKK 5 million (EUR 670 000) aims to boost motivation of these students through additional one-to-one interaction with teachers.

6. Modernising vocational education and training

Participation in VET is below the national target and dropout is high. In 2018, 37.7% of learners at the upper secondary level were enrolled in a VET programme, below the EU average of 48.4%. Regional differences are significant, with the lowest participation rates in the larger cities (Cedefop, 2020). According to national data, VET programmes have the highest dropout rates when compared to other educational paths. (Danmarks Statistik, 2019). According to the most recent available data from the 2016 EU labour force survey, the exposure of VET students to any form of work-based learning is slightly below the EU average (53.1 vs. 59.5%). However, Denmark is above the EU average when focussing apprenticeships as a more comprehensive way of integrating work-based learning into VET. The employment rate among recent VET graduates in 2019 decreased slightly to 84.7% from 85.0% in 2018, but is still above the EU average of 79.1%.

Figure 4 - Share of upper secondary students in VET, 2015 and 2018



Source : Eurostat, UEO: [educ_uoe_enrs04].

Final VET exams are held if possible, but VET schools may otherwise provide the VET student with a degree and administrative diploma. VET schools reopened on 20 April, after the COVID-19 lockdown in March, for students with less than a year to graduation. Students unable to complete their education programme within the fixed maximum study period will have the possibility to extend it. The COVID-19 epidemic has intensified the use of distance learning in VET; however, teachers and learners expressed their worries about the lack of opportunities for hands-on-experience in practical subjects. Evaluations point out that groups at risk will become further challenged (Cedefop, 2020). The Education Ministry has conducted a general evaluation of VET institutions' use of ICT platforms, concluding that there has been clear progress.

Denmark continues efforts to address a shortage of apprenticeship places. The networks of 'advantages programmes' expanded from 29 to 37 in 2019. The programme funds employers to guarantee apprenticeship to graduates of the second basic programme (GF2) (Cedefop, 2020). However, according to an analysis by the Danish Building Employers Association, the COVID-19 crisis will have a major impact on the supply of apprenticeships. Their worst-case scenario is a reduction by 7 700 from 2019 to 27 800 in 2020 (Dansk Byggeri, 2020). This spring, 14 500 VET students who completed their studies, as well as 500 who have definitely lost their apprenticeship during the crisis, needed an apprenticeship (Folktinget, 2020). A tripartite agreement will reallocate a surplus of around EUR 670 million from the Employers' Education Grant (AUB) to provide a wage subsidy scheme for apprenticeships. From May 1 until end of 2020, companies will receive 75% of their ongoing apprentices' salary. Wage subsidies are also granted for new agreements: 45% for short agreements and 90% for ordinary education agreements. In addition, all employers received an extraordinary subsidy to support the continued creation of apprenticeships (Beskaeftigelsesministeriet, 2020).

7. Modernising higher education

The tertiary attainment rate has continued to increase to 49% in 2019, with women (57.1%) strongly outnumbering men (41.2%). Tertiary attainment rates vary considerably between cities (65.7%) and rural areas (32%) - a gap of 33.5 pps, twice as high as the EU average. While the rates for the native-born (48.5%) and foreign-born (51.5%) population are relatively similar, it drops to 45.1 % for people born outside the EU. The share of tertiary graduates in 2018 in STEM fields keeps slowly increasing, but, at 22.2%, is still below the EU average of 25.4%. Female STEM graduates make up 32% compared to 56% in all study areas, both around the EU average.

Students are comparatively old, and more likely to complete their studies within the programmed time and continue to at least master level. Danish students are older than their EU counterparts: 25.9% of bachelor and 49.9% of master students were 25 or older when they started their studies, but they are more likely to finish their studies on time (50%, and an additional 30% after another 3 years) and few drop out (less than 15%) (OECD 2019f). After completion of a bachelor's degree, 99 % continue to a master's. The structure of student support facilitates this. To encourage bachelor graduates to start working, the government introduced the possibility in the grant system of waiting up to 3 years after completing a bachelor's degree before starting a master's, without losing any rights. The earnings premium for higher education is relatively modest for a bachelor's degree, but about 10% higher for short-term studies and 20 pps higher for those with master's degrees (OECD 2019f).

International students are numerous, particularly at doctorate level, and universities have a high scientific output. International participation amounts to 36.2%, 19.6%, 12.98% and 5.79% at doctorate, master, short cycle and bachelor level. The large number of courses offered in English, and no tuition fees combined with student support, make Denmark highly attractive for incoming students. Few foreign graduates stay to work, however, which has motivated the government to reduce the number of courses in English. With its important inflow of scientific talent, Denmark was in 2015 among the most productive countries in terms of scientific publications (OECD 2019f).

Box 2: Danish universities have a long tradition of university extension courses delivering non-formal education

University extension courses are a nationwide initiative to disseminate the results of research produced by higher education institutions to the wider community in the form of lectures and courses. They are delivered through four divisions in the cities of Copenhagen, Aarhus, Odense and Aalborg. In addition, more than 100 university extramural committees deliver non-formal education in other regions. The programme covers a wide range of subjects, including health and natural sciences, humanities, social sciences and theology. The Council for the University Extramural Department (Folkeuniversitetet) provides grants to cover some of the costs (teaching, travel and administration). Participants pay a fee, which amounts to between a quarter and a third of the cost (Danish Ministry of Education, 2018).

8. Promoting adult learning

Adult participation in learning has decreased significantly in recent years, but remains among the highest in the EU. The rate has declined from 31.3% in 2015 to 25.3% in 2019, still more than double the EU-27 average (10.8%). The drop may be linked to high economic activity, during which employers may have allowed less time for training – the fact that participation for those in employment has declined more than for the unemployed supports this hypothesis. Among the 25.3% who take part in adult learning, there are no significant differences in terms of skills level or educational background. There are, however, significant gender gaps, with the participation of men (20.7%) being lower than that of women (30.0%) (Cedefop, 2020).

A political agreement (October 2019) earmarked DKK 102 million (EUR 13.7 million) for the upskilling of unskilled workers. The overall aim is to ease the shift from unskilled to skilled work and to address labour shortages by ensuring the supply of skilled workers with necessary competences. It was also agreed to continue the job rotation scheme in 2020, allowing unskilled workers in certain sectors (e.g. health) to take part in training to become a skilled worker in the same field, while an unemployed person fills the position while training takes place. Launched in February 2019, the National Coalition for digital skills and jobs aims to promote digital skills. With more than 10 000 members, it supports actions to supply high-quality graduates in line with labour market needs (Cedefop, 2020). Digital skills of adults are better than the EU average and very few Danes have no digital skills (DESI 2019).

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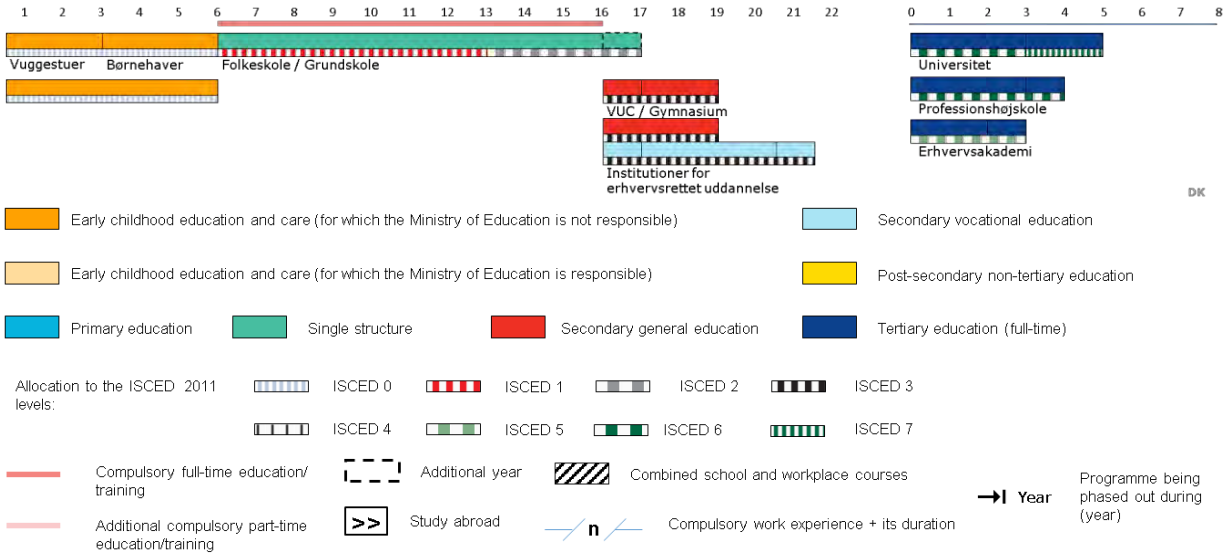
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Klaus KOERNER
Klaus.KOERNER@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

European Commission

ESTONIA

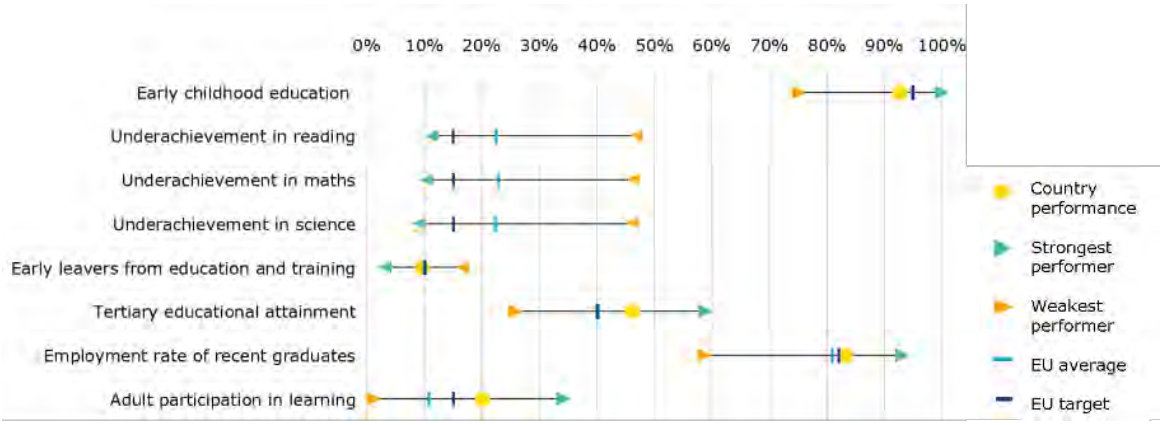
1. Key indicators

Figure 8 – Key indicators overview

			Estonia		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			13.5%	9.8%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			36.3%	46.2%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			96.1%	92.8% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		13.3%	11.1% [18]	19.3%	22.5% [18]
	Maths		12.7%	10.2% [18]	22.2%	22.9% [18]
	Science		8.3%	8.8% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		67.7%	83.3%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		10.5%	20.2%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	10.1% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	5.5% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		7.0%	6.2% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€4 654 [12]	€5 240 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€5 551 [12]	€5 085 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€6 414 [d, 12]	€10 154 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		13.8%	9.6%	12.6%	8.9%
	Foreign-born		: [u]	: [u]	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		35.9% [u]	44.2%	32.0%	41.3%
	Foreign-born		44.6%	75.9%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		65.2%	79.4%	72.2%	75.9%
	ISCED 5-8		70.5%	87.5%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG Education, Youth, Sport and Culture, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series, d = definition differs, u = low reliability, : = not available, 12 = 2012, 16 = 2016, 17 = 2017, 18=2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG Education, Youth, Sport and Culture, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Digital solutions are an integral part of teaching and learning in Estonia. The constant focus on digital education has allowed a rather swift move to distance-learning in reaction to COVID-19.
- The Estonian school system equips young people with a high level of basic skills, combining excellence with a high degree of equity. However, reducing early school leaving, improving the labour market relevance of education and training, and further expanding adult learning programmes remain key to ensuring adequate skills levels in the post-COVID context.
- Significant efforts were made to improve the attractiveness of the teaching profession. However, attracting young talent in response to the high share of ageing teachers remains a pressing challenge.
- Graduates from vocational education and training (VET) have good prospects of finding a job.

3. A focus on digital education

Estonia ranks high in the Human Capital dimension of the Commission's Digital Economy and Society Index (DESI) Estonia had reviewed and updated its 'Digital Agenda 2020' strategy in 2018. Estonia ranks 3rd in the EU on Human Capital dimension of DESI. Sixty-two percent of the population have at least basic digital skills and 37% have above basic digital skills, both above the EU average (58% and 33% respectively). The percentage of ICT graduates (7.4%), ICT specialists (5.7%) and female ICT specialists (2.6%) in Estonia increased in 2019 and is higher than the EU average (3.8%, 3.1% and 0.8% respectively). However, businesses have identified skills shortages as some of the main obstacles to investment (84% of firms).

Digital education and digital skills are key priorities in education and training policies. Estonia's ambitions as a digital society are reflected in continuous efforts to apply modern digital technology in learning and teaching, improve teachers' and students' digital skills and improve digital infrastructure. The constant focus on digital education and digital solutions has allowed Estonia to move rather swiftly to remote-learning, in reaction to COVID-19. For the future, authorities aim to further build the effectiveness of information technology in learning, teaching and school leadership (MoER 2019a).

Estonian teachers regularly use digital solutions in teaching but feel that their digital skills are in need of improvement. A 2018 teacher satisfaction survey (Ministry of Education and Research 2019b) showed that 95% of teachers in general education schools use digital solutions in the classroom, with two-thirds assigning students tasks to be completed in a digital environment. Thirty-nine percent of teachers reported using computer-based tasks when assessing students. About three quarters of the surveyed teachers use computers and presentation tools daily or weekly, while less than 10% of teachers have used digital tools such as measuring sensors, 3D printers, robotic and mechatronic devices. Nevertheless, teachers self-assess their own digital skills as insufficient (OSKA, 2018a). Only 30% of teachers reported in the 2018 OECD TALIS survey that they feel sufficiently prepared to use ICT in teaching (Taimalu et al., 2018). This situation can be explained by at least two factors: rapid technological progress, which requires teachers to update their skills regularly (Haaristo et al., 2019; Leppik et al., 2017), and to some extent the large proportion of teachers over 50 years of age, with younger teachers self-reporting a higher level of digital skills. Digital learning has been a focus for teachers' continuing professional development (CPD) in recent years (OECD, 2020). Between 2016 and 2020, about 80% of teachers have attended CPD in digital skills and the vast majority considers that their skills have improved (Haaristo et al., 2019). Much of the training is free of charge and funded by the European Social Fund (ESF). In TALIS 2018, the percentage of teachers who reported that ICT skills for teaching was included in their professional development activities was among the highest in the OECD: 74.1% v 60.4% to replace with EU averages (TALIS 2018).

Schools in Estonia are digitally well equipped. Ninety-nine percent of students in upper secondary education and around 90% in primary and lower secondary education go to highly digitally equipped and connected schools, significantly more than the average in the EU. Estonian schools have better internet access compared to the EU average. More than half of Estonian students attend schools where the Internet speed is over 100mbps; 78%-91% attend schools with wireless LAN (European Commission, 2019). Smart devices and also computers are used in teaching and learning. Significant investments, including with EU funds, were made between 2016 and 2019 to improve school digital infrastructure and expand digital learning resources for general and vocational education. The authorities plan to further modernize school infrastructure in all schools by 2022 (MoER, 2019c).

Digital competences of students' and schools are assessed through self-assessment and standardised evaluations. In 2019, Estonia developed a standard determining test to measure students' basic level of digital competences. 83% of the 9th grade sample students reached the pass mark (50%). Students receive verbal feedback on their performance, and schools receive feedback on their delivery of digital competencies. (MoeER, 2020) Furthermore the 2018 Satisfaction Survey showed that 69% of fourth graders and only half of eighth grade students believe that digital skills are adequately taught at school. The percentage goes down to in the case of eleventh graders (41%), (MoER, 2019b). Advanced IT education and advanced IT skills training are not compulsory within the national curriculum, but in practice more than a third of students are exposed to these through various subjects, elective courses or hobby class (ibid). In addition, at school level, the Digital Mirror is a tool used to help schools to assess their digital maturity and develop an improvement plan. Although Estonians are unhappy with their level of digital skills, there skills level is above the average in the EU. The Digital Economy and Society Index (DESI) shows that in 2019 96% of Estonians aged 16-19 assessed their skills as basic or above basic, compared to the EU average of 82% (DESI). This contradiction could be partly explained by the difference existing between self-perception, expectations and real skills levels.

Box 1: European Structural and Investment Funds support the development of digital skills in Estonia

"E-koolikott" is an electronic platform for digital learning resources for basic schools, general upper secondary and vocational education. It includes materials created by teachers and education specialists, universities and publishers. These learning resources are intended primarily for teachers and students as primary and supplementary materials, but are also made available to parents. The simple 'reading' mode is available for everyone. With ID-based authentication, it is possible to include more study materials, to recommend and give feedback, and to make personal compilations of study materials.

See: https://e-koolikott.ee

4. Investing in education and training

Estonia's investment in education and training is high in EU-comparison. The latest available data shows that in 2018, Estonia's general government expenditure on education recorded a strong growth of 10.9% in real terms, reaching the equivalent of 6.2% of GDP (COFOG). This percentage is significantly above the EU average of 4.6%. As a share of total government expenditure, spending on education was the highest in the EU in 2018 (15.8% compared to EU-27: 9.9%). In 2020, additional funds were earmarked to further increase teacher salaries, including a top-up for higher education staff, as well as extra funds for improving Estonian language learning in kindergartens and schools. As a reaction to COVID-19, supplementary funding was allocated to support research and development activities and private education providers in overcoming the impact of the coronavirus (NRP, 2020).

Box 2: Smart and Active Estonia 2035

Estonian authorities are in the process of developing the country's education and training strategy for the period up to 2035, as a successor of the Lifelong Learning Strategy 2014-2020. Strategic goals of the strategy include: diverse and accessible learning opportunities and education system that enables flexible learning pathways; competent and motivated teachers and school leaders, diverse learning environments and learner-centered approach; learning opportunities match the development needs of the sociey and the labour market, covering all levels of education and training, from early childhood education and care to adult learning, and will constitute the basis for planning EU funds in the period 2021-2027. The strategy also has a strong dimension on non-formal learning and youth policies closely linked to education.

5. Modernising early childhood and school education

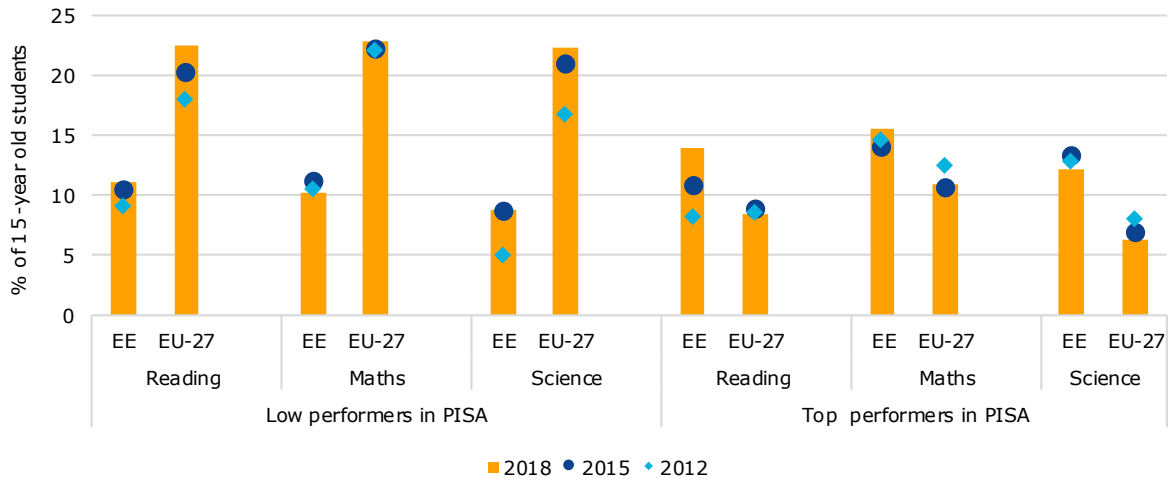
Efforts to modernise early childhood education and care continue, while participation rates remain somewhat below the EU average. In 2018, the participation rate in early childhood education for children aged 4 to compulsory primary education age was 92.8% (EU average: 94.8%). For children aged 0-3, the enrolment rate in childcare was 28.3% (EU average: 34.7%). A new curriculum for kindergarten children is under preparation. The International Early Learning and Child Well-being study (OECD, 2020a) found that children in Estonia have strong self-regulation and social-emotional skills. To support Estonian language learning from an early age, the pilot project providing Estonian speaking teachers in pre-school education groups in the two regions with the highest proportion of Russian speakers continues.

The Estonian school education system equips young people with a high level of basic skills. Estonia remains at the top of the rankings in the 2018 OECD Programme for International Students Assessment (PISA). The average score of Estonian 15 year-olds is the highest in the EU in all tested subjects and one of the highest in the world. Furthermore, the proportion of underachieving students is the lowest in the EU and significantly below the EU average and the EU benchmark of less than 15% by 2020: 11.1% in reading (EU average: 22.5%), 10.2% in mathematics (EU average: 22.9%) and 8.8% in science (EU average: 22.3%). Only 4.2% of Estonian students are underachievers in all three tested subjects simultaneously (EU average 13.2%). Compared to 2009, Estonia's performance has recorded steady growth in reading and mathematics and stable and high results in science (MoER, 2019d).

Estonia combines excellence in teaching basic skills with a high level of equity. The impact of socioeconomic status on student' performance is one of the lowest in the EU. Only 6% of reading performance is explained by socioeconomic status (the EU average is 14%), while the percentage of resilient[78] students is one of the highest among PISA-participating countries. Even so, there is score-points difference of 61 in reading (comparable to between 1 and 2 years of schooling) between advantaged and disadvantaged students. As in all participating countries, Estonian girls significantly outperform boys in reading, although this gap has decreased over time following an improvement in the reading score of boys. The percentage of top performers, which captures to what extent a school system can produce excellent results in basic skills, is one of the highest in the EU (Figure 3).

[78] Resilient students are those from the bottom quartile of the PISA index of economic, social and cultural status (ESCS) who beat the odds against them and perform at high levels when compared with students of the same socio-economic status from around the world (OECD)

Figure 3 - Low and top performers in reading, maths, science in PISA between 2012 and 2018



Source: OECD (2019), PISA 2018. Note: The EU-27 averages for reading do not include ES results.

Measures were taken to facilitate education during the pandemic. During the pandemic period, the Government of Estonia decided to close all educational institutions, except kindergartens, and applied only digital learning solutions from 16 March due to the spread of the coronavirus in Estonia. The situation was reassessed regularly. All educational institutions (but also adult training schools and hobby schools) were recommended to use distance learning opportunities as much as possible until the end of the academic year. The Ministry of Education and Research (MoER) provided daily support for all educational institutions. In Estonia, all learning materials are available on paper and online in parallel, schools are digitally well equipped and connected. The Ministry of Education and Research provided only a few framework regulations to be followed during the distance learning period, leaving most decisions, and planning to school and kindergarten owners (municipalities to a large extent in general education and early childhood education). On the one hand, it is in line with the general approach of extensive professional autonomy in education management in Estonia. However, on the other hand, it allowed a great variety of mixed approaches which, were in part greeted with approval, but also with confusion and dissatisfaction by some stakeholders. In general, previously introduced e-solutions made the transition from regular schooling routine to distance learning considerably smooth. For example, a regular use of national electronic homework diaries/communication points eSchool and Stuudium by all schools, and from the first grade, ensured the familiar connection point between students, parents and teachers. Over the last years the government had initiated very good cooperation projects for co-creation of services with startups that provided free services for schools.

Tackling early school leaving remains a key challenge for improving the skills of young people. The rate of early leavers from education and training in the age group 18-24 declined in 2019 to 9.8%, compared to 11.3% the year before. The rate is now below the EU average of 10.2% but remains high in the context of a shrinking workforce and the need for a better trained, more flexible workforce. This is even more relevant in the post-COVID context. The 2019 drop is explained by a sharp decrease in the rate of early school leavers among men, even though the rate remains significantly higher compared to women in the same age-groups (i.e. 5.8 pps). Available data suggest that reducing early school leaving will remain a challenge in the short to medium term: while drop-out rates are low at the end of basic education, they have not declined significantly in upper secondary education, while the completion rate of upper secondary education is at the same level as in 2010 (i.e. 81.1%). In basic education lack of motivation, (MoER, 2018), combined with insufficient access to support and career guidance services (Haaristo et al., 2019), remain key drivers of early school leaving.

Significant efforts were made to increase the attractiveness of the teaching profession, which remains rather low. In 2018, 49.4% of school teachers (ISCED1-3) in Estonia were older than 50 (EU average 38.8%). Teacher salaries have continued to increase in a bid to raise the attractiveness of the profession but reaching the target of 120% of the average wage is proving to be challenging due to the fast wage increase in Estonia (MoER, 2019c). Between 2014 and 2019, the average salary of an Estonian teacher, working full-time, has increased by nearly 32% and the minimum salary by 39%. In general, working conditions have shown some improvements in recent years and include comparatively low teaching hours and early career subsidies (OECD, 2020b). However, initial teacher education programmes remain undersubscribed. Although in 2018 applications at the universities of Tallinn and Tartu increased by 24% compared to the previous year, the number of applications per place was only 0.9 (OECD, 2020b).

The performance gap between Estonian and Russian-medium schools persists. In PISA 2018, students from schools with Russian as the language of instruction scored, on average, 42 points lower in reading, 29 points lower in mathematics and 42 points lower in science. These performance gaps, alongside poor acquisition of the Estonian language, may impact Russian-speaking students' study options at the end of basic school, as well as their opportunities to enter higher education or the labour market. Although the proportion of Russian-medium basic school graduates with at least B1 proficiency in Estonian has increased since 2011, the national target of 90% by 2020 is out of reach. However, in the International Early Learning and Child well-being study 2020 (IELS), Russian-speaking students scored higher than Estonian-speaking students on a range of early-learning measures, suggesting that these disparities do not exist at every level of the education system (OECD, 2020a).

School climate is faced with some challenges. The disciplinary climate in Estonian schools, as reported by 15 year-olds, has shown some improvements and is among the best in the OECD (OECD, 2020b). However, 25% of the students reported having been bullied at least a few times a month (EU average: 22.1%). Their reading performance was 15 score-points lower compared to students who did not report bullying (EU average: 35 score-points). In recent years anti-bullying policies have gained importance. Estonia developed a bullying-free education concept setting out insights and approaches that ensure a safe school path for every student (MoER, 2019c). However, 26.4% of Estonian youngsters reported a sense of not belonging to school, 4.4 pps p more than in 2015. This is strongly linked with lower PISA performance, reducing scores by 29 score-points (EU average: 16 score-points).

6. Modernising vocational education and training

Graduates from vocational education and training (VET) have better prospects of finding a job than on average in the EU. In 2019, the employment rate of recent VET graduates in the age group 20-34 was 86.2%, above the EU average (79.1%) and higher than the employment rate for graduates of general upper secondary education (62.6%). VET, including higher professional education qualifications, boosts salary by 5-20%[79] compared to general upper secondary education (Cedefop ReferNet Estonia, 2019). Yet, participation rates in VET remain below the EU average: 40.1 % of all learners in upper secondary education (UOE, 2018), below the EU average (48.4%). To enhance responsiveness, the planning of study places in programmes of national importance is negotiated separately with each school and the school council (Cedefop ReferNet, 2020). Participation in work-place based learning is low at 6%, compared to the EU average of 28% (UOE, 2018) but gradually improving. An important step towards strengthening the work-based learning tutor competence model is now being integrated into the VET teacher occupational qualification standard that gives WBL - work-based learning tutors an opportunity to obtain a professional qualification certificate (Cedefop ReferNet Estonia, 2020).

[79] Wage premium for tertiary graduates exists.

In 2019, the VET learner-based financing system was amended to improve accessibility in regions, motivation and autonomy of providers. The state covers operational costs, of which 20% are now performance-based. The flexible organisation of VET allowed providers to adapt provision during the abruption of teaching due to the COVID-19 pandemic. Study resources for VET are available in the learning resources portal e-koolikott however neither a vocational nor a final exam are being held during distance learning.

7. Modernising higher education

Tertiary educational attainment remains above the EU average but low completion rates are problematic. Although tertiary educational attainment in the age-group 30-34 was above the EU average in 2019 (46.2% compared to 40.3%), it had fallen for a second consecutive year (from 48.4% in 2017). The rate risks to decrease further if the high drop-out rates persist. In 2019, 13.5% of all higher education students had dropped out, with the rate varying between 7.9%, in health related programmes to 16.2%, in ICT programmes. Drop-out rates are particularly high in the first academic year, especially in engineering and construction (28.6%) and natural sciences, mathematics and statistics (28.1%). Only 34% of students actually graduate in nominal time (Reps, M, 2019). With forecasts showing that the number of higher education graduates will not suffice to meet future labour market needs (OSKA, 2018b), improving completion rates is essential. What is more, in 2019, the already wide gender gap in tertiary educational attainment worsened and now stands at 26.6 pps (with 33.5% for men and 60% for woman).

Better aligning higher education to labour market and learners' needs remains important in the post-COVID-19 context. Preliminary analysis (OSKA, 2020) suggests that longer-term trends that began before the COVID-19 pandemics will continue to impact the economy, with demand likely to increase in a number of sectors, including ICT, construction, healthcare and education. An increase in the number of STEM graduates is seen as important for productivity growth (EC, 2020; MoER, 2019c). Although the proportion of graduates in STEM fields has increased in recent years (30.7% in 2018, EU average: 25.4%) the actual number of professionals ready to enter the labour market is rather low. This is due to the combination of demographic factors, high-drop rates and the unattractiveness of certain STEM fields. In fact, ICT is the only study field that recorded an increase in the number of students over the past ten years (+24%), with the rest declining with rates from 7% (health and welfare) to 54% (in social sciences). Despite the significant shortage of specialists in several technological fields, the number of graduates in these fields is decreasing to add (MoER, 2019c). The number of students entering higher education is decreasing as the late cohorts in relevant age have been decreasing. Due to the increase of students at second and third levels (stemming from to the interest of international students) and comparatively fewer students at bachelor level, students' average age increased to 27. However, the education system remains too rigid in this respect; the organisation of studies is based on the logic of linear educational paths and does not provide sufficiently for work-study combinations. It does not take into account the needs of modern learners and does not enable a swift adaption to requirements of the rapidly changing labour market (ibid).

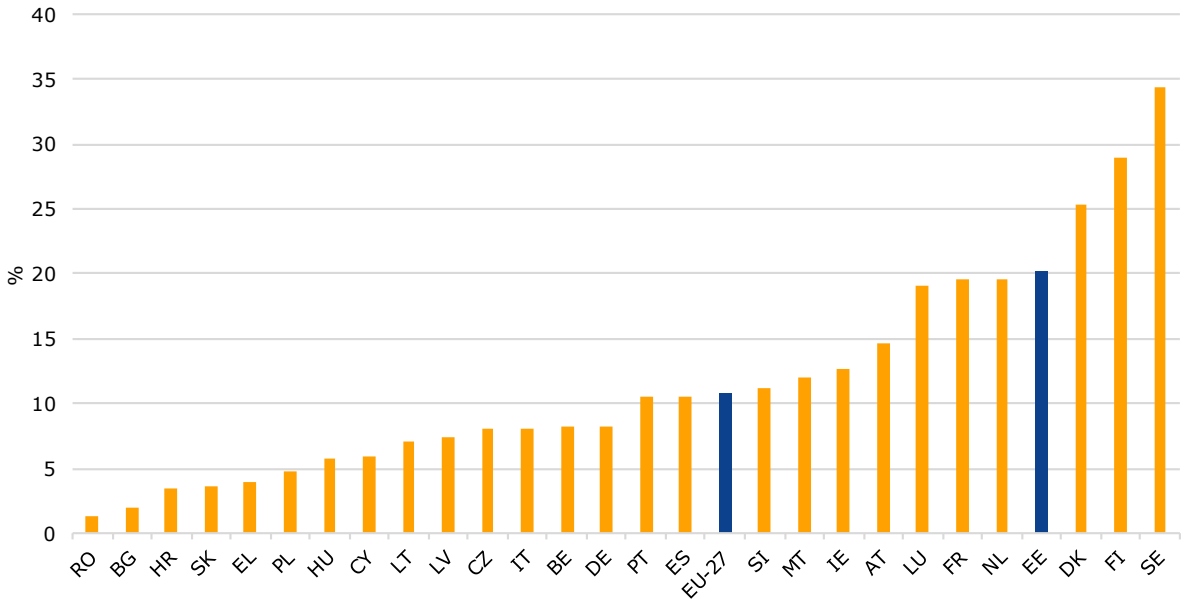
Higher education institutions in Estonia have a good level digital infrastructure. Institutions had earlier experience with regular use of e-learning from previous times, which was benefiting the distance learning situation during the pandemic period to a large extent supported significantly by EU funds. Students in higher education are well equipped with digital devices.

8. Promoting adult learning

The focus of adult learning policies is increasingly on delivering high quality learning through implementation of a monitoring and evaluation framework. In 2019, Estonian adults within the age group 25-64 were almost twice as likely to participate in learning compared to the EU average (20.2% v 10.8%). Participation in learning schemes has also increased for the low qualified (9.2% compared to 7.4% in 2018) and for the unemployed (22.3%). Since October 2019, the quality of courses given by 500 trainers across the country to unemployed people is assessed based on the conditions set out in the Adult Education Act. Training providers for

unemployed are evaluated first, while the overall framework will be implemented more widely in the future. The framework is developed and implemented by the Estonian Quality Agency for Higher and Vocational Education. A pilot evaluation in 2018 showed that only about 50% of the course providers met the quality criteria (Unemployment Insurance Fund, 2019). It aimed to encourage training providers to make further decisions on the necessary measures to increase the quality of adult training.

Figure 4 - Participation rate in education and training, (25-64), 2019



Source: Eurostat, LFS, [trng_lfse_03].

In the current Covid-19 pandemic, efforts are made to invite adults to acquire new skills and knowledge through online learning. This is accompanied by a worldwide increase in the access to free online learning platforms and programmes. As a potential positive effect, this might raise the importance of informal learning during the crisis as well as beyond it. The share of adults who have basic or above basic overall digital skills increased slightly to 65% in 2019. However, there is a risk of skills polarisation between high- and low-skilled people and between those with the skills and motivation for self-managed online learning and those without these skills. The Estonian Lifelong Learning Strategy pays specific attention to raising digital skills among the Estonian population (MoER, 2014). The share of population (aged 16-74) with at least basic level of digital skills has increased gradually from 65% in 2012 to 88% in 2017[80]. A target has been set to increase it to 95% by 202 (MoER, 2020).

The number of adults with no secondary or professional education in Estonia remains relatively high despite policy efforts to reduce it. To mitigate skills mismatch, in 2020 almost 600 publicly funded non-formal training courses were planned to be provided to 7 300 adults in vocational education institutions (MoER, 2020a). These courses are further complemented by courses given by Unemployment Insurance Fund focusing particularly on risk groups, either employed and unemployed.

[80] The methodology of calculating level of digital skills in 2014 differed from DESI methodology. Within the new strategy Estonia uses DESI methodology.

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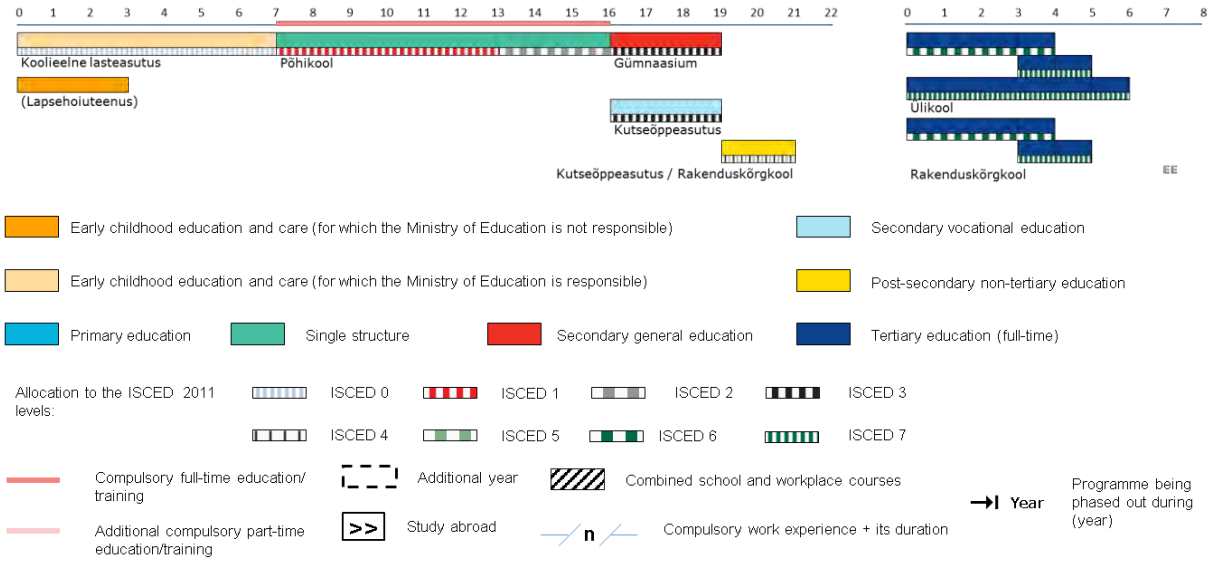
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Attila MARJAN
Attila.MARJAN@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

FINLAND

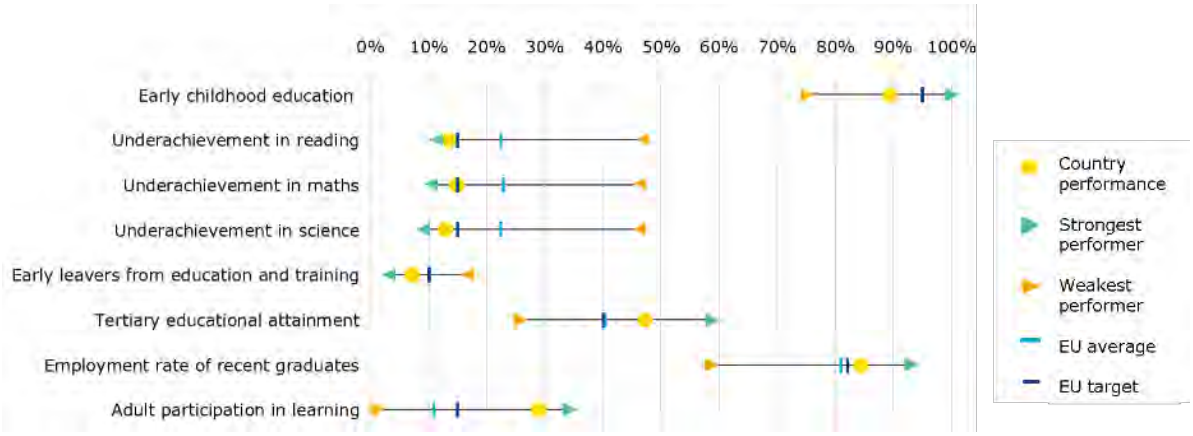
1. Key indicators

Figure 9 – Key indicators overview

			Finland		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			9.9%	7.3%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			45.9%	47.3%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			71.9%	89.3% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		8.1%	13.5% [18]	19.3%	22.5% [18]
	Maths		7.9%	15.0% [18]	22.2%	22.9% [18]
	Science		6.0%	12.9% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		77.8%	84.4%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		22.1%	29.0%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	4.1% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	15.1% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		6.5%	5.5% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€7 557 [12]	€8 030 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€6 563 [12]	€5 696 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€13 634 [12]	€12 347 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		9.3%	7.0%	12.6%	8.9%
	Foreign-born		21.8%	11.5% [u]	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		47.2%	49.1%	32.0%	41.3%
	Foreign-born		27.2%	34.8%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		72.9%	80.8%	72.2%	75.9%
	ISCED 5-8		84.1%	89.1%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs; u = low reliability; : = not available; 12 = 2012, 16 = 2016, 17 = 2017, 18=2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Digital education is well developed, with high-skilled teachers and good digital infrastructure in schools. This enabled Finland to successfully manage the COVID-19 crisis.
- Investment in education and training is recovering from budget cuts in recent years. A new funding model for higher education will be applied from 2021.
- Educational outcomes remain high despite a slight downward trend. Gaps in the performance of socio-economically disadvantaged students keep widening.
- There are challenges in providing good digital competences in vocational education and training (VET). There is high participation in adult learning, but this is much lower among those with low basic skills.

3. A focus on digital education

Digital skills are good. Finland ranks first in human capital according to the European Commission's Digital Economy and Society Index (DESI) 2020 (European Commission, 2020a). 76% of the population (aged 16-74) have basic or above basic digital skills (EU average 58 %). The gender gap in information and communications technology (ICT) skills is smaller than the EU average: 77% of women have at least basic digital skills (EU 55%) while 23% of ICT specialists are women (EU 17%) (European Commission, 2019a).

Finnish education curricula incorporate digital competences transversally into other subjects. The curricula are very detailed concerning the expected digital learning outcomes (European Commission/EACEA/Eurydice, 2019). Students are taught to use digital tools in diverse and creative ways, to collaborate and to work with data, information and knowledge. In primary and lower secondary education, part of lessons in other subjects can be devoted to teaching specific elements of digital competences. Since 2016-2017, the new curriculum for primary and lower secondary education includes ICT as a transversal competence and the syllabi of maths and craft include programming. In upper secondary, schools provide optional applied digital-related courses. (European Commission/EACEA/Eurydice, 2019). The Majakka network supports municipalities in the preparation and implementation of local curricula (FNBE, 2016). EUR 30 million were allocated in 2017 for the implementation of transversal competences, including digital ones (MEC, 2017).

Teachers have highly developed ICT skills. Teachers in Finland are currently better trained in digital subjects, have higher confidence when assessing their own digital skills level and make more everyday use of digital means for teaching than in previous years (Tanhua-Piiroinen et al., 2019). Use of ICT for teaching is part of pre-service teacher education and practice. The 2018 OECD Teaching and Learning International Survey (TALIS) (OECD, 2019a) shows a much higher proportion of teachers trained in the use of ICT than in TALIS 2013 (74% v 48%). A good command of digital competences is still more prevalent among younger and male teachers. Nevertheless, on average 19% of teachers report a high need for professional development in this area, and only 21% feel well prepared. The share of teachers who have undertaken subject-specific training on learning applications and equipment-specific training is below the EU average, but above average for those trained in the pedagogical use of ICT in teaching and learning (European Commission, 2019b). In 2016-2019, EUR 23.8 million were spent on creating 2 500 tutor teacher positions in municipalities to support teachers' use of digital technologies and to create digital learning environments (European Commission/EACEA/Eurydice, 2019; Oppiminen uudistuu, 2018).

The online self-assessment tools provided by Opeka[81] help teachers assess their digital competence and their development needs (European Commission/EACEA/Eurydice, 2019).

The use of digital means in teaching remains limited. The integration of transversal digital competences into the classroom still faces challenges (Saarinen et al., 2019). The methods used in learning still largely focus on books, notebooks and handouts, and digital tools are too often used just for completing assignments. TALIS 2018 (OECD, 2019a) reports that only 51% of teachers let students use ICT for project or class work, although this figure is much higher than in TALIS 2013 (18%). The share of students who use a computer at school for learning purposes is below the EU average at lower secondary level (44% v 52%) but above for upper secondary level (69% v 59%) (European Commission, 2019b). Tanhua-Piiroinen et al. (2019) suggest further regular evaluations of the quality of the digital learning environment and strengthening support for teachers in technical and pedagogical competences.

Digital infrastructure in schools is good. 99% of schools have access to the internet and 93% of students have an email account for school-related use (Fraillon et al., 2019). In primary schools there is currently one computer for every 2.5 pupils. In upper secondary schools all students have their own computer.

Box 1: Free online courses on basics of artificial intelligence (AI) for the whole EU

Elements of AI is a series of free online courses first launched in 2018 by the Finnish tech company Reaktor and the University of Helsinki. The initiative is also supported by the Technology Industries of Finland Centennial Foundation. The courses are designed to encourage people to learn the basics of AI, whatever their age or education. No prior mathematical or programming skills are required. It combines theory with practical exercises and can be completed at each student's own pace. Today, Elements of AI is the most popular course ever offered by the University of Helsinki. Around 500 000 people have already participated.

The Finnish Presidency of the Council of the EU in the second half of 2019 decided to invest in people's future skills and will now make the Elements of AI online course freely available in all official EU languages. Translation has been provided by the European Commission. The course is already available in, Finnish, Swedish, English, Estonian, German, Latvian and Norwegian. The goal is to educate 1% of European citizens in the basics of AI. The total cost of the initiative is EUR 1 679 000, and will be funded from the budget of the Ministry of Economic Affairs and Employment of Finland.

The courses are available at: https://www.elementsofai.com/

4. Investing in education and training

Finland is expected to make upper secondary education free of charge in 2021. Pre-primary education is free for 6-year-olds. Parents have to pay for day care according to family incomes, but fees are being reduced to encourage enrolment. Primary and lower secondary education are totally free, including meals and learning materials. Upper secondary education is free except for learning materials. Legislative changes are under way to make upper secondary education totally free by autumn 2021. This will mean that education, meals, school trips of more than five kilometres and health care are free; as well as all learning materials and equipment, including laptops. The costs of the reform is estimated for the education material alone at around EUR 72.8 million annually[82]. Stakeholders support the measure but consider that the cost of the overall reform that also includes the extension of the compulsory schooling age to 18, is

[81] http://opeka.fi/en/presentation/index

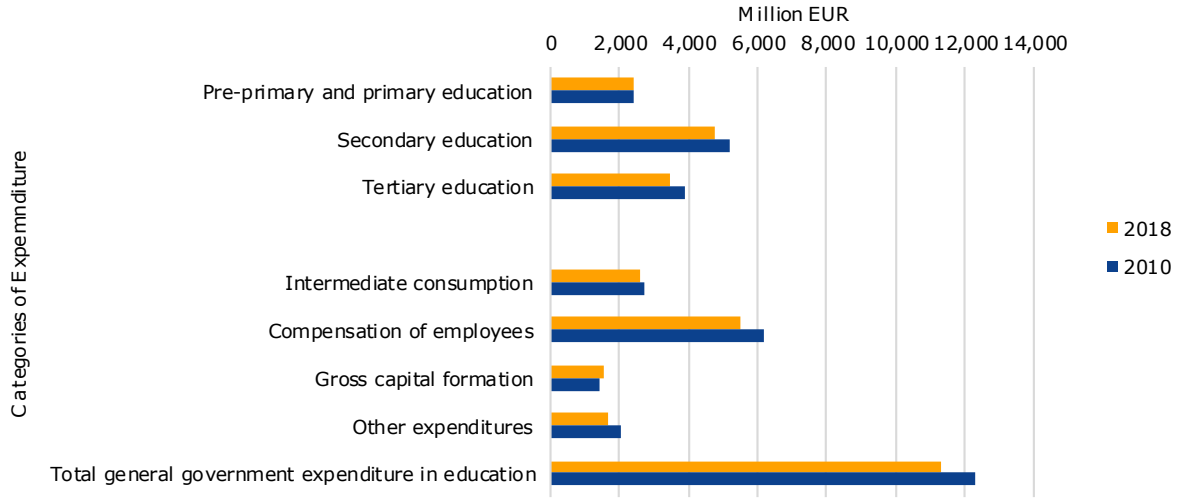
[82] Draft government proposal for a Compulsory Education Act and connected legislation https://api.hankeikkuna.fi/asiakirjat/44da6a8c-2143-4148-96de-5804d201dac9/b942eaf7-b84b-4d06-b2f9-a2e660d52c25/ESITYS_20200430114032.pdf

underestimated (Kuntaliitto, 2018; FEE, 2019[83]). Central government covers approximately 29% of the primary and secondary education budget and the rest is covered by local education providers and municipalities. Tertiary education is also free, except for learning materials. University students get study grants from the state and meals at the university cafeteria are subsidised.

Investment in education decreased over the last decade. In 2010-2018, there was a decrease in general government expenditure on education (in deflated values) of 8% (EUR 1 billion less), and of 11% (EUR 0.5 billion less) in tertiary education[84]. This contrasts with an average EU-27 spending increase of 4% (2% in tertiary education). The major real expenditure reduction in 2000-2018 took place in compensation of employees (minus 10%) while there was a 9% increase in gross capital formation (by 26%, mainly at secondary level).

In recent years, the education budget has started increasing. In 2018, the Ministry of Education and Culture allocated EUR 6.6 billion to education (Valtioneuvosto, 2017), and EUR 6.4 billion in 2019 (MEC, 2018). In 2020, the budget increased to EUR 6.9 billion[85]. In 2018, Finland spent 5.5% of gross domestic product (GDP), above the EU average of 4.6%: 3% by central government and 3.6% by local governments. In pre-primary and primary education, spending was 1.2% of GDP (1.1% by local government), at secondary education 2.3% (1.2% by central and 2% by local governments) and 1.7% in tertiary education (1.6% by central government).

Figure 3 – General government expenditure on education (in deflated values) 2010-2018



Source: DG EAC figure showing Eurostat's general government finance statistics (2018). Online data code: [gov_10a_exp].

5. Modernising early childhood and school education

Finland keeps increasing participation in early child education (ECE) and looks to further strengthen access and quality. In 2010-2018, ECE participation from age 4 to compulsory primary education increased by 16.2 pps (from 73.1% to 89.3%), still below the EU benchmark of 95%. Participation in ECE varies among regions, from 86.4% to 95.6%. A new act on ECE[86] aiming to improve access and quality was adopted in 2018. A Forum for the Development of ECE was set up in spring 2019 (MEC, 2019a). The Ministry of Education and Culture (MEC, 2019b) has made

[83] Finnish Education Employers (FEE) (3.7.2019). Oppivelvollisuusiän nostoon liittyy paljon avoimia kysymyksiä https://www.sivista.fi/uutiset/oppivelvollisuusian-nostoon-liittyy-paljon-avoimia-kysymyksia/.

[84] Eurostat: [gov_10a_exp].

[85] https://vm.fi/valtion-budjetti

[86] https://www.eduskunta.fi/FI/vaski/HallituksenEsitys/Sivut/HE_34+2019.aspx.

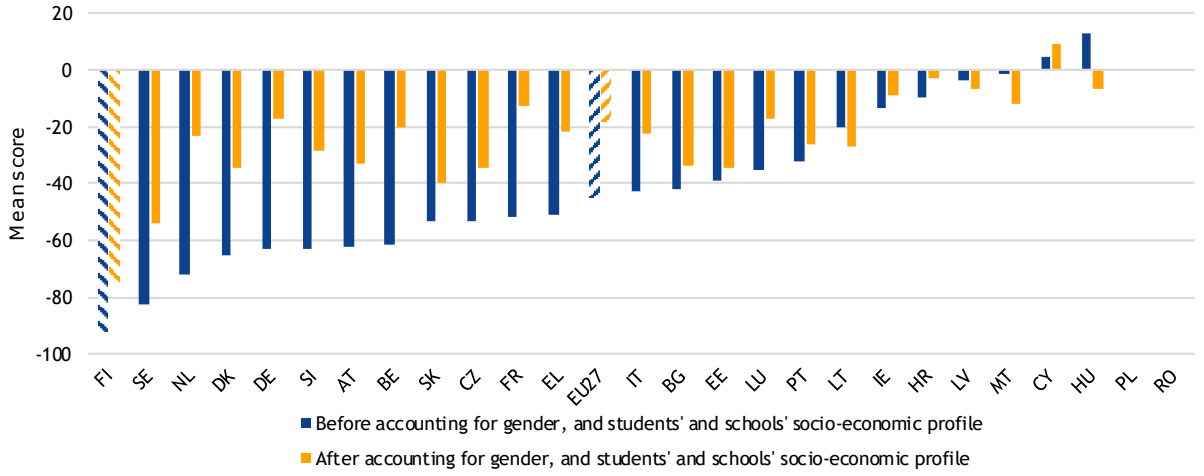
reforms to reduce group sizes from age 3 and allocated EUR 16 million annually to municipalities to fund additional costs linked to the measure. The Association of Finnish Local and Regional Authorities considers that if all ECE is to be completely free of charge, some EUR 270 million in additional funding would be needed from central government (Kuntaliitto, 2019). In 2020-2022, a development programme to strengthen access and quality of ECE will be supported with an additional budget of EUR 125 million from the Finnish government, a measure that has been positively acknowledged by the Trade Union of Education (OAJ, 2019).

Performance in basic skills remains high despite a slight downward trend. The 2018 OECD Programme for International Student Assessment (PISA) confirms that levels of basic skills remain close to the top for participating countries (OECD, 2019b). Nevertheless, there has been a negative trend in average performance; indeed, since 2006 Finland experienced the sharpest performance decrease among PISA-participating countries (OECD, 2019c). Compared to 2015, the decline is only statistically significant in science. In 2009-2018, the underachievement rate increased in all three tested subjects, while remaining below the EU benchmark of 15% in all of them (European Commission, 2019c). The percentage of top performers in reading and science is still one of the highest among PISA countries.

Girls outperform boys in all three tested subjects, yet few of them are attracted to science, technology, engineering and mathematics (STEM) careers. The performance gap in favour of girls in reading and sciences is the largest among EU countries (OECD, 2019d). About one in ten high-performing female students in mathematics or science expects to work as an engineer or science professional (one in eight boys). Almost no girls indicate an expectation to work in ICT-related professions (4% of boys).

Students' socio-economic and migrant backgrounds have a strong influence on educational outcomes and academic expectations. The gap in reading performance is closely related to students' socio-economic status, and this gap has widened since PISA 2009 (OECD, 2019c). In addition, after accounting for socio-economic status, the difference in reading performance between students with migrant and non-migrant backgrounds is the largest in the EU (74 score points). Pupils from a disadvantaged background hold lower ambitions about getting a tertiary degree than would be expected given their academic achievement (OECD, 2019d).

Figure 4 – Difference in mean PISA score in reading between students with or without migrant background, 2018



Source: (OECD, 2019c), PISA results.

The school disciplinary climate requires improvement (OECD, 2019e). In Finland, 18% of students reported being bullied at least a few times a month (EU-27 22%); 27% of students reported that their teachers have to wait a long time for students to quieten down (EU-27 28%); 13% of students had skipped a day of school (EU-27 24%); and 45% had arrived late for school in the 2 weeks prior to the PISA test (EU-27 41%). Frequent bullying among students is linked to

lower reading performance (by 7 score points); as is attending classes where teachers wait a long time for children to quieten down (by 16 score points), skipping a school day (by 60 score points) and arriving late for school (by 36 score points). These differences are close to the EU averages (8, 28, 54 and 33 score points respectively).

Finland successfully managed the challenges resulting from the pandemic. Schools and universities were closed on 18 March 2020 and in-person education replaced by distance learning (MEC, 2020a). Day-care and pre-primary schools remained open for children whose parents required and for those with special educational needs. Pre-existing resources in the education system and strong stakeholder relationships enabled the government to engage teachers, parents, students and experts in valuable discussions about emergency measures and to share their experiences (OECD, 2020a). The main education platforms for primary, secondary and VET education - Helmi, Wilma (Primus), Studentaplus and Sopimuspro - were used for giving homework, providing feedback and communicating with parents. The central administration offered support and guidance[87]. Various resources were collated to support online education from private and public entities and to develop an online information hub to guide teachers on good practices[88]. The Device for All[89] campaign encouraged private sector companies to donate laptops to students. Several Finnish EdTech companies provided e-learning-materials for free at koulu.me[90]. Face-to-face teaching in primary and lower secondary education resumed with special arrangements on 14 May. Distance education is reported to have worked well, but there is a fear that some pupils who normally need more support than others did not make as much progress as their classmates.

Finland will extend the compulsory schooling age to 18 by 2021. The preparation of the proposal to extend compulsory education is progressing (MEC, 2020a). The aim is to ensure that every student completes at least secondary education, and therefore to reduce the dropout rate[91]; as well as to increase their chances of getting a job[92]. The rate of early leavers from education and training is well below the EU-27 average (7.3% v 10.2% in 2019), but is 4.2 pps higher for foreign born pupils (11.5% in 2019) than for native born (the EU-27 gap is 13.3 pps).

6. Modernising vocational education and training

VET is a popular study path. In 2018, 71.6% of all learners at upper secondary level were enrolled in VET. VET offers good job opportunities for young students entering labour market and for adult students seeking new career opportunities. The employment rate of recent graduates aged 20-34 is 80.4%.

The COVID-19 lockdown led to a shift to distance learning. The flexibility of the VET system, based on a modular qualification structure and individual learning pathways, enabled an easy adaptation. Nevertheless, guidance, validation and entry exams were affected. The government introduced financial support packages to aid education providers affected by the shutdown.

Ensuring that all learners receive digital competence development according to their individual needs is a challenge for VET. Before COVID-19, 15% of the students used the online learning apps related to their vocational field regularly, but 28% only occasionally according to a report on the level of digitalisation (MEC, 2018b). Remote studies were completed in an electronic environment regularly by 12% and occasionally by one quarter of the respondents. The Trade Union of Education reported that a lack of teacher/trainer capacity and motivation to use new

87 Among others: Opentunti, Yle Triplet, www.amazingeducationalresources.com; aoe.fi, Finna.fi.

88 https://www.oph.fi/fi/esimerkkeja-etaopetukseen-soveltuvista-oppimateriaaleista-ja-aineistoista

89 https://www.oph.fi/fi/uutiset/2020/kaikille-kone-kampanja-haastaa-yritykset-lahjoittamaan-tarpeettomia-tietokoneitaan

90 https://koulu.me/

91 According to national statistics, 10.5% of 20-24-year-olds were not in the labour market or in education in 2019.https://www.stat.fi/til/tyti/2019/03/tyti_2019_03_2019-04-24_tie_001_fi.html

92 According to national statistics, the employment rate of students with education up to lower secondary level only is around 40%.

pedagogical solutions among VET teachers were challenges (Finnish National Agency for Education, forthcoming)

The 2019-2023 government programme aims to increase the number of students completing upper secondary education, including VET. It provides more investments: EUR 235 million have been earmarked until 2023 for hiring new teachers and trainers (Cedefop ReferNet Finland, 2019a). In November 2019, VET and general education matters were brought under one department at the Ministry of Education and Culture. This arrangement aims to strengthen the cooperation between the two strands (Cedefop ReferNet Finland, 2019b). In June 2020, the Ministry of Education and Culture launched a three-year programme (2020 – 2022) for quality and equity in VET.

A VET quality strategy until 2030 is being prepared. It replaces the 2011 strategy and aims to ensure comprehensive quality management in VET institutions by applying customer-oriented approaches and clear targets, including for system efficiency (Cedefop ReferNet, 2020).

In order to enhance skills matching, at the end of 2019 a big data project developed automatic collection and analysis of qualification requirements for adults (Finnish National Agency for Education, forthcoming). Furthermore, in 2020 the Finnish National Agency for Education started work on including optional competence modules in sustainable development, financial literacy and economic know-how in the upper secondary VET curricula.

Box 2: Digital learning environment for homecare

The DigiHOP project run by WinNova, a vocational education provider, developed a digital learning environment for practical nursing education. The aim was to create interactive digital methods for learning at home. Two objectives were set for the project: to develop new pedagogical methods and to provide new professional skills for modern home care services.

Students in practical nursing education in western Finland carried out digital 'home visits' to volunteering older people – a total of 658 such home visits in a 5-week period. 15 student groups and 403 students took part in the activities.

Based on the feedback from students, the new learning environment offered versatile possibilities for learning and carrying out the home visits and was useful for developing professional skills. The students had genuine interaction with the elderly that helped develop their professional interaction and monitoring skills. Digital technology contributed to intergenerational encounters in a homecare learning environment. The model for homecare training could be transferred to other learning institutions.

The project was funded with EUR 441 000 (EU + national co-financing) from the Mainland Finland OP. Duration of the project was from February 2016-December 2018.

7. Modernising higher education

The Vision for Higher Education and Research 2030 is being implemented. The government set three main objectives for higher education by 2030: providing 50% of the total young adult population (aged 25-34) with a tertiary degree; playing a major role in adult learning; and increasing access to and equality in university studies. In 2017, 55% of first-time entrants to universities of applied sciences had a vocational degree, 9% for other universities (MEC, 2019c). 47.3% of adults (30-34) in Finland hold a tertiary level degree (EU-27 average 40.3%). This rate has increased by 1.4 pps since 2009 (45.9%). Higher education institutions are encouraged via the new funding model to develop adult education through continuous learning possibilities. The number of available student places at universities must meet the needs of society and be based on

employment forecasts for each sector and region[93]. The limited number of places in certain regions make it particularly difficult to enter university there. For instance, in the Uusimaa region (i.e. the extended Helsinki metropolitan area) there is a major shortage of study places and a growing demand (European Commission, 2020b). Around two thirds of university applicants are rejected annually; this delays tertiary education for several years for many students. Higher education policy needs to incentivise their role in knowledge transfer more strongly.

Higher education students take a long time to get a degree. The average duration of tertiary education is 6.5 years, causing a considerable delay in labour market entry. Less than half of university graduates complete their degree within the target time in all fields (for humanities and arts less than 20%), except for health and well-being (58%) (MEC, 2019c). After seven years, about 70% of university beginners in 2010-2011 had a bachelor's or master's degree from a university, more than 16% were still studying, and 6% of students had neither a university degree nor keep studying (MEC, 2019c).

The conditions for student admission to university studies changed. From spring 2020, students will be mainly selected based on national matriculation examination grades, which is a biannual, high-stakes final `test´ that takes place at the completion of general upper secondary studies[94]. Student selection to universities of applied sciences already changed in 2019: applicants can apply to different study field with the same entry test and select up to six destinations (Arene, 2019). An applicant can also apply to different universities and disciplines via either the matriculation examination or through a single institutional entrance exam specific to certain universities and studies. While entrance exams are being modified so that they do not require lengthy preparation[95], upper secondary students seems still prefer to attend private training courses to get better prepared for them[96]. In addition, since students do not know their matriculation examination outcomes early enough, they may also have to prepare for the entrance exam as well, just in case[97].

The new funding model for higher education institutions will be applied from 2021. Universities of applied sciences will receive 6% (currently 4%) of their basic funding based on the number of graduates that enter into employment and the quality of their employment. For the other universities, it will be 4% (currently 2%). This will increase funding based on continuous learning indicators for universities of applied sciences from 5% to 9%, and for the universities from 2% to 5%. In 2019, the employment rate of recent tertiary graduates (1-3 years after graduation), aged 20-34, was 89.1%, above the EU-27 average (85.0%), and higher than in 2018 (88.3%).

The COVID-19 pandemic also affected higher education but to a lesser extent. Higher education institutions have various tools available for distance learning, such as their own learning management systems (Moodle, etc.), and commercial streaming services. Distance learning was the norm in higher education institutions from March and continued until the end of term. Finnish universities agreed that traditional institutional entrance examinations could not take place; each institution introduced its own entry procedures. The first spring call of joint examination for universities of applied sciences was cancelled; students were admitted based on school performance and selection assignments. For the second call, online selection mechanisms were used (OECD, 2020a).

93 https://www.oph.fi/fi/palvelut/osaamisen-ennakointifoorumi-oef
94 See additional information at: https://minedu.fi/en/faqs-about-student-admissions
95 Korkeakoulujen valintauudistus on herättänyt hämmennystä viestinnän ja aikataulutuksen epäselvyyden takia https://www.hs.fi/paakirjoitukset/art-2000006183548.html.
96 Pääsykokeiden uudistuksen piti vähentää valmennuskursseja, mutta miten kävi? Lukiolaisille myytyjen kurssien määrä moninkertaistui]. Yleisradio https://yle.fi/uutiset/3-11197125.
97 Kukaan ei vielä tiedä, mitkä arvosanat riittävät korkeakoulupaikkaan – tuhannet opiskelijat pänttäävät nyt varmuuden vuoksi myös pääsykokeisiin Yleisradio https://yle.fi/uutiset/3-11221246.

8. Promoting adult learning

Participation in adult learning in Finland is the second highest in Europe, yet some challenges exist. 29% of all adults aged 25-64 engaged in learning in 2019. However, there are still challenges, like improving learners' disposition towards learning and ensuring a comprehensive adult learning system with the right incentives and support services to all. According to the OECD (2020b), Finland has the largest gaps in learning participation between adults with low basic skills and those with higher skills, and there are considerable gaps in upskilling and reskilling opportunities.

New proposals were adopted regarding the validation of non-formal adult education. In December 2019, a working group coordinated by the Ministry of Education and Culture prepared a report with recommendations to include non-formal adult education provision in the national digital database of qualifications and certificates, Koski, by September 2021. This will also involve creating a more structured description of learning outcomes in different areas of non-formal adult education. The process will be coordinated by the National Board of Education, including funding for pilot projects, training of teachers and other staff and developing guidelines (MEC, 2019d).

A parliamentary working group on the development of the continuous learning concept continues its work, and it is on track to deliver its proposals by the end of 2020. The government asked the Ministry of Education and Culture to produce an educational policy report by the end of 2020. This snapshot of the current education system will serve as another tool for reshaping Finnish educational policy, including adult learning.

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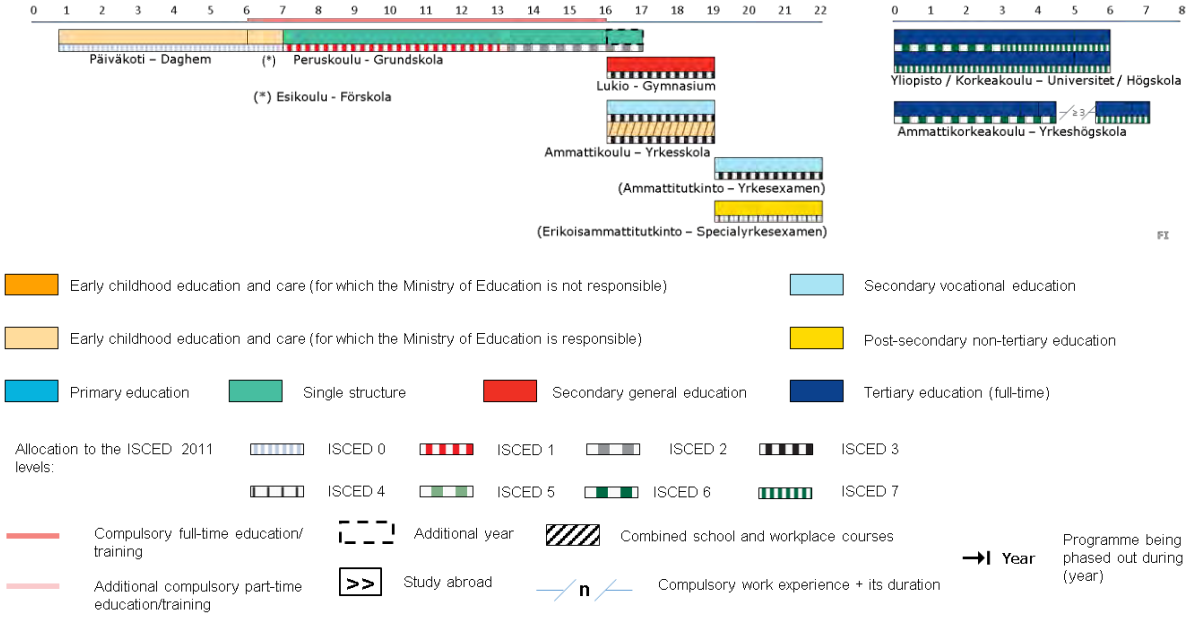
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Antonio GARCIA GOMEZ
Antonio.GARCIA-GOMEZ@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

European Commission

FRANCE

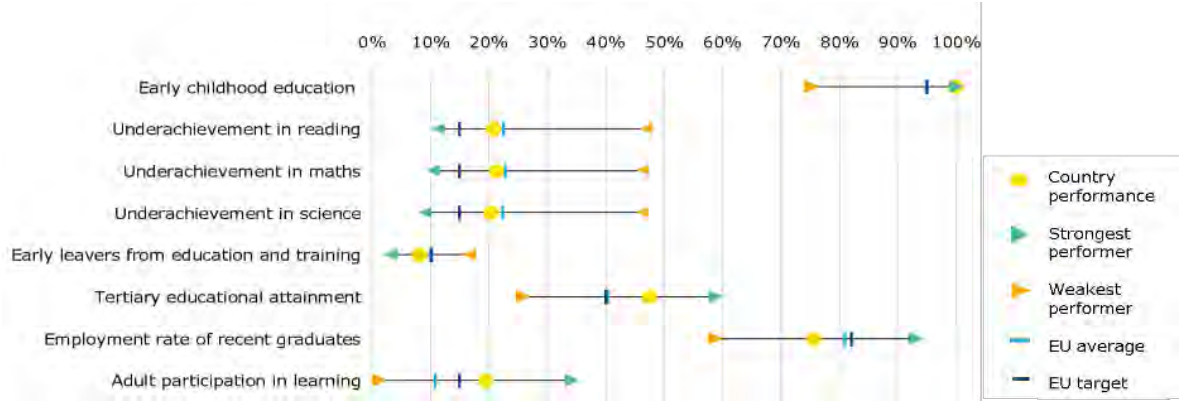
1. Key indicators

Figure 10 – Key indicators overview

			France		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			12.4%	8.2%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			43.0%	47.5%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			100.0%	100.0% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		19.8%	20.9% [18]	19.3%	22.5% [18]
	Maths		22.5%	21.3% [18]	22.2%	22.9% [18]
	Science		19.3%	20.5% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		77.3%	75.7%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		5.7%	19.5% [b]	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	3.5% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	14.6% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		5.7%	5.1% [p, 18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€6 122 [12]	€6 700 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€9 895 [d, 12]	€10 190 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€11 556 [12]	€11 845 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		11.6%	7.8%	12.6%	8.9%
	Foreign-born		24.3%	13.4%	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		44.3%	47.9%	32.0%	41.3%
	Foreign-born		34.1%	45.4%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		69.0%	65.2%	72.2%	75.9%
	ISCED 5-8		83.4%	82.0%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs, p = provisional, : = not available, 12 = 2012, 16 = 2016, 17 = 2017, 18 =2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Recent measures aim to strengthen the digital competences of students and teachers and to stimulate pedagogical innovation.
- Reforms in pre-primary and primary education to improve educational outcomes and reduce inequalities continue.
- Socioeconomic and regional disparities in basic skills of 15-year-olds remain high, but France has taken some measures to mitigate additional educational inequalities resulting from the COVID-19 lockdown.
- The 2018 reform continues to steer developments across vocational education and training (VET).

3. A focus on digital education

The 2015 digital strategy for education *(Plan numérique pour l'éducation)* aims to strengthen students' digital competences, teachers' professional development and to stimulate pedagogical innovation. School data collection and links with new stakeholders outside the school also underpin the digital strategy (Eurydice, 2019). Pedagogical innovation focuses on reducing inequalities and supporting students' outcomes. Many digital platforms support these objectives (see Box 1). Since 2019, the French framework for digital competences sets out those to be achieved from primary to university level and their evaluation at the end of each cycle. A new mandatory `digital and technological sciences´ course in grade 10 and optional courses in grades 11 and 12 of general education should strengthen students' digital skills. New teachers entering the profession need digital certification, and a new master's degree in digital education should provide necessary numbers of specialised teachers (see below).

Digital skills of young people show average results, but seem to be improving. In the 2018 International Computer and Information Literacy Study (ICILS), French pupils in grade 8 (ISCED 2) scored just above the ICILS average of participating countries on computer and information literacy (CIL) (499 v 496 points). More 16-19 year-olds reported having above basic overall digital skills in 2019[98]: 62% compared to 57% in 2015, close to the average trend in the EU (57% and 52%, respectively). National data on digital skills competences are not yet available.

There is evidence of a digital divide by gender and pupils' socio-economic status. Girls outperformed boys in CIL (24 points) across all achievement levels, as was the case in all participating EU countries. Male underachievers particularly outnumbered females (49.2% v 37.8%). Socioeconomic background, migrant status and language spoken at home seemed to influence pupil achievement, echoing the pattern in the OECD Programme for International Student Assessment (PISA) results (see below). French students also scored at the EU average on computational thinking (CT), where boys performed better than girls, but this result was not statistically significant. The ICILS study also shows that CIL and CT are well covered in the national curriculum.

France has invested substantially in digital infrastructure and equipment for schools (EUR 2.3 billion over 2013-2017). Investment increases according to the level of education (French Court of Auditors, 2019). As a result, in 2017/2018 there were fewer highly digitally equipped and connected schools at primary level than the EU average (14% v 35%), lower secondary was in line with the EU average, and higher secondary level was above it (81% v 72%). The share with high-speed internet connectivity at all education levels is still lower than the EU average (European Commission, 2019a). The Court of Auditors (2019) recommended that future investments should be better linked to teacher training, innovative pedagogies, new pilot projects and use of artificial intelligence (AI) for education.

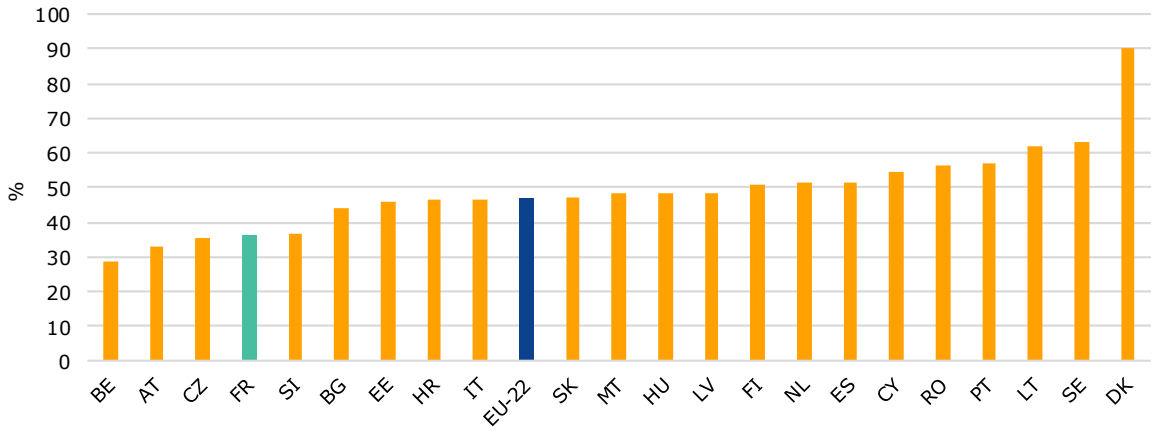
[98] isoc_sk_dskl_i

To further broaden access to higher education and reduce territorial inequalities, 31 connected campuses are operational in 2020/2021 in cities distant from large universities (MESRI, 2020a). The campuses offer innovative third-level spaces where distance learning is provided with tutoring by qualified staff. Local authorities make infrastructure available for these and central authorities allocate funding. The objective is to establish 100 connected campuses by 2022.

France is harnessing the potential of AI for education. A partnership with the private sector will develop pedagogical resources based on AI to support teachers with differentiated and personalised learning of French and mathematics in grades 1-3 of primary education. A voice assistant to learn English in primary education will be tested in 2020 as part of the modern languages plan (MEN, 2019a). A working group of AI researchers in the National Education Council will also support educational innovation. Four multidisciplinary Artificial Intelligence Institutes (*Instituts Interdisciplinaires d'Intelligence Artificielle (3IA)*) are developing research, training and innovation clusters in specific fields, involving the creation of 150 Chairs in AI (MESRI, 2019a).

Teachers' digital skills are crucial if digital skills of students are to be improved. The share of schools with existing school strategies to use digital technologies and which strongly promote teachers' professional development is lower than the EU average at all education levels (European Commission, 2019a). The share of teachers participating in ICT skills training grew from 39.8% in 2013 to 50.2% in 2018. However, more teachers (22.9%) than the EU-22 average (18.0%) reported a need for this type of training (TALIS, 2018). Recent initiatives to increase teachers' digital skills include mandatory digital qualifications in the Education Master and in the recruitment procedure of teachers (*CAPES*). In 2019, over 2 000 teachers have already obtained the new Interuniversity Diploma (*Diplôme Interuniversitaire, DIU*) to teach ICT in upper secondary schools and more than 13 000 have registered for a new MOOC since February 2019 (MEN, 2019a). This could positively impact the currently low level of teachers letting students use ICT for projects or class work (36.1% v EU-22 46.9%) (See Figure 2) (TALIS 2018). The ministry set up an online platform, DANE, to support teachers in many ways during the COVID-19 crisis. This may have helped to partly address their lack of preparedness for digital teaching reported in TALIS 2018. Distance education during the school closure was also managed in a decentralised manner, offering autonomy to school heads and teachers.

Figure 3 - Percentage of lower secondary teachers who reported that they `frequently´ or `always´ let students use ICT for projects or class work



Source: (OECD, 2019), TALIS 2018 Results (Volume I).

Distance learning during the COVID-19 crisis has likely increased gaps in educational outcomes. It is estimated that 6% of pupils in primary education and 10% in secondary education became disengaged from study (DEPP, 2020a). Schools reopened on May 18 to mitigate school dropout and socioeconomic inequalities. Measures taken during the closures included: providing digital equipment to vulnerable pupils; mentoring and tutoring through voluntary networks and the

redeployment of 25 000 volunteers from the Civic Service; an online platform (*Je veux aider*); and additional funding to local associations (OECD, 2020a).

Box 1: Digital platforms eased the transition to distance learning during the COVID-19 lockdown

France has invested strongly in digital platforms for education and training in recent years. More pupils in grade 8 (65%) than on average in ICILS participating countries (56%) are enrolled at schools with an effective online learning platform. The National Centre of Distance Learning (CNED) provided learning modules during lockdown. It also developed the Homework Done (*Devoir Faits*) and Jules platforms to provide assistance in French and mathematics. The D'COL platform supports students in priority zones in mathematics in fourth to sixth grades, and provides unlimited access to personalised assistance. Teachers in the first and second grades of primary school in disadvantaged zones have a platform to exchange pedagogical practices and other useful information. Inclusive School Cap assists teachers working with disabled students. The Innovative Digital Schools and Rurality projects (ENIR) support digital innovation in schools in communities of fewer than 2 000 inhabitants. The M@gistère scheme offers around 400 free training courses to teachers. The ÉTINCEL platform, developed in partnership with industry, offers digital resources for professional and technological education to support career guidance and better preparation for the workplace. These platforms have reportedly eased the transition to distance learning during the COVID-19 crisis (OECD, 2020a).

In higher education, the PARCOURSUP platform informs and facilitates access to higher education.

PIX, a free online public service to assess, develop and certify digital competences for pupils, higher education (HE) students and workers was set up. It can be used by companies to plan staff training actions. Between 2017 and 2019 some 50 000 digital certificates were issued by the National Directory of Professional Certification and 300 000 unique PIX accounts created (Cedefop ReferNet, 2020 and Centre Inffo, 2020a).The digital lab, 110 BIS, is a platform for innovation, exchange and experimentation in digital education. ProFan is a 5-year (2016-2020) pilot running in upper secondary VET schools to test and develop new digital competences for future jobs and project networking between learners and teachers.

4. Investing in education and training

Public expenditure on education increased in real terms by 3.1% between 2010 and 2018, slightly below the 3.3% average increase in the EU. In 2018, it accounted for 9.1% of total public expenditure (EU average 9.9%). As a proportion of GDP, public education expenditure, at 5.1%, remained above the EU average of 4.6%. The funding share for pre-primary and primary education has increased since 2010 (28.3% v EU-27 34.1% in 2018), even as pupil numbers at this level have decreased since 2015. Spending on secondary education remained above the EU average (39.7% v 37.1%), but decreased between 2010 and 2018 (-7% v EU average -1%). In 2016, the share of private funding in total educational expenditure (12.6%) was slightly above the EU-23 average of 11.8%, reaching 21.3% (23.7%) at tertiary level[99] (OECD, 2019d).

Strengthening pre-primary and primary education and tackling inequalities are budget priorities in 2020. Maintaining the 2019 budget priorities (European Commission, 2019b), the EUR 991 million 2020 budget increase for compulsory education will allow: a gradual move to maximum class sizes of 24 pupils in third pre-primary grade and the first 2 years of primary education; avoidance of school closures in rural areas; splitting classes in the third pre-primary grade of high priority education areas (REP(+)[100]), affecting up to 150 000 pupils; and accommodating an additional 26 000 pupils as a result of lowering the mandatory school age to 3

[99] Table C3.1.

[100] REP(+): Réseaux d'éducation prioritaire (renforcés).

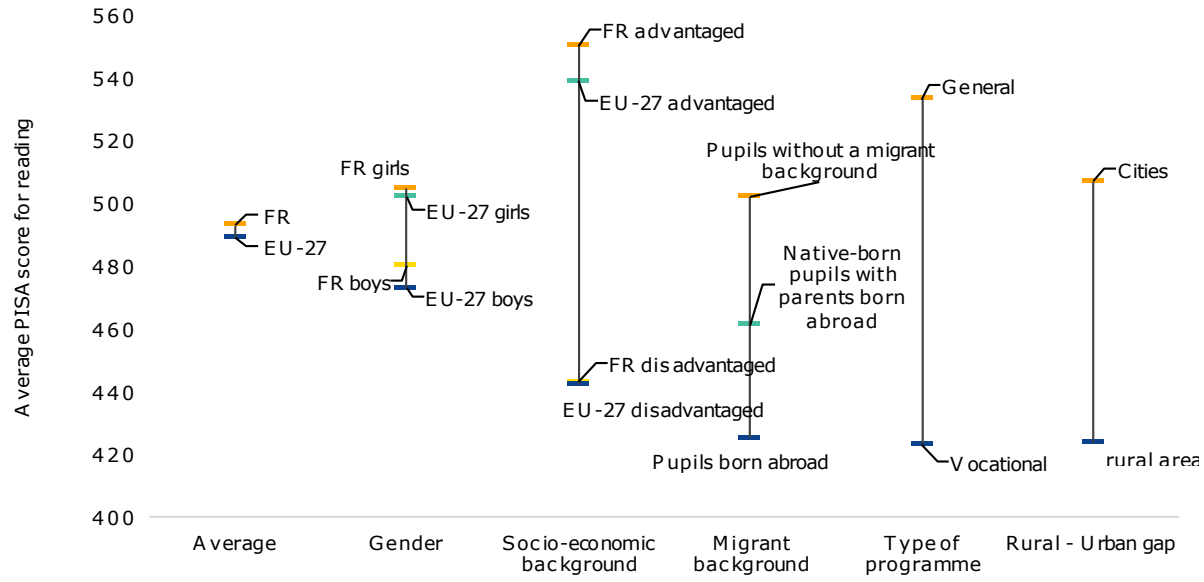
(MEN, 2020a). For this, an additional 1 688 teaching posts will need to be created in primary education, even though the pupil population in pre-primary and primary education is expected to fall by 50 000 in 2020. Social support to vulnerable pupils will also be increased. Additional support for pupils with a disability, 8 000 new support staff and better working conditions are also budgeted to promote inclusive schools (+EUR 237 million).

5. Modernising early childhood and school education

The basic skills' levels of students are slightly above the EU average. The 2018 PISA shows that France has relatively good educational outcomes**.** The performance of 15 year-olds remained stable and the proportions of low achievers in all three areas tested (reading, mathematics and science) were just below EU averages (see key indicators). However, pupils in vocational education underperformed relative to those in general high schools by 110 score points in reading, equivalent to more than 2.5 years of schooling.

There are strong socioeconomic and territorial inequalities (OECD, 2019a)**.** There is a wide performance gap in reading between pupils from advantaged and disadvantaged backgrounds (at 107 points in 2018; EU average 97 points) and this gap has remained largely unchanged since 2009. France ranks fourth in the EU on how strongly socioeconomic status predicts performance in reading (it explains 17.5% of the variation). Differences between students from urban and rural areas were also large (83 points, equivalent to two grades).

Figure 4 – Average PISA score for reading, by gender, socioeconomic and migrant background, type of programme and location, PISA 2018



Source: OECD (2019), PISA 2018. Note. 40 PISA points corresponds to almost one year of schooling

French students report the highest feeling of not belonging at school (61.9%). The feeling of not belonging is widespread and, according to the OECD, reduces the motivation to learn (OECD, 2017). However, after accounting for pupils' and schools' socioeconomic profiles, it is associated with only a 5-point reduction in pupils' reading performance**.**

As in other countries, bullying has a high negative impact on reading outcomes. Bullying – one out of five students are bullied at least a few times a month (19.8%; EU average 22.7%) – is linked to a performance gap equivalent to half a year of schooling (18 points). The performance gap related to students' exposure to bullying interacts with differences related to advantaged and

disadvantaged schools[101]. This 88 points' performance difference is above the EU average of 70 points, suggesting that stronger anti-bullying policies at school level could be effective in raising reading performance.

Summer camps may have helped alleviate damage to educational outcomes stemming from the school lockdown. A 'Learning Holidays' programme targeting one million children aged 6-16 was set up this summer (EUR 200 million). Summer camps and schools received subsidies to organise programmes all over the country to reduce the likely increase in the attainment gap and the risk of dropping out due to the lockdown (MEN, 2020b, 2020c).

France is performing relatively well in reducing early school leaving (ESL). From 2020/2021, compulsory training will be extended from 16 to 18 years. The rate of young people (18-24) leaving education and training (ELET) stood at 8.2% in 2019, which is below the EU and national targets (EU less than 10%; France less than 9.5%). The reduction of 4.5 pps from 2010 to 2019 compares favourably to the EU average drop of 3.6 pps. However, regional disparities remain high between the outermost regions (18.5%) and the best performers such as Brittany (5.8%), Auvergne (6.4%) and Ile-de-France (6.6%). France has implemented a 'whole system' approach to ESL ('All Mobilised to Overcome Early School Leaving') since 2014, involving regional authorities and focusing on prevention, intervention and counselling (European Commission, 2019c). More emphasis has been placed on VET in the fight against ELET - the 2018 reform of VET and apprenticeships is expected to help reduce it further (see below and European Commission, 2018). From the school year 2020/2021, compulsory training will be extended from 16 to 18 years through either education, training, apprenticeships, employment, civic service or through a social or professional integration scheme (2019 Law for a school of trust).

Policies focus on tackling inequalities in educational outcomes from an early age. First findings on the impact of lowering the age of starting compulsory education from 6 to 3 (2019 Law for a school of trust) show that participation in pre-primary education increased by 0.7 p.p. to 97.2% from 2018 to 2019 (DEPP, 2020b). Language acquisition is considered key to boosting learning outcomes; providing pre-primary teachers with supporting pedagogical materials and training is intended to help increase preparedness for mathematics and language learning in primary education (MEN, 2020d). Additional teachers will be recruited to reduce class sizes in the third pre-primary year. Additional continuing professional development (CPD) for teachers in REP+ areas and closer contacts between teachers and parents could help ensure that the reforms have full effect.

Halving class sizes in the first two grades of primary education in disadvantaged schools between 2017 and 2019 shows first positive results. National assessments in French and mathematics in the first and second grades show that gaps between pupils from disadvantaged (REP and REP+ areas) and other schools have slightly decreased (DEPP, 2020c, 2020d and 2020e).

The reform of the end of high school examination ('baccalaureate) will be fully implemented by June 2021. The reform aims to better prepare students for higher education, evaluate them over a longer period, and simplify the exam (European Commission, 2018). Due to the COVID-19 lockdown, the 2020 baccalaureate exams were replaced by evaluation based on continuous assessment. In grade 11, the second continuous evaluation session of the new 2021 baccalaureate has been cancelled and the modalities for this element are expected to be revised (MEN, 2020e) to take into account criticisms by the teachers' unions.

Steps have been taken to improve the initial training and CPD of teachers. National surveys and TALIS 2018 results have indicated that teachers considered the CPD on offer to be insufficient and of low quality (European Commission, 2019b). From 2019, the new National Higher Education Institutions (*INSPE)* are focusing strongly on pedagogical training to ensure training quality throughout the country and on adapting training to recent educational research and practice (*Référentiel - Former l'enseignant du XXIe siècle*). A masterplan 2019-2022 for CPD aims to train

[101] Table III.B1.2.7

all national education personnel on recent education policy reforms, to improve their professional practices and to support their careers.

6. Modernising vocational education and training

In 2018, 39.3% of learners were engaged in vocational pathways, against the 48.4% EU average. The employment rate of VET graduates fell from 72.2% in 2018 to 68.8% in 2019, significantly below the 79.1% EU average.

The 2018 reform continues to steer developments across VET. The reformed upper secondary VET path started in September 2019 with new schedules, new pedagogical organisations focusing more on progressivity of learning and on a better link between vocational and general subjects, with more career guidance in the last year and new classes (*prépa-métiers*) to give learners an insight into different economic sectors. The Training Centres for Apprentices (CFA) became training organisations whose financing will depend on numbers of signed apprenticeship contracts. Creation of private, employer-led CFAs is now possible. In 2020, 1 800 CFAs compared to 965 previously, report that they are delivering or planning to deliver apprenticeships; however, the COVID-19 crisis may have affected recruitment of new apprentices. The government introduced measures to support apprenticeship, including financial incentives for firms to hire apprentices. Regions have stepped up their leading role in informing schools and universities about occupations and training programmes (including apprenticeships). Starting in 2017, 3-year pilots were run in metropolitan France to encourage transition from upper secondary VET to higher technician programmes. Classes to facilitate the transition from vocational baccalaureate pupils into higher education, and career guidance scheme for baccalaureate holders run by VET schools, have been in place since 2018 (MEN, 2018) (Cedefop Refernet, 2020).

Excellence in VET is being promoted through the launching of new 'Trades and qualifications campuses' that encourage international cooperation. The first 23 excellence campuses in key sectors of the economy were announced in 2020 (MEN, 2020f). By 2022 'excellence' campuses will be set up in each region (Cedefop ReferNet, 2019, 2020). The European Commission's Structural Reform Support Programme currently supports the launch of new campuses and the upgrading of existing ones. The Investment Plan for the Future (*Programme d'investissement d'Avenir- PIA*) will fund 20 to 30 projects in 2020 (EUR 80 million).

During the COVID-19 pandemic, digital learning increased. Rules were eased to allow flexibility on fees and remuneration when training was cancelled or suspended (Centre info, 2020b).

7. Modernising higher education

In 2019, 47.5% of 30-34 year-olds had a tertiary education, above the EU average of 40.3%. The number of students enrolled in tertiary education grew by 12% from 2013 to 2018, among the highest growth rates in the EU. However, numbers in PhD studies fell (-4.9%). The employment rate of recent graduates (82.0% in 2019[102]) was the fifth lowest in the EU (EU average 85.0%). Adults with a master, doctorate or equivalent qualification have a higher earnings premium in the labour market than in many other Member States - +110% more than individuals whose highest attainment is upper secondary in 2017 (+74% more in the EU-23) (OECD, 2019b). France has announced reforms to increase the use of administrative data for graduate tracking in HE and VET (European Commission, 2020a).

During the COVID-19 crisis, higher education institutions (HEIs) used their Learning Management Systems platforms and support services for digital pedagogy to roll out distance learning. HEIs estimate that around 5% of students were unable to access distance learning. The ministry is supporting projects to further develop distance or blended learning by

[102] Eurostat: [edat_lfse_24].

HEIs for the academic year 2020/2021, with a priority focus on delivering for the first year of higher education (EUR 40.7 million)(MESRI, 2020b).

The Choose France strategy aims to welcome 500 000 foreign students by 2027[103]. French universities perform strongly in International Orientation and Teaching & Learning (U-Multirank, 2020). HEIs attracted 358 000 foreign students in 2019, of whom 75% were from outside Europe, mainly from Africa and Asia. Among PhD students, 40% were foreigners in 2017. However, 58% of mobile doctorate holders are employed abroad 3 years after obtaining their doctorate (MESRI, 2019b). The draft research programming Law for 2021-2030 will aim to make the research profession more attractive for doctorate holders.

Employers' surveys show that a lack of skills is the main barrier to hiring. According to the 2018 CEDEFOP Skills forecast, 54% of new job openings in France in 2016-2030 will require a high level of qualification, compared to 43% at EU level. Nevertheless, the share of science, technology, engineering, and mathematics (STEM) tertiary graduates slightly declined from 27.7% in 2010 to 25.4% in 2018.

Box 2: European Social Fund (ESF) project Digital training at the École Centrale de Marseille

This high-level engineering school organises short training courses in web programming for low-skilled people from specific priority areas in Marseille. The project's originality lies in the combination of practical training and the encounter between unemployed and unqualified people with students from selected streams. The school also helps these students find a job and forge links with businesses. Challenges for the school are to limit absenteeism and dropout. The EUR 529 898 project (EUR 243 742 from the ESF) started in 2017 and runs for 3 years.

https://www.europe-en-france.gouv.fr/fr/projets/se-former-au-numerique-lecole-centrale-de-marseille

8. Promoting adult learning

Between 2018 and 2019, adult participation in learning increased from 18.6% to 19.5%, placing it well above the EU average of 10.8%. Moreover, 7.9% participation among low qualified adults compares favourably to the EU average of 4.1%. The individual learning account (CPF)[104] that makes the individual responsible for her/his learning pathway is the main vehicle to provide training opportunities for (re)entry to the labour market or occupational mobility. CPF was digitalised, providing common online[105] access for companies and beneficiaries to training opportunities including apprenticeships and distance learning. Within the 2018-2022 skills investment plan, distance learning is being developed (250 000 digital courses are planned) targeting especially those not in employment, education or training and low qualified job seekers (Cedefop ReferNet France, 2018a). However, the economic crisis caused by the COVID-19 pandemic puts renewed focus on helping people at risk through more direct measures beyond online training. Free professional guidance for job seekers is offered at regional level by institutions designated by law (including the public employment service) and for employees by bodies following a call for project from the national institution for vocational training *(France Compétences*).

In November 2019, the Ministry of Economy conducted a survey on the digital competences of the French population. The results show that 54% of French adults are self-taught, 41% of low-income people have never learned to use digital tools and 48% want to be trained. On average, a third of French people feel that they have little or no competence to use a computer (MEF, 2020). The *Cléa certificate*, in place since 2015, targets unqualified adults wishing

[103] European Commission, 2019b.

[104] The *Compte personnel de formation*, a personal right to training scheme in place since 2015, was adapted to the new governance and financing system of continuing training.

[105] https://www.moncompteformation.gouv.fr/espace-prive/html/#/

to certify their key competences. A new interprofessional certificate on basic digital skills, *CléA numérique* was launched in 2019. *GEN*, a government initiative to develop digital skills, targets people with no or low qualifications and people from disadvantaged urban areas - but is open to any educational profile. (Cedefop ReferNet, 2020).

The public employment service (PES - *Pôle Emploi*) amended its strategy on training offers and improved guidance to jobseekers and support to companies. This happened in response to the 2019 European Semester country-specific recommendation (CSR) to France on skills shortages and mismatches. PES offers online services: an online platform of digital services and prototypes for project collaboration and design; *Mon potentiel professionnel*, offering personalised support to registered job seekers; and *Focus compétences*, providing online seminars in small groups on skills identification. The 2020 CSR repeated the importance of promoting skills.

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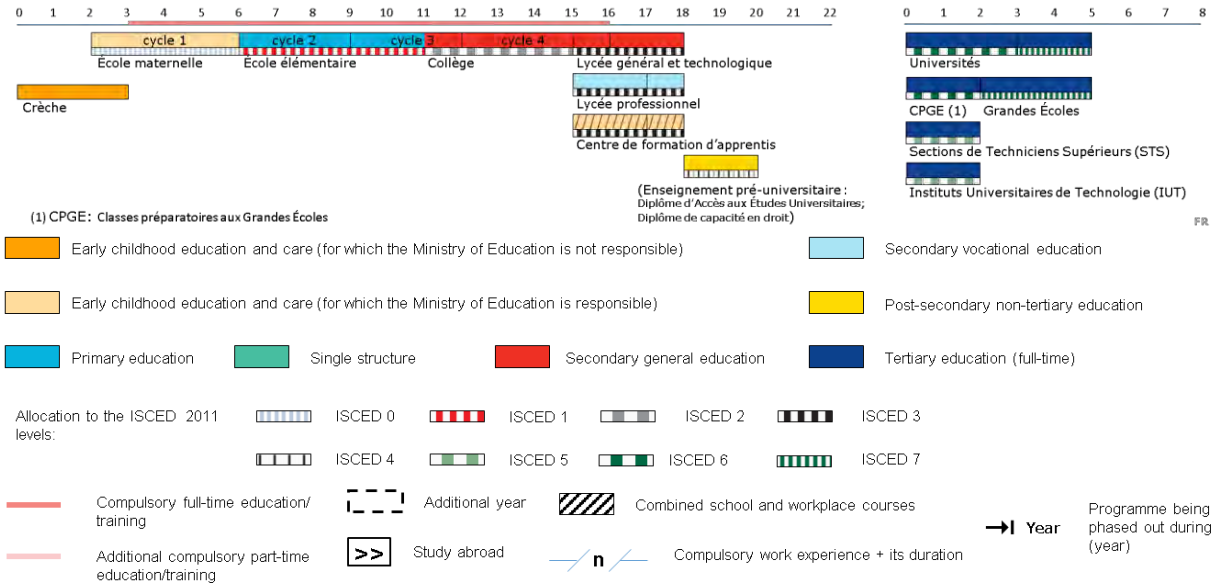
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Brigitte DEVOS
Brigitte.DEVOS@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

GERMANY

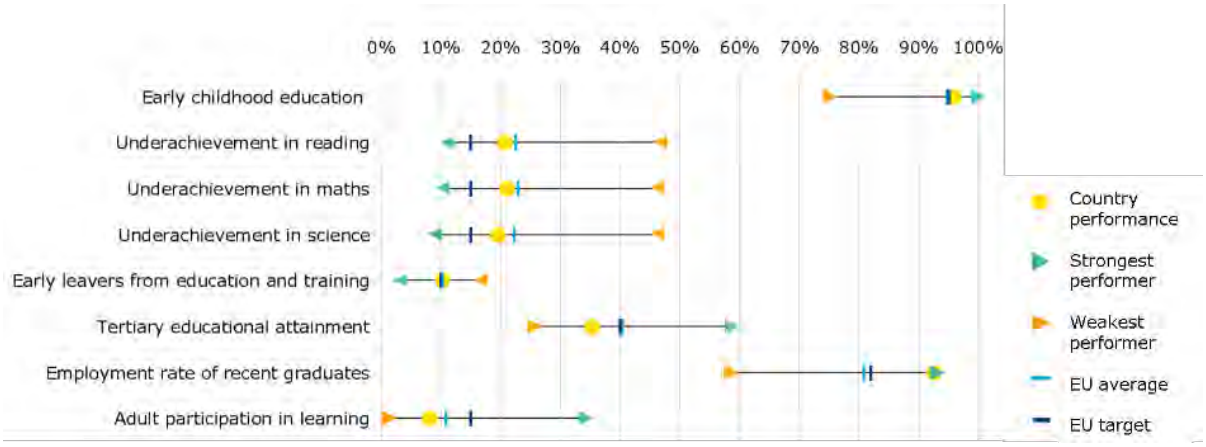
1. Key indicators

Figure 11 – Key indicators overview

			Germany		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			11.1%	10.3%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			29.4%	35.5%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			96.0%	96.0% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		18.5%	20.7% [18]	19.3%	22.5% [18]
	Maths		18.7%	21.1% [18]	22.2%	22.9% [18]
	Science		14.8%	19.6% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		85.3%	92.7%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		8.0%	8.2%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	5.3% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	14.5% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		4.3%	4.2% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€6 664 [12]	€7 663 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€9 058 [12]	€10 291 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€12 956 [12]	€12 874 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		9.5%	8.1%	12.6%	8.9%
	Foreign-born		22.0%	24.2%	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		31.0%	35.9%	32.0%	41.3%
	Foreign-born		23.9%	34.2%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		81.0%	91.0%	72.2%	75.9%
	ISCED 5-8		92.9%	94.7%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs, : = not available, 12 = 2012, 16 = 2016, 17 = 2017, 18 = 2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Despite substantial investment under the Digital Pact, gaps remain in the digital infrastructure of schools and digital skills of teachers.
- Germany is modernising vocational education and training (VET) and invests in upskilling and reskilling to prepare for future challenges.
- Due to an increase of students and an ageing teaching workforce, Germany faces challenges in training and attracting enough teachers.
- Young people from disadvantaged and/or migrant backgrounds continue to lag behind in educational attainment, potentially aggravated during the COVID-19 crisis.

3. A focus on digital education

Digital equipment and connectivity of German schools lag behind the EU average. This is particularly the case at primary level, where in 2017/2018 only 9% of pupils attended highly digitally equipped and connected schools, 26 pps behind the EU average (European Commission, 2019d); for upper secondary the figure is 48%, 24 pps behind. Three quarters of German students have access to digital learning resources (64% offline and 73% online), but 9% have no access to school internet, 50% to official education networks and 70% to school email accounts, all below International Computer and Information Literacy Study (ICILS) averages. Most teachers (90%) use notebooks in class, two thirds their private devices (Bitkom, 2015). The share of digitally supportive schools is low: at primary, lower secondary and upper secondary level, only 5%, 28% and 23% report a strong information and communications technology (ICT) policy and strong ICT support, compared to the respective EU averages of 20%, 33% and 51%.

Students have above-average ICT skills; ICT teacher education and continuing professional development (CPD) is not frequent. The share of students achieving at least basic computational thinking (CT)[106] knowledge (level 2) in ICILS 2018 is, at 67%, 17 pps lower than e.g. Denmark and has stagnated since 2013 (Fraillon et al., 2018). There are differences in knowledge linked to students' socio-economic and migrant background, in particular for those whose home language is not German. Older students' self-perception is positive, with two thirds of 16-19 year-old German students assessing themselves as having above overall basic digital skills (65%, 8 pps above the EU-27 average) and 13% as having below overall basic skills (2 pps below the EU-27 average)[107]. In addition, the share of underperforming students in ICT is comparatively small. Data suggest that German teachers lag behind in ICT skills and in using ICT during lessons (only 20% report use ICT in daily teaching) but are comfortable using it to prepare lessons[108]. As reasons poor equipment, lack of learning materials, low incentives to use ICT and a lack of training are mentioned. In international comparison they receive little CPD on ICT. 89% believe that digital means can allow them to communicate better and are motivated to use them to enrich their teaching, but they lack the necessary equipment (Bitkom, 2015). The Bertelsmann Foundation showed that current teacher training does not guarantee minimum digital skills or a conceptual knowledge of digitalisation (Bertelsmann, 2018)[109]. Reforming initial ICT teacher training as agreed by a working group of the Conference of Regional Education Ministers (KMK) and the Rectors' Conference in 2019 has not yet been implemented.

[106] CT is defined as an individual's ability to recognise aspects of real-world problems which are appropriate for computational formulation and to evaluate and develop algorithmic solutions to those problems so that the solution could be operationalised with a computer.

[107] Eurostat: [isoc_sk_dskl_i].

[108] ICILS T6.1/6.2. Only 23% use ICT every day v 72% in Denmark and 48% on average, but 70% prepare lessons (5 pps below average and 9 pps below Denmark).

[109] For instance, only 5 of 16 regions had included digital media in their exam framework for teacher education.

German federal and regional levels set digital strategies jointly. In 2016, regional Ministers of Education agreed on a detailed framework for digitalisation ('Education push for the digital knowledge society') and the federal government concluded the Digital Pact with them. Signed only in March 2019, it offers a federal contribution of EUR 5 billion over 5 years to equip schools with hardware. Regions promised to invest an additional EUR 550 million over these 5 years in learning materials, curriculum reform and teacher training and to support learning at home (Federal Ministry for Economy and Energy, 2020). Implementation of the Digital Pact has been slow due to lacking local capacity. The Bertelsmann Foundation calculated in 2017 that real investment needs are potentially up to three times the funding committed under the Pact (Bertelsmann, 2017). Monitoring and evaluation of digital initiatives has so far mostly taken place on an ad hoc basis (European Commission, 2019c).

Schools shifted to distance learning during the COVID-19 crisis, but with some weaknesses. Schools were closed from mid-March and started to partially reopen at the end of April. Schools successfully moved to distance learning. The majority of students could cope well, but half considered it difficult and about 10% lost all contact with their teachers and peers. Nearly all missed their friends and school life. Teachers found the transition difficult initially: only a third of schools were well prepared (Vodafone, 2020b). All regions created or strengthened platforms facilitating access to teaching and learning tools and for communication, yet only 35% of teachers managed to have very regular contact with all their students and about 10% had very little or none, which meant an important loss also in social contact. Parental support was crucial during home schooling, but 43% of parents reported having not enough time (Vodafone, 2020a). A big concern is that distance learning might have increased already existing inequalities: regions are implementing a variety of measures, including summer camps, to prevent this from happening. A EUR 500 million 2-year emergency programme agreed on 15 May will allow regions to acquire mobile devices to be lent to students who need one. The government and regions agreed to speed up implementation of the Digital Pact, and to allow its funds to be used during 2020 also for learning and teaching material (EUR 100 million) alongside hardware. Teacher associations in early childhood education and care (ECEC) and in schools have proposed concepts for the use of blended learning in schools. All exit exams have been conducted as normal, allowing access to continued education.

4. Investing in education and training

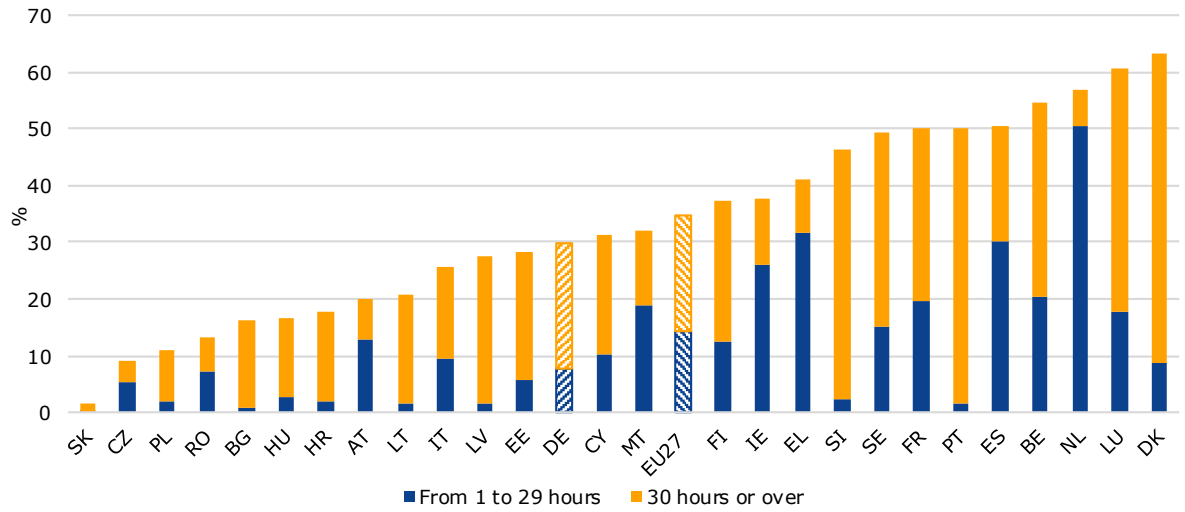
General government expenditure on education as a proportion of GDP remained stable. It was 4.2% in 2018, below the EU average of 4.6%. The share of government expenditure on education in 2018 was 9.4%, slightly down from 2015 (-0.1 p.p.) and 0.5 p.p. below the EU average. Real education expenditure increased between 2017 and 2018 by 2.6%, most notably in pre-primary and primary education. However, over the longer 2010-2018 period, real education expenditure increased by 7.9%, but decreased most significantly in gross capital formation (-20%) and intermediate consumption (-2%), spending categories of importance for digital education. Germany spent a lower than average share of expenditure on employee compensation (58% v EU-27 65%) in 2018. The 2020 European Semester country-specific recommendation (CSR) invites Germany to 'focus investment on education'.

The government announced various spending initiatives in the national reform programme 2020. The federal and regional levels have invested in programmes to improve the quality of education and to address issues identified in the CSRs. In 2017-2020, EUR 1 126 billion were invested in the expansion of ECEC. In 2020, a special investment fund of EUR 2 billion was established to help primary schools prepare better for all-day schooling until 2025. Municipalities received financial support in 2015-2020 of around EUR 175 million for infrastructure (particularly ECEC and greening of school buildings) and an additional EUR 3.5 billion in 2017-2022 to renovate school buildings. The perceived investment back log for education infrastructure at municipal level is estimated to be still over EUR 40 billion however (KfW, 2019).

5. Modernising early childhood and school education

While participation in ECEC for older children is high, it has barely progressed for under 3 year-olds. The participation rate in early childhood education (ECE) is 96.0% for children between 4 and the start of compulsory primary education in 2018 (EU-27 94.8%). Regional values vary by a comparatively small 5.9 pps. However, only 29.8% of children under 3 (EU SILC) were in formal childcare in 2018, a share that rose steadily until 2016, from 19% in 2009 to 31.7% in 2016, before dropping back. Children without a migrant background attended twice as often in this age group (40%) (Autorengruppe, 2018). Participation by children under 3 at risk of social exclusion is particularly low (European Commission 2019f). Overall, the number of children keeps increasing: there were 17% more children under 3 between 2013 and 2018. The German Education Report identifies a need for more than 370 000 additional ECEC places for under-threes by 2025, and an additional 225 000 in all age groups by 2030. At more than one third of ECEC centres, more than 11% of children speak another language at home (OECD 2019b).

Figure 3 - Participation in formal childcare of children below 3 years of age, 2018



Source: Eurostat, EU-SILC survey, [ilc_caindformal].

ECEC provision varies between regions. Regional authorities are responsible for setting minimum requirements, such as space, staff qualifications and child staff ratios: there are no national standards, evaluation or monitoring requirements. About two thirds of ECEC facilities are run by non-state providers[110]. This leads to divergences in attendance, provision and quality. Since 2008 the federal level has helped fund the expansion of ECEC[111]. The 2015 10-point 'Communiqué' between regions and the federal level focused cooperation particularly on quality improvement, leading to a federal law providing for this (*Gute-KiTa-Gesetz* in force since 1 January 2019). This provides federal funding of EUR 5.5 billion for 10 priorities and in particular to reduce or abolish participation costs. In their initial choices, regions prefer measures to improve access over quality improvement measures (Deutscher Bildungsserver, 2020b).

A high share[112] of ECEC staff is trained but to varying levels of qualification, and CPD is not compulsory. According to TALIS Starting Strong, 65% of ECEC teachers report having a vocationally oriented bachelor's degree, while 4% have an academic bachelor's degree (OECD, 2019b). The qualifications of ECEC assistants vary widely between regions, ranging from courses of 30 to 300 hours (European Commission 2019e). A bachelor's degree is required to manage an

110 In 2017 69% of under-3s and 65% of 3-5-year-olds. Eurydice, TALIS Strong 71%.

111 Childcare Funding Act 2008.

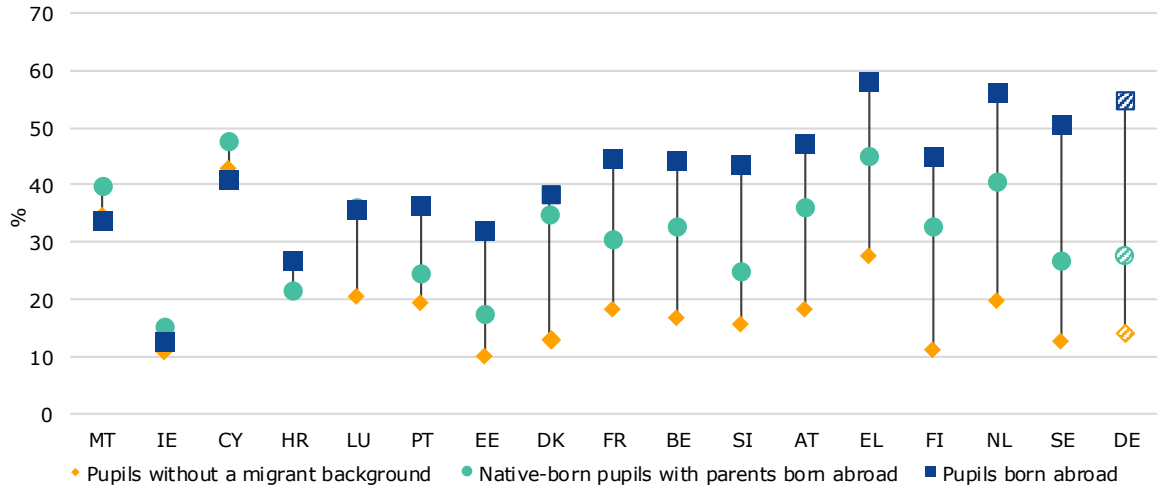
112 89% of pedagogical staff in Autorengruppe 2018.

ECEC institution but only 35% of managers have received pedagogical leadership training. 93% of ECEC staff are satisfied with their job; 61% consider that there are too many children in a group; 26% are satisfied with their salary and only one third (36%) feel valued by society (OECD 2019b). CPD is not compulsory; nevertheless, 82% have participated in the past 12 months. The ongoing increase in ECEC provision, combined with the limited attractiveness of the profession, is already causing regional staff shortages that are expected to increase to 200 000 by 2030 (OECD, 2020). The 'Skilled Labour Initiative' (2019–2022) aims to attract new talent and retain ECEC professionals.

Performance on basic skills is above the EU average but has weakened somewhat over the years. Overall performance is above the EU average, particularly in science (OECD, 2019 Vol. I). Germany has persistently more top achievers than the EU average in 2018 in science (10%, +3.7 pps), reading (11.3%, +2.8 pps) and mathematics (13.3%, +2.3 pps). The share of low achievers remained below the EU average in 2018 in all three tested areas, between -1.8 and -2.7 pps.

Socio-economic and migrant backgrounds have a strong impact on education outcomes and disadvantaged pupils are more concentrated in certain schools. Advantaged students outperform their disadvantaged peers by 113 score points (EU 95 points), which corresponds to almost 3 years of schooling. The gap has increased by 20 score points since 2015. Moreover, the OECD Programme for International Student Assessment (PISA) 2018 shows that pupils from a disadvantaged background tend to be concentrated in the same schools and are less likely to be exposed to high-achieving students[113]. The impact of socio-economic status on reading performance is also above the EU average at 17.2% (EU-27 14.2%). Pupils from a low socio-economic backgrounds have one of the lowest rates of expectation of completing tertiary education (13.9%; EU 43.4%). The share of students with a migrant background has increased to 22.2%, with 15.7% native born with a migrant background and 6.6% foreign born. In reading, foreign-born pupils trail behind native-born by 114 score points and second-generation migrant pupils by 42 points. Comparing results to 2009, the second generation saw some improvement (+20 points) but the first generation did much worse (-46 points), diverging from the slightly positive EU trend (+7.7 points). 54.7% of foreign-born students are low achievers in reading, one of the highest shares in the EU; for the second generation, this falls to 27.7% and for native born to 14.3%.

Figure 4 - Underachievers in reading by migrant background, PISA 2018



Source: OECD (2019), PISA 2018. Note: EU Member States with a share of migrant pupils lower than 5% are not shown in the chart.

[113] PISA isolation index: DE (0.72) compared to the EU average (0.68). The isolation index is derived from the exposure index, and ranges from 0 to 1. The lowest value (0) is observed when the two subgroups are clustered in the same schools; the highest value (1) is observed when they are clustered in different schools.

Well-being is important in German schools. Three quarters of German pupils report that they belong to their school (EU-27 65%) and only 15.9% that they feel like an outsider. This high level of self-reported well-being has remained stable since 2015. About 22.7% of 15 year-olds report being bullied at least few times a month (EU-27 22.1%). Bullying has a greater impact on reading performance in disadvantaged schools than in advantaged schools[114].

The early school leaving (ESL) rate remains stable since 2015, just above the EU target, with an increasing gender gap. It is 10.3% in 2019, close to Germany's national target of 10%. The gender gap has increased continually since 2015, from 0.6 p.p. to 3.5 pps in 2019, twice the EU average. Foreign-born pupils are three times more likely to be early school leavers (24.2%) than native born (8.1%). ESL rates vary regionally between 6.9% in Swabia and 16% in Bremen. In 2010-2019, rates fell by 2.4 pps in cities, but remained practically unchanged in rural areas and towns (both -0.2 p.p.).

Germany has an ageing teaching workforce and will face increasing teacher shortages. In 2019, the Bertelsmann Stiftung revised its estimates for the expected increase in the number of students in primary education in 2025 by up to 170 000 (Bertelsmann 2019). This translates into at least 26 000 additional required teachers by 2025 and a further 3 900 by 2030. The KMK has also updated its projections, confirming the challenge for the regions to recruit and train sufficient teachers. In addition to higher numbers of children of school age, the extension of all-day schools – to which each student will have a right from 2025 – will drive demand. The German Education Report 2018 identifies the risk of particular shortages in natural sciences[115]. The numbers participating in the '*Quereinsteiger*' initiative to retrain as a teacher has tripled over the past 10 years. The German Youth Institute (Deutsches Jugendinstitut 2019) estimates the cost of the initiative to be higher than provided for, namely EUR 7.5 billion for investment plus EUR 4.5 billion annually.

Despite comparatively high salaries, the teaching profession remains unattractive. Primary school teachers earn 91% and lower secondary teachers 100% of the average earnings of full-time tertiary educated workers, while upper secondary teachers earn 106% on average. While the starting salary is comparatively high, there is only moderate career progression (21% after 15 years, substantially below the EU average of 40%)[116]. Teaching career prospects have improved due to teacher shortages, leading to higher salaries and the re-introduction of civil servant status, particularly in the eastern regions. However, the perception of an unattractive profession and the increasingly complex teaching environment have made it difficult to fill vacancies. Several regions have campaigns to encourage young people to choose a career in teaching, notably North Rhine Westphalia (NRW, 2018) and Baden-Württemberg.

6. Modernising vocational education and training

Although the number of VET learners rose by 0.9%, the number of new apprenticeship contracts dropped by 1.2% in 2019. In terms of supply and demand, bottlenecks remain for apprenticeships, notably due to occupational imbalances (late September 2019: 53 100 vacancies and 24 500 applicants without apprenticeships[117]).

Several new pieces of legislation came into force in 2020. In January 2020, a new law was adopted to align dual VET with future requirements in five areas, by introducing a minimum training wage for apprentices, emphasising equivalence to academic qualifications by introducing new terms for advanced vocational training programmes[118], expanding part-time vocational training to new target groups such as people with learning disabilities or people needing to work

[114] The difference amounts to –69 score points. 12 EU countries perform better and 14 worse, the OECD average is -48.

[115] The share of over-60s increased in 10 years from 8% to 14% in 2016.

[116] OECD at a Glance 2019 compares USD figures on PPP basis and contains an EU average of the 23 participating countries.

[117] BMBF Berufsbildungsbericht 2020.

[118] Examples include: Certified Professional Specialist (EQF level 5), 'Bachelor professional' (EQF level 6) and 'Master professional' (EQF level 7).

alongside their training, facilitating recognition of prior VET learning and reducing administrative burdens[119]. A Law to reform the care and nursing occupations) came into force in early 2020 with measures to increase quality and attractiveness of occupations in the sector. As part of the 'skilled workers strategy', the Skilled Immigration Act came into force in March 2020 granting applicants with a recognised full vocational or higher general education qualification the possibility to live and work in Germany. The new version of the law on advanced training programmes to become a master craftsman or technician, aiming to increase outreach, was approved[120].

Box 1: Qualification of skilled workers in the future digitalised world of work (FachWerk)

This project (EUR 1.3 million) is co-financed (45%) by the European Social Fund and aims to establish multimedia teaching and learning arrangements for the use of ICT technologies in skilled trades, including construction. Project duration was February 2017-March 2020. Digitalisation in VET is still not very widespread. The developed method allows individualised upskilling in the form of blended learning. A variety of local partners should ensure the sustainability of this initiative.

https://www.produktion-dienstleistung-arbeit.de/de/projekte.php

Several measures were taken in response to the COVID-19 pandemic. In April 2020, the Federal Cabinet adopted the Law on the promotion of continuing vocational training during times of structural changes and further development of funding of vocational training assistance[121]. It also further developed labour market support instruments, including facilitating access to short-time work benefits and employee qualification. The Federal Education Ministry published a new funding guideline for 'Innovation Competition INVITE (Digital Platform for Continuing Education and Training)', which aims to develop concrete innovations for continuing vocational training, particularly in relation to digitally driven systems for information, advice and guidance[122].

7. Modernising higher education

At 35.5% in 2019, the tertiary education attainment rate is increasing slowly, by 6.1 pps since 2009. Germany is the only EU country with practically no gender gap (0.8 p.p.). Tertiary attainment varies widely between regions, from 51.3% in Berlin to 21.1% in Brandenburg. The number of new entrants to higher education at bachelor level is broadly unchanged since 2015. The participation of students from disadvantaged backgrounds remained stable at around 30% for over a decade (Autorengruppe, 2018). In contrast did foreign-born students increase their participation in ten years by over 10 pps to 34.2% in 2019, very close to the average and a much lower gap than throughout the EU. At 35%, Germany continues to have the highest proportion of science, technology, engineering and mathematics (STEM) graduates in the EU: 40.1% at bachelor, 30.1% at master and 47.3% at PhD level. The share of female graduates in STEM subjects amounts to 28% compared to 51% in all subjects, with a STEM gender gap around the EU average[123]. The number of annual new STEM entrants decreased slightly in 2013-2018, particularly in engineering, but increased in ICT[124]. Recent tertiary graduates integrate very well into the labour market

119 Cedefop VET report Germany 2020.

120 BMBF (2020): Weiterkommen mit dem Aufstiegs-BAföG. https://www.bmbf.de/de/weiterkommen-mit-dem-aufstiegs-bafoeg-879.html.

121 Deutscher Bundesrat (2020): Gesetz zur Förderung der beruflichen Weiterbildung im Strukturwandel und zur Weiterentwicklung der Ausbildungsförderung. Drucksache 197/20. https://www.bundesrat.de/SharedDocs/beratungsvorgaenge/2020/0101-0200/0197-20.html

122 Report on national developments in adult learning for Germany, 2020.

123 Eurostat, [educ_uoe_grad02].

124 Eurostat, [educ_uoe_ent02].

(94.7% in 2019), marginally higher than recent VET graduates (ISCED 3-4) at 93.4%[125], both well above the EU average employment rates.

Box 2: Germany is well integrated into international education, with a high share of outgoing and incoming students

In 2018, 19.9% of tertiary graduates either obtained their degree abroad or spent a short time abroad during their studies. Most mobility is at master level (25.3%). The highest share of full degree mobility is for short-cycle tertiary education, followed by doctorate education (10.7%). Regarding inward degree mobility, Germany attracts students from abroad, particularly at doctorate (21.0%) and master levels (14.6%). While a high proportion of foreign graduates come from the EU (25.6%) and non-EU European countries (13.7%), a significant share comes from Asia (37.0%) and, to a lesser extent, Africa (6.7%) and the Americas[126].

Student numbers have increased faster than funding in higher education, causing regional disparities. Student numbers keep increasing[127], by +37% over 10 years. Student teacher ratios vary considerably by region: Mecklenburg Vorpommern has 9 students per fulltime teacher equivalent,, and North Rhine-Westphalia and Bremen 18. While public expenditure has increased by 35.9% in nominal terms over the last decade, an investment gap remains. Two important funding instruments were signed between the regions and the federal level in 2019 (*'Future contract for strengthening study and training', 'Agreement on innovation in higher education teaching')* (Federal Ministry for Economy and Energy, 2020). Opportunities for part-time study are generally lacking, making it difficult to combine studying with work, and also representing an impediment to upskilling[128]. Even though the Federal Constitutional Court has declared the system unconstitutional and accepts only differentiation according to the 'suitability' of students, 40% of study courses still have managed admission.

Higher education institutions dealt successfully with COVID-19. The higher education vacation period in Germany is usually from mid-February to mid-April. This limited the immediate COVID-19 impact and gave German universities nearly a month to prepare. The *Hochschulforum Digitalisierung*, a think tank platform, played an important role[129]; 90% of participating institutions considered themselves well prepared in a survey conducted in early April[130]. Higher education during the summer semester was digital, ensuring access for foreign students who may lack full credentials.

8. Promoting adult learning

In 2019, Germany launched some promising reforms to improve upskilling and reskilling, yet there is potential to do more. Participation in adult learning, at 8.2%, is below the EU average of 10.8%. In addition, on average only 4.1% of the low-skilled participated in training (in the 4 weeks before being surveyed), just short of the EU average of 4.3%[131]. Recent reform initiatives include the 'Qualifications Opportunities Act' (*Qualifizierungschancengesetz*), which improves access to and financial support for further education of employees whose jobs are at risk of being replaced by new technologies. The national skills strategy (*Nationale Weiterbildungsstrategie*), adopted in 2019, combines federal with regional programmes. It is

125 Eurostat, Labour Force Survey, [edat_lfse_24].

126 Calculations by DG EAC, based on UOE data.

127 2 897 300 students are enrolled in the winter semester 2019/2020.

128 The share of part-time students amounts to 7.1%. It has slightly decreased since 2000. It is much higher in some regions, e.g. 20.7% in Hamburg and 14% in North Rhine-Westphalia (Expert, 2020).

129 https://hochschulforumdigitalisierung.de/

130 https://www.stifterverband.org/hochschul-barometer.

131 Eurostat, 2019.

expected to improve transparency and accessibility, better recognise informal skills and guide the low-skilled to formal qualifications, including through partial qualifications[132].

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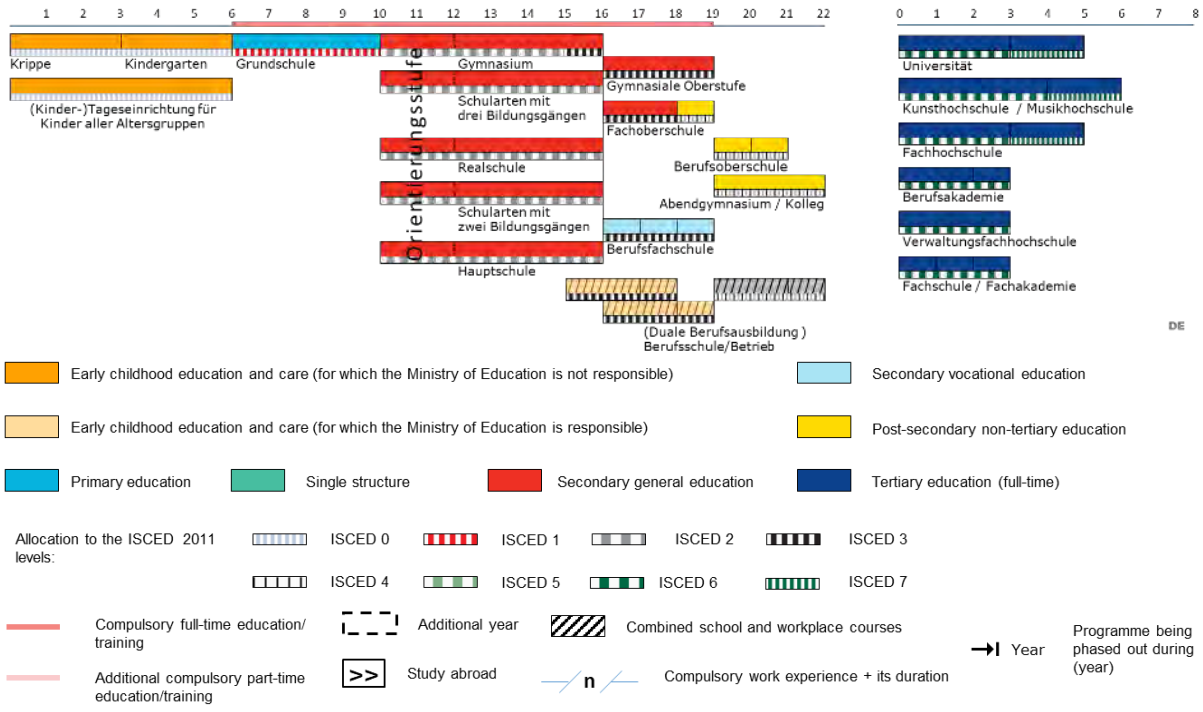
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Klaus KOERNER
Klaus.KOERNER@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

GREECE

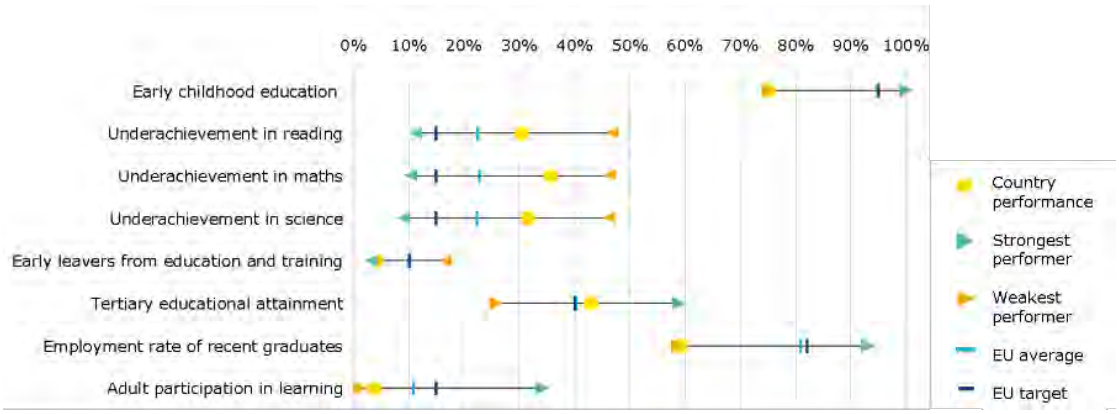
1. Key indicators

Figure 12 – Key indicators overview

			Greece		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			14.2%	4.1%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			26.6%	43.1%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			74.1%	75.2% b, 18	90.3%	94.8% 18
Proportion of 15 year-olds underachieving in:	Reading		21.3%	30.5% 18	19.3%	22.5% 18
	Maths		30.4%	35.8% 18	22.2%	22.9% 18
	Science		25.3%	31.7% 18	17.8%	22.3% 18
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		65.2%	59.4%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		3.5%	3.9%	7.9%	10.8% b
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	12.2% 18	:	4.3% 18
	Credit mobile graduates (ISCED 5-8)		:	: 18	:	9.1% 18
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		4.1%	3.9% 18	5.1%	4.6% 18
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€4 204 12	€4 465 17	€6 072 d, 12	€6 240 d, 16
		ISCED 3-4	: 12	: 17	: 12	€7 757 d, 16
		ISCED 5-8	€2 640 12	€2 294 17	€9 679 d, 12	€9 977 d, 16
Early leavers from education and training (age 18-24)	Native-born		9.6%	2.9%	12.6%	8.9%
	Foreign-born		43.8%	26.9%	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		29.7%	47.0%	32.0%	41.3%
	Foreign-born		10.3%	16.1%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		60.8%	51.0%	72.2%	75.9%
	ISCED 5-8		68.1%	64.2%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs; u = low reliability; : = not available; 12 = 2012, 16 = 2016, 17 = 2017, 18 = 2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Digital education has become a policy focus in Greece. During the COVID-19 lockdown the country took decisive steps to move learning online, but also faced challenges with access and implementation.
- Reading, maths and science performance has declined and socio-economic background considerably affects achievement levels.
- Higher education has started to be modernised, with reforms to funding, quality assurance and internationalisation.
- Raising the attractiveness of and participation in vocational education and training and adult learning remains a key challenge.

3. A focus on digital education

Greece has made considerable efforts to upgrade its digital infrastructure but still lags behind other EU countries. Equipping schools with information and communication technology (ICT) infrastructure has been largely funded through European Structural and Investment Funds (ESIF). 'Traditional' equipment like desktops are most common, often concentrated in ICT labs. This is due to factors such as ICT being a separate subject at primary and secondary level, and university ICT equipment being handed down to schools. The OECD Programme for International Student Assessment (PISA) 2018 showed that only one third of students attend schools with sufficient digital devices (Reimers and Schleicher, 2020). ICT technical support does not necessarily respond to schools' specific needs as it is external and scarce. Only 14% of pupils attend schools with sufficient qualified technical assistant staff – the smallest proportion in the EU (ibid.).

The switch to remote teaching during COVID-19 highlighted the risk of exclusion for disadvantaged students. In 2018, one fifth of students did not have access to a computer for school work (Reimers and Schleicher, 2020). According to survey data, during the pandemic Greek households had the most difficulties in the EU to make ends meet (Eurofound, 2020), putting vulnerable groups, including children, even more at risk of exclusion. Emergency legislation passed in April 2020 enabled municipalities to use money saved on operational costs during school closures to procure ICT equipment for students in need. For higher education institutions (HEIs) procedures were simplified until mid-June 2020 to buy servers, software licenses and equipment. Private donors provided over 20 000 tablets and laptops. After lending them to students (mostly from disadvantaged groups) and teachers for distance learning purposes, all devices will become part of schools' ICT equipment. Access to the digital education platforms of Ministry of Education and Religious Affairs was available to all students free of (internet) charge during the lockdown.

Digital learning during closures of education institutions presented challenges and opportunities. The Ministry of Education and Religious Affairs issued detailed instructions for asynchronous teaching (content on platforms, emails) and synchronous (real-time) teaching. Schools were granted more autonomy since they could choose the distance learning curriculum. However, teachers applied distance learning unevenly, which created imbalances between and within schools. The Ministry collected comprehensive data on the number of sessions, participation level and even the number of minutes spent on distance learning. To draw lessons, qualitative aspects deducted from surveys could provide further insights, such as: (i) participation per education level; (ii) students' socio-economic background; (iii) challenges encountered; and (iv) reasons for not participating in distance learning. Universities were offered extra technological platforms to complement existing infrastructure. At the end of the semester, 96% of the courses had been offered online.

Comparatively few students report above average digital skills despite significant commitment to digital education. A considerable amount of digital educational content has been developed in recent years. Greece has among the highest number of recommended hours annually (150) for ICT as a compulsory separate subject in primary education, and digital learning

outcomes are specified in detail for all education levels (European Commission, 2019b). A lack of monitoring at system level, however, makes the impact of in-school digital education outcomes difficult to ascertain. Only 5% of individuals aged 16-19 reported to have low digital skills in 2019 (EU-27: 15%)[133]. However, at 32%, the share of those with above basic overall digital skills was well below the EU-27 average of 57%. Legislation passed in June 2020 provides for further familiarisation with digital content in kindergarten on a pilot basis and reinforces digital education at secondary level.

Teachers are key enablers of ICT in education. Well-prepared, effective teachers are essential for digital education (Brown et al., 2019; Comi, 2016). European Social Fund (ESF)-supported training has provided a large proportion of Greek teachers with fundamental digital knowledge (see Box 1). The fast changing ICT technology requires that training be regularly renewed. It should also be adapted to the needs of individual schools and teachers, given the higher effectiveness of school-based and individualised teacher training (OECD, 2019e). Besides training, framework conditions, including sufficient time in the curriculum and available support for teachers, can help integrate ICT in education and advance students' digital skills and overall educational performance (Comi, 2016). In Greece, the content-centred curriculum and teaching practices leave so far little room for teachers to meaningfully integrate ICT in education (Papadakis et al., 2012), while weak ICT support in schools may keep digitally trained teachers from applying their skills.

Box 1: EU support for teacher training on digital technologies

In the 2014-2020 ESF programming period, Greece carried out the programme 'In-service training of teachers in the utilisation and application of digital technologies in teaching practice'. The regularly updated training content covers primary and secondary education teachers of all subjects. Two levels - introductory and advanced - provide comprehensive training on ICT in the classroom. An exam at the end of each level leads to a certification.

The programme started in 2016 and will run until the end of 2020. So far, 2 870 classes have been provided for almost 36 000 teachers and around 300 trainers.

Budget: EUR 13.4 million (ESF contribution EUR 10.4 million)

https://e-pimorfosi.cti.gr

Under the European Commission's structural reform support programme Greece also implements a project to improve digital education. The project examines schools' digital readiness and will give recommendations for good use of ICT in schools. It will develop two massive open online courses (MOOCs) for teachers on the pedagogical use of ICT in the classroom.

4. Investing in education and training

Education remains underfunded, in particular at tertiary level. In 2018, Greece dedicated 3.9% of its GDP to education, one of the lowest shares in the EU (EU-27 average: 4.6%). The education budget reached EUR 8 051.8 million - a 2.9% increase compared to the previous year (in real value) but below the spending level of 2015. Only 8.3% of total government expenditure went to education in 2018 (EU-27: 9.9%). Compared with 2017, spending on tertiary education increased by 10.9%, albeit from a low level. In 2017, public spending per tertiary student was very low at EUR 1 790.4 (in PPS)[134], even when taking into account Greece's high rate of 'eternal', i.e. only nominal students[135].

133 Eurostat data.

134 The lowest of all recorded EU Member States. Latvia had at EUR 3 823.2 the second lowest value.

135 Greece has the highest enrolment rates in the 30-39 age bracket in the EU (Eurostat 2018 data).

5. Modernising early childhood and school education

Participation in early childhood education is low but has improved for the youngest. 75.2% of children aged 4-6 attended early childhood education (ECE) in 2018, below the EU-27 average (94.8%) and far from the ET2020 benchmark of 95%. The low rate might be partly explained by incomplete data.[136] For children under 3, participation increased to 40.9% in 2018 (EU-27: 34.7%), up from 20.5% in 2017. The increase is mainly due to many more children (+19.8 pps) attending childcare facilities for 1-29 hours, whereas participation for 30 hours and above rose only slightly (+0.6pps). The roll-out of compulsory education to 4 year-olds until 2022 is expected to increase the ECE participation rate.

Unmet needs for early childhood education and care (ECEC) are significant. Persisting challenges in data collection and the absence of a collective register for municipal facilities (Nikolaidis, 2019) complicate demand/supply estimates. Nevertheless, the regional participation distribution indicates a shortage of places: participation is much higher on islands (up to 86%) and in remote areas than in the most populous and economically more prosperous region of Attica (67.1%)[137]. Inadequate infrastructure, including old and inappropriate buildings, remains a major obstacle. Private ECEC provision is inaccessible to many Greek parents, instead they resort to informal care. 36.9% did so in 2018[138] – the highest share in the EU. Affordability is a key barrier for 13.7% of parents of children aged under 3, resulting in unmet childcare needs (Chzhen et al., 2019). Access to high-quality ECEC is not only important for individual educational outcomes but has broader societal and economic benefits (EENEE, 2018).

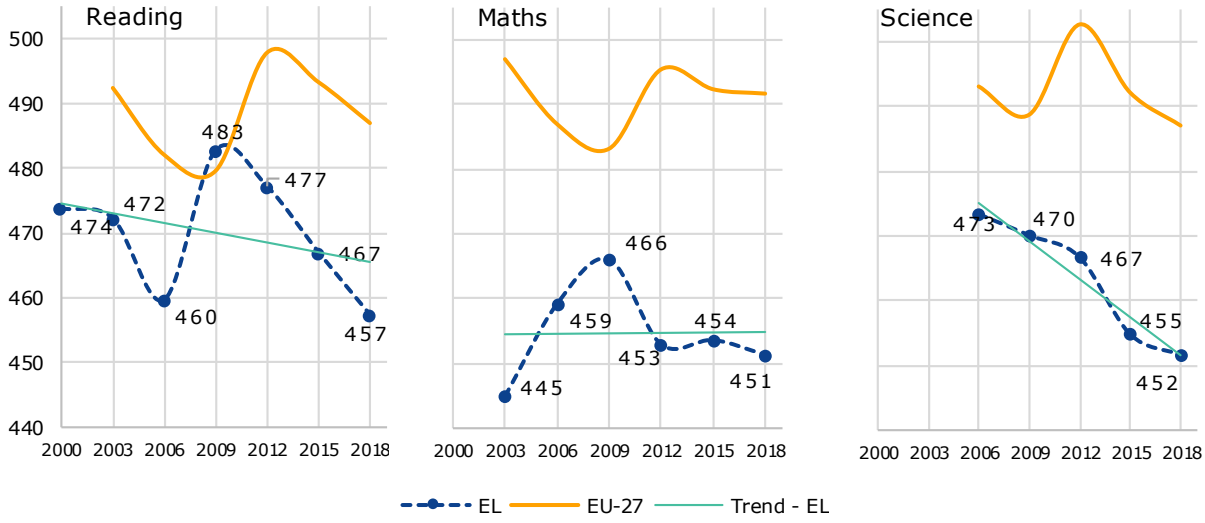
Underachievement in basic skills remains high. PISA 2018 showed a broadly stable (though comparatively low) performance of 15 year-olds in Greece in reading, maths and sciences compared to 2015. Performance in maths and reading has gradually declined since 2009, and in science since 2000. In each subject, one third of students are underachievers – among the highest shares in the EU. Whereas the shares of low achievers have increased over time, those of top achievers have declined. The persistently low results demonstrate the limited success of education measures over the past 10-15 years. New legislation emphasises skills development, including critical thinking. However, contrary to most EU countries (European Commission, 2019c), national testing has not yet emerged as a policy instrument apart from national university entrance exams. In the absence of national student performance data, PISA can provide valuable insights for necessary reforms to improve student outcomes.

136 The value does not include those 4 year-olds enrolled International Standard Classification of Education 01.

137 Data refers to ECE, not childcare.

138 Eurostat data. The share refers to 30 hours and over, i.e. excluding supplemental care, and refers to care by grandparents, other household members, other relatives, friends or neighbours. Professional childminders do not exist in Greece.

Figure 3 - Trends in performance, PISA mean score 2000-2018



Source: OECD (2019), PISA 2018 Database.

Despite the largely centralised and uniform education provision, PISA reveals considerable disparities across the Greek education system. Girls outperform boys in all three areas. In reading - the PISA 2018 focus area, the gap translates to 42 score points or more than 1 year of schooling. There is an even higher gap - of 116 points, corresponding to around 3 years of schooling - in reading performances of students in vocational[139] and general programmes. Rural schools lag behind urban schools by 63 points, equivalent to 1-2 years of schooling. The performance gap between schools with a high concentration of students with a migrant background and those without is larger than in most EU countries.

Students' socio-economic background plays a significant role in their performance. Among students from the lowest socio-economic quartile, 46.4% are underachievers in reading compared to 15.2% from the highest quartile – a gap above the EU-27 average (26.9 pps). Among students with a migrant background, 48.3% are low achievers compared to 27.4% among those without a migrant background. However, the likelihood of children from a migrant background becoming low achievers is much lower after accounting for gender and socio-economic profile, which implies that remedial measures should take this into account.

Students' well-being influences their performance. In Greece, a much lower share of pupils (19.3%) than in most EU countries feel they do not belong to school. There is, however, a higher prevalence of bullying. One in 3 boys reports being bullied at least a few times a month compared to 1 in 5 girls. More low achievers (39.3%) than high achievers (19.9%) are frequently bullied. The percentage of students skipping whole days or classes at schools is comparatively high. These findings underline the need for a policy focus on students' well-being. New legislation introduced the role of teacher mediator, who is trained to manage violent situations. Schools can also draw up specific internal rules and introduce disciplinary measures including temporary school suspension.

Changes to teacher recruitment were introduced but bottlenecks persist. Greece struggles every year to fill vacant teacher posts until long after school has started. The hiring delays suggest structural inefficiencies and have negative impacts on education provision. Until March 2020, more than 25 000 substitute teachers had been hired, adding to the over 20 000 already in the system. Overall, almost half of teachers are aged over 50 and set to retire within the next decade. The necessary renewal of the teaching workforce is also an opportunity to modernise the teaching profession including by establishing frameworks on career development and competences (European Commission, 2020c). Graduates of private higher education institutions can now apply

[139] About 13.5% of student population.

for teacher posts, which have the status of public official in Greece. This decision was strongly criticised by stakeholders who consider it a drawback for the teaching profession, since access to private colleges is not based on national exams.

New school legislation emphasises skills development and strengthens quality assurance. Legislation passed in June provides for curricula and textbook revisions across all levels (including ECE) aiming at skills development structured around four thematic pillars: environment, well-being, creativity and citizenship education. Digital education and language learning (English) is introduced in pre-primary education on a pilot basis and reinforced throughout. The new law also proposes a coherent framework for internal and external school assessment. In 2017, legislation on school self-evaluation was voted, but implementation has so far been patchy. The government's aim is to modernise the Greek education system and prepare students for a complex, rapidly changing reality. At the same time, the amount and pace of reforms in recent years has led to resistance among teachers, who have to juggle partially contradictory expectations for high academic achievement, innovative pedagogy and flexibility (Kotrouba, 2017). Active stakeholder engagement and a common vision for education are therefore crucial to successful reforms (OECD, 2018).

Early school leaving is among the lowest in the EU. In 2019, only 4.1% of 18-24 year-olds had obtained only lower secondary education or less and were not in education or training (EU-27: 10.2%). Greece has steadily reduced early school leaving (ESL) from its overall level of 14.2% in 2009, particularly in rural areas, where the drop was as high as -11.4 pps from 18.7% in 2009. Among foreign-born students, 25.0% had left education or training early in 2019 – an increase of 5.1 pps compared with 2018 and one of the biggest gaps compared to native-born (2.0%) in the EU.

Inclusive education is to be strengthened. The Ministry of Education is cooperating with the European Commission and the European Agency for Special Needs and Inclusive Education to implement recently adopted legislation aiming to empower schools to respond to the diversity of all learners. Work is under way to develop a framework and practical guidelines for schools by drawing on European good practices.

Greece has made substantial efforts to integrate recently arrived migrants into education, but many remain outside the system. In the school year 13 028 recently arrived migrant children were enrolled in education (including ECE). However, of the 10 600 school-aged children (4-17) on the Aegean islands, only about 400 were in school from February 2020. These children attended 16 newly created afternoon refugee education centres (there are 104 centres across Greece catering for about one third of children in education). The rest attend mainstream schools, both with and without reception classes. There are concerns about segregation due to these separate structures, but also about segregation inside schools (Simopoulos, 2019). Policies to integrate refugee students into VET or tertiary education need to be reinforced. The lockdown often interrupted schooling because of a lack of electronic devices and internet access, dire living conditions with whole families sharing one mobile, and/or insufficient language skills to benefit from the Greek learning platform. Practically all 3 863 teachers of recently arrived migrant children are substitute teachers. Despite their personal motivation, it is a concern that many do not have relevant experience or training in refugee education or teaching Greek as a second language (Mogli, 2020). In response, a three-year programme for capacity building has been initiated. TALIS 2018 identified teaching in a multicultural or multilingual setting as a major training need of teachers in EU countries (OECD, 2019d).[140]

[140] Greece did not participate.

6. Modernising vocational education and training

To increase the attractiveness of VET, links to the labour market need to be strengthened. The employment rate for VET graduates remained stable at around 50.9% but is still far below the EU average of 79.1%. High-quality training programmes will be key for a robust post-crisis recovery. The continuous development of the optional fourth apprenticeship year for upper secondary VET graduates with a strong work-based component is expected to strengthen the link between education and the labour market. Four thousand secondary VET teachers have been trained on apprenticeship issues and certification of career guidance counsellors is under way. VET graduates' skills certification will facilitate their integration into the labour market. Thorough monitoring of all VET initiatives and projects will strengthen the sector.

The lack of digital skills impacts employment prospects. The OECD's survey of adult skills (PIACC) reveals that 20.2% of adults surveyed had no prior experience with computers and lacked basic digital skills (OECD, 2016). According to a recent national study, the lack of digital skills prevents people from finding employment. It also poses a job risk for those employees whose work is already or will soon be affected by digitalisation (Lapatsioras et al., 2020). Some trainees completed their classes via distance learning during the lockdown in order to take the final training/apprenticeship examinations after educational institutions reopened. In some organisations, all continuous VET (CVET) courses were postponed except for a small percentage offered through distance learning. Remedial measures after schools' reopening included extending the training period, increasing hours for study and practical work, adjusting exam conditions. The 2020 country-specific recommendation urges Greece to develop a 'very-high capacity digital infrastructure and skills.' (Council of the EU, 2020).

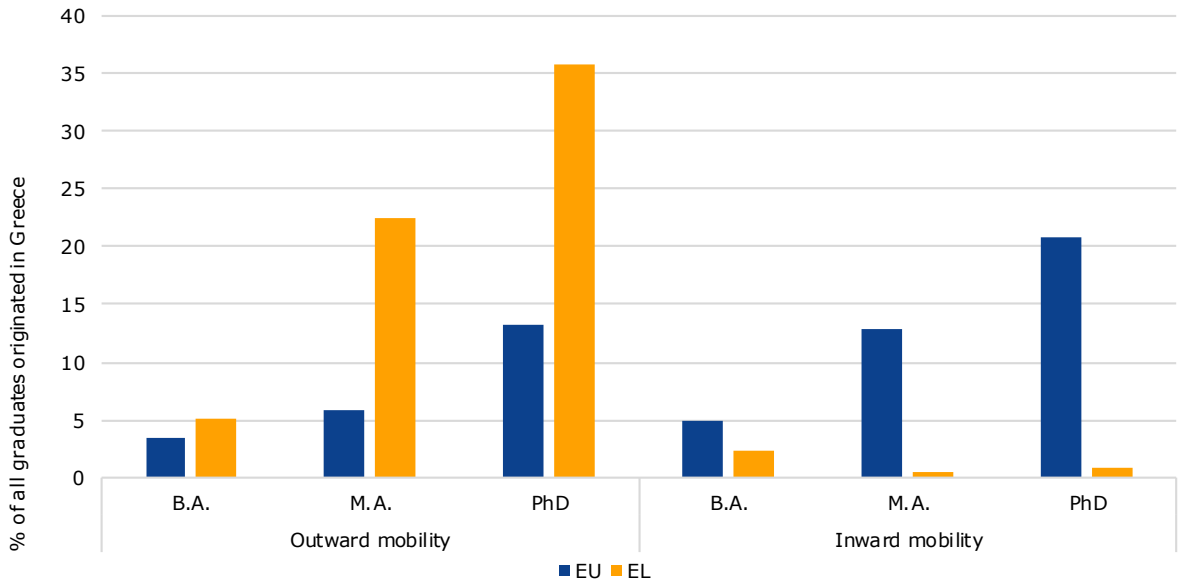
7. Modernising higher education

Employment of tertiary graduates has risen, but their lack of soft skills affects their job prospects. In 2019, 43.1% of adults aged 30-34 had attained tertiary education, above the EU-27 average of 40.3%. However, among foreign-born people, only 16.1% had a tertiary degree, the lowest share in the EU (EU average: 35.3%). The employment rate among recent graduates (20-34 year-olds) was 64.2% in 2019. Though still the lowest rate in the EU (EU average: 85.0%), it has exceeded 2010 levels for the first time. The employment of people with secondary education, on the other hand, trails behind the EU average for both general (51.3%) and vocational (50.9%) profiles. Employers have observed a significant lack of skills related to communication, teamwork, flexibility and adaptability among job candidates in general (Adecco, 2018). Greek students, while apparently less aware of the relevance of soft skills than students in other countries, also feel they lack skills in areas they consider essential for job performance, including communication, teamwork, self-confidence and work ethic (Pereira et al., 2019).

Greek higher education caters mostly to undergraduate studies. Greece has by far the EU's highest share of students enrolled in undergraduate programmes (86% v EU-27 average of 60%[141]). But at master's level the share is only 10% (EU average: 29%). Many students leave the country for post-graduate studies. In 2017, 25.8% of master's graduates obtained their degree abroad (EU average: 5.3%). Inward degree mobility by contrast is one of the lowest in the EU. Through legislation introduced in 2020, universities are now allowed to offer undergraduate programmes in foreign languages, joint degrees and double degrees between Greek and foreign HEIs.

[141] Eurostat 2018 data.

Figure 4 – Share of degree-mobile graduates, 2018



Source: DG EAC computation on UOE data. For details about definitions see Flisi, S. and Sánchez-Barrioluengo, M. (2018). Learning Mobility II. An estimation of the benchmark.

Box 2: How do graduates in Greece get on?

The EUROGRADUATE pilot survey among bachelor's and master's graduates in eight countries[142] confirms that Greek graduates face increased challenges. Many relate to the difficult labour market situation, but some are linked to the quality of education and work environment (European Commission, 2020a). Survey findings include:

Comparing study conditions, it appears that 78% of bachelor's students rely on financial support from their families while only 1% receive a grant. Universities on the other hand provide a work-related learning environment through internships or work placement at bachelor's rather than at master's level. This might be one reason why skills mismatches are less pronounced for bachelor's than for master's graduates.

However, the lack of higher-skilled jobs is the main reason for the pronounced vertical skills mismatch, i.e. people working in positions below their qualification. Education, arts and humanities programmes match available jobs the least (45%), while natural sciences (including mathematics) and health (79.2%) provide the best match. Many students and graduates therefore decide to leave, since they receive around 80% higher hourly earnings outside Greece. Another option is self-employment, including with staff - which 5 years after graduation a much higher proportion of graduates has resorted to than in other countries.

Skills/job misallocation also has a non-economic impact, including on personal happiness, health, trust, and attitudes towards immigration or the EU. Greek graduates report an exceptionally low work-life balance and their perception that their jobs are useful for society is lower than in other EU countries. They also report fewer learning opportunities, poorer career prospects and lower levels of autonomy on the job, which is related to the high share of vertical jobs mismatch.

So far, graduate tracking has been largely lacking in Greece. However, 2020 legislation introduced the legal obligation to track higher education graduates. Setting-up comprehensive graduate tracking is estimated to take 6 years (European Commission, 2020b).

[142] Austria, Czechia, Croatia, Germany, Greece, Lithuania, Malta, Norway.

Prior to initiating major reforms in higher education, previous policy measures were reversed. The process of establishing 38 departments across different universities in Greece, following the merger of technical education institutions with universities (European Commission, 2018), was suspended in 2019. The government also abolished the university asylum (ibid.) and repealed the creation of two-year level 5 European Qualifications Framework (EQF) tertiary (VET) courses at universities as well as access to low-demand departments for first-time students without national exams. As before, all departments receive university entrants by central allocation based on competitive exams.

The Hellenic Authority for Higher Education (HAHE) has replaced the former quality assurance agency. In addition to all external quality assurance for HEIs, the new body will help formulate and implement the national higher education strategy, and help allocate universities' funding. The higher education authority is governed by a Supreme Council consisting of five active or retired professors from Greek or foreign higher education institutions. The president of the Supreme Council, who is appointed by the Greek Parliament, is actively involved in choosing the other council members. Since spring 2020, HAHE has been fully operational.

Greece is introducing performance-based funding and amending degree recognition. According to legislation passed in January 2020, universities' funding will be partly based on performance criteria, including on internationalisation, absorption of graduates in the labour market and the ratio of new entrants to graduates. Universities can select the group of indicators that will determine 20% of their funding. The first funding agreements under the new conditions are expected from 2022 onwards. The same law also ensures recognition of degrees from private foreign colleges, including franchised colleges in Greece.

8. Promoting adult learning

Raising participation in adult education remains a key challenge. The share of adults participating in learning decreased from 4.5%, in 2018, to 3.9% in 2019 (EU average: 10.8%). The percentage of low-qualified adults participating in learning is, at only 0.8%, among the lowest in Europe (EU average: 4.3%). A dedicated project has been launched to increase the participation of low-skilled adults in learning and improve their core skills, including digital skills.

The development and validation of distance teaching and counselling skills for educators in the public and private sector is vital. Quality e-learning training programmes are underdeveloped. The Ministry of Education is planning to develop a crash course (15 hours) in digital skills and distance learning for all public sector teachers.

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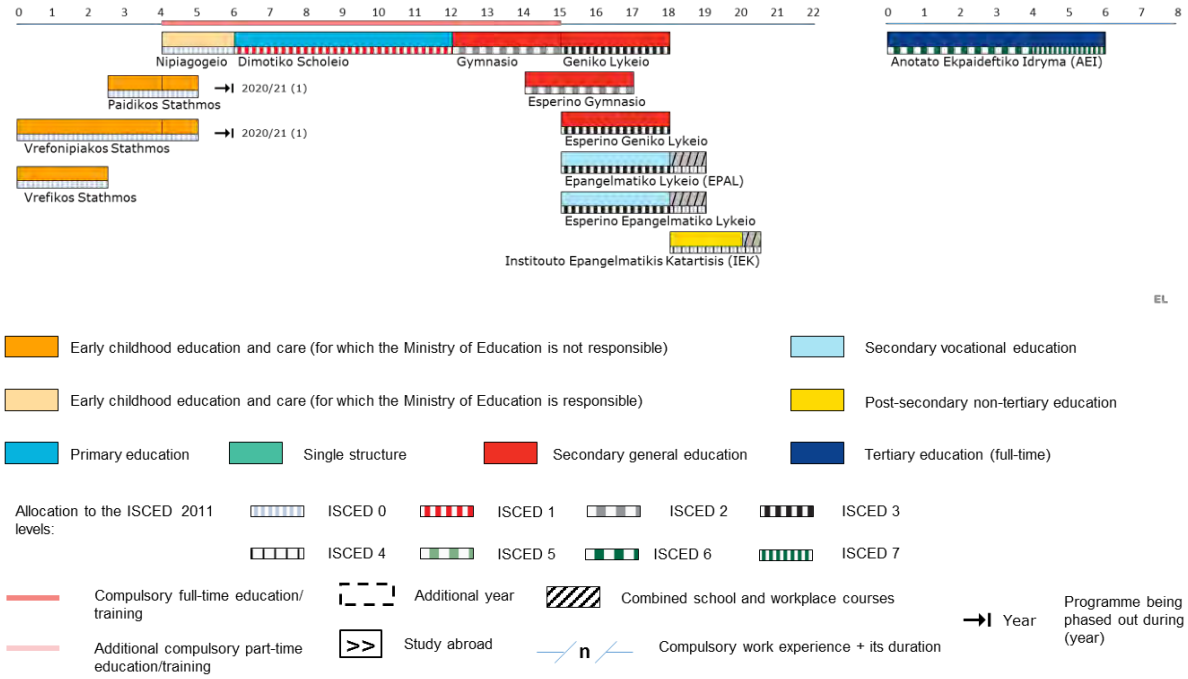
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24edat_lfse_24
Adult participation in learning	trng_lfse_03trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_expgov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Ulrike PISIOTIS
Ulrike.PISIOTIS@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

European Commission

HUNGARY

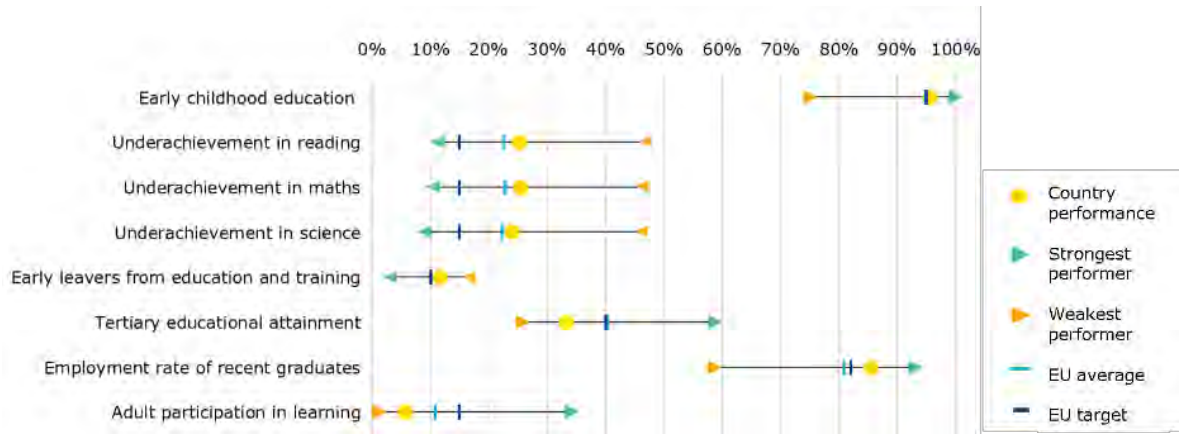
1. Key indicators

Figure 13 – Key indicators overview

			Hungary		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			11.5%	11.8%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			24.0%	33.4%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			94.8%	95.7% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		17.6%	25.3% [18]	19.3%	22.5% [18]
	Maths		22.3%	25.6% [18]	22.2%	22.9% [18]
	Science		14.1%	24.1% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		75.5%	85.6%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		3.0%	5.8%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	4.7% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	3.7% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		5.4% [p]	5.1% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€3 397 [12]	€3 736 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€3 316 [12]	€6 362 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€6 830 [12]	€8 565 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		11.4%	11.9% [u]	12.6%	8.9%
	Foreign-born		: [u]	: [u]	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		23.6%	33.2%	32.0%	41.3%
	Foreign-born		41.3%	39.5%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		66.4%	82.6%	72.2%	75.9%
	ISCED 5-8		84.8%	89.5%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include Spain; b = break in time series; d = definition differs, p = provisional, u = low reliability, : = not available, 12 = 2012, 16 = 2016, 17 = 2017, 18 = 2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Further support for digital education is needed to boost digital skills.
- There is a continued high share of underachievers and early school leavers.
- A new financing model is expected to help higher education institutions operate more flexibly.
- The new VET strategy and law have introduced major changes but provide little room to develop basic skills.

3. A focus on digital education

Hungary needs to boost digital skills. The share of digitally supportive schools at all ISCED levels is lower than the European average (Deloitte et al., 2019). Such schools have strategies for digital teaching and learning, and strongly promote teachers' professional development. The share of highly digitally equipped and connected schools at ISCED levels 1 to 3 is also lower than the EU average (Deloitte et al., 2019). 73% of people aged 16-19 estimate that they have at least basic digital skills, which is below the EU-27 average (82%) according to the 2019 Digital Economy and Society Index (DESI). The government launched the digital prosperity programme to boost the digital capacity of individuals and companies, one arm of which is the digital education strategy (2017-2020). Its aim is to prepare the education and training system to meet the needs of a digital society and economy in terms of infrastructure, technology, content, work organisation and human resources.

The switch to distance learning during the lockdown highlighted teachers' uneven preparedness and pupils' varying access to digital learning. Schools were closed from 16 March until the end of the school year, with classroom teaching provided on demand. The upper-secondary school leaving exams took place only in writing. Evidence from the yearly national competence tests suggests that around 20% of pupils had no or very limited access to digital education (Hermann, 2020), possibly exacerbating the learning deficit of disadvantaged learners. To support families during the lockdown period, municipalities and school district centres distributed daily free school meals for disadvantaged pupils and those attending classroom teaching.

A dedicated agency helps implement the digital education strategy. The Digital Pedagogical Methodology Centre (*Digitális Pedagógiai Módszertani Központ; DPMK)* was established in 2016 to develop a digital competence framework based on the EU framework and assessment tools for all types of educational institutions. The government adopted an outline of the digital competence framework in 2019 (Government, 2019a). DPMK promotes good practices through the Digital Thematic Week (see Box) and supports schools in implementing their digital development plans. DPMK also supports the spread of numerous initiatives of schools, NGOs and private companies in fields such as robotics, maker spaces, online content and resources. The agency organised over 30 webinars during the school closure to inform teachers about the use of available tools and digital pedagogy.

The new core curriculum can increase digital competence. It was published in January 2020 and will apply from September 2020. One of its novelties is the subject 'digital culture', which covers informatics, digital communication and information search. The ICT Association of Hungary welcomed the digital competence objectives defined in the core curriculum, while stressing that they could only be achieved if, for example, schools had sufficient resources to procure, maintain and replace their digital tools and teachers received continuing professional development in digital competences (IVSz, 2020). The Association also strongly recommends including the required level of digital competence within learning outcomes, e.g. in the upper-secondary school leaving exam.

Box 1: Making schools more digital: the Digital Thematic Week

The government's Digital Thematic Week initiative started in 2016, with the participation of some 785 schools. About 5 400 teachers and 79 000 students participated in digital education projects during this week. The Week has been organised annually since its launch, attracting increasing numbers of participants. The 2020 Week was originally scheduled for March, but as digital education suddenly became the norm due to the school closures participation was extended to the end of May and reached over 700 schools.

The Digital Thematic Week is coordinated by DPMK to promote digital education at school, beyond the boundaries of IT classes. Participating teachers and students can develop their skills through diverse and creative school projects. School groups can participate in free programmes provided by the partner organisations. The programmes are published on the DPMK website, and the agency also helps schools and partners prepare their applications. Schools can either create their own project or take inspiration from 12 ready-made sample project kits and numerous pedagogical guides. The Digital Thematic Week teachers' Facebook community provides a forum to exchange ideas and professional experiences.

https://digitalistemahet.hu/

4. Investing in education and training

Public expenditure is above the EU average. General government expenditure on education in 2018 surpassed the EU average, both as a proportion of GDP (5.1% v 4.6% EU-27) and as a proportion of total general government expenditure (11% v 9.9% EU-27). The 2017-2018 spending rise in real terms (4.2%) went mainly to higher education, while spending on primary and pre-primary education did not increase and, in secondary and post-secondary non-tertiary education, spending dropped by 0.8%. According to the 2020 State Budget Act, expenditure on primary and general secondary education is nearly HUF 600 billion (~EUR 1 810 million), similar to the 2019 level. In 2018, some 800 school buildings were refurbished with EU funding, which represents around 10% of all schools.

The number of schools has not been aligned to the reduced school population, with risks for public spending efficiency. The year-on-year decrease in the school population was 0.8% in 2019/2020 (KSH, 2020a), while the decline between 1990 and 2016 was 10 times greater than the decrease in the number of primary schools. This reduces efficiency: the proportion of unused school capacity increased to 48% in secondary education in 2018/2019 (OH, 2019a) and is particularly large in vocational grammar schools (44%) and vocational training schools (65%). The pupil-teacher ratio was 10.2 in primary education in 2018, against an EU average of 13.6[143]. Maintaining the large number of schools has effectively increased parental choice and the scope for segregating students by socio-economic status (Radó, 2018).

5. Modernising early childhood and school education

Action to improve access and quality of early childhood education may help reduce child development differences. 95.7% of children aged 4-6 participate in early childhood education, above the EU average (94.8%). In 2016, Roma participation was 91%, close to the national average and by far the highest among Member States in the region (FRA, 2016). As performance gaps appear at early ages, lowering the age of compulsory participation in kindergarten from age 5 to 3 from 2015/2016 has been a positive step that is likely to improve children's later performance at school. In 2018, 16.5% of children under 3 attended childcare (EU average: 34.7%). All children below school age are eligible for early childhood education services and providers are expected to

[143] Eurostat: [educ_uoe_perp04]

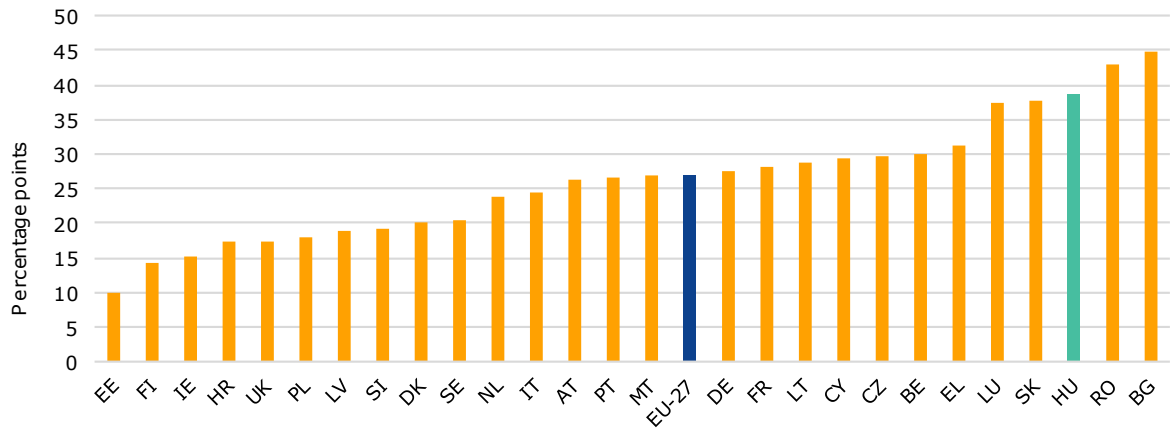
provide specialised support to disadvantaged children. Regional coverage of services remains unbalanced: in 2017 nearly 30% of municipalities had no pre-primary schools (Varga, 2019).

Parents' freedom to request a delay for starting school has been reduced. An amendment to the Act on National Public Education in July 2019 changed the rule for enrolling children in primary school as of January 2020. Where previously kindergarten heads could allow a one-year extension of pre-school attendance instead of proceeding to primary school in case of immaturity, the new regulations make this possibility subject to an expert decision issued by the Education Authority and require parents to apply for a permit in January. The stated purpose of the amendment is to eliminate exceptions and misuses that are unfavourable to the child. The change met large-scale criticism from parents, psychologists, pre-school teachers, and professional organisations, who warn of a long-term negative impact on the educational outcomes of immature children. The Commissioner for Fundamental Rights requested postponing the amendment on the grounds of legal certainty and potential infringement of the rights of the child (Ombudsman, 2019).

Educational outcomes are below the EU average in the latest survey of the OECD Programme for International Student Assessment (PISA 2018). At the age of 15, mean levels of basic skills are significantly below the EU averages and have decreased since 2009, with the sharpest decline in science. The share of low achievers is well above the EU average in all three areas tested: 25.6% in mathematics, 25.3% in reading and 24.1% in science, compared to 22.4%, 21.7% and 21.6% respectively at EU level. The shares of underperformers in reading and science have increased significantly since 2009 (by 8 and 9 pps respectively). The share of top performers in each of these subjects is below the EU average and has declined.

Socio-economic background is a strong predictor of pupil performance and large differences between schools remain. In 2018, advantaged pupils scored on average 113 points higher than their disadvantaged peers in reading, the second widest gap in the EU, corresponding to around 3-4 years of schooling. Schools are characterised by the similar socio-economic background of their pupils, with concentrations of disadvantaged pupils in certain schools - the gap in pupils' performance between socio-economically advantaged and disadvantaged schools is the largest in the EU (169 points). Performance-based selection starting at the age of 10 leads to the separation of underachieving pupils from their high-achieving peers, which is likely to be a factor in the large share of low performers in Hungary (European Commission, 2019). For example, the difference in reading performance between pupils enrolled in general education and vocational programmes exceeds 100 points. Only 1.4% of disadvantaged students were admitted to higher education in 2017 (Varga, 2019). In its 2020 country-specific recommendation, the Council of the EU recommended that Hungary take measures to ensure access to quality education for all (Council of the European Union, 2020).

Figure 3 – Underachievement gap in reading by socio-economic status, in percentage points, 2018



Source: OECD 2019, PISA 2018. Note: The EU average does not include ES results.

In 2019, the early school leaving rate improved slightly but remained above the EU average. In 2019, the rate of early leavers from education and training decreased for the first time in 3 years (11.8% v an EU-27 average of 10.2%). The rate is higher in the least developed districts and among Roma (65.3%). Participation of 17 and 18 year-olds in secondary education dropped sharply between 2011 and 2016 (from 98% to 85%), after vocational secondary training was shortened to 3 years in 2010 and the age of compulsory education was lowered from 18 to 16 in 2012. The concentration of disadvantaged pupils in certain schools and school types – especially vocational training schools – makes it difficult to retain such pupils in school and to give them the individualised help they need to develop. Disadvantaged schools are most affected by teacher shortages, and they have no means to attract more experienced teachers and extra support staff. The distribution of pupils at risk of dropping out varies greatly by school type and region. In the three most affected counties, 13-15% of pupils are concerned[144]. For vocational training in these three counties, the rate is 20-24%. Early school leaving correlates strongly with local education outcomes, which are lowest in rural settlements (OH, 2019c), where the capacity to provide quality education is more limited and teacher shortages are more pressing. Hungary has the largest urban/rural gap in education outcomes, before accounting for socio-economic status, of all OECD countries (OECD, 2019b).

Equity challenges continue. In 2001-2016, the proportion of church schools in basic education increased from 5% to 15.8% and from 10.4% to 22.8% in upper-secondary education (Varga, 2019). Church schools are exempt from some legislative restrictions and do not participate in system-level desegregation measures, thereby limiting the measures' impact. The proportion of basic schools with a Roma population of 50% or higher increased from 10% in 2008 to 15% in 2017, partly reflecting the demography of the locality in which the school is located. Since the compulsory school age was decreased from 18 to 16 years, the proportion of 17 year-olds who are not in employment, education or training has increased from 3% to 5-6% (Köllő-Sebők, 2019a) and reaches 40% among 17 year-old Roma boys (Köllő-Sebők, 2019b). This increase in inactivity among 17 year-olds is worrying, because their risk of long-term unemployment is very high.

In July 2020, a law was adopted to establish specific police forces to maintain order in educational institutions. The law also reduces the age of criminal prosecution to 12 years-old for acts against public officials and people in public service (teachers). Furthermore, it punishes any crime by a pupil by suspending their family allowance for 12 months. The government justified the proposal by referring to the growth of violent acts against teachers and fellow pupils. The Teachers' Trade Union considers that the law only serves to intimidate pupils but contains no preventive measures (PSz, 2020); they question the use of chemical substances, sticks and handcuffs against minors within schools and that there is no mention of the relationship between the principal and the school guard. Instead they propose employing at least one full-time school psychologist per 200 pupils and substantially increasing the number of development and special education teachers, especially in disadvantaged regions. The Trade Union also argues for a review of child protection, increasing the number of professionals in this field and for enhanced cooperation of family protection officials and social workers with teachers.

The shortage of teachers is increasingly challenging. The teaching workforce is ageing. In 2017, 41% of teachers were over 50, while only 6% were under 30. Initial teacher education cannot meet the demand for teachers: the number of applicants has increased in recent years, but dropout rates are high and less than half of graduate teachers actually enter the profession[145]. The shortage is most significant in disadvantaged areas, for science subjects and foreign languages, and in vocational education and training. Low salaries are one factor – these are equivalent to only 61%-70% of the salaries of other tertiary graduates (OECD, 2019). In addition, the number of teaching hours remains high. As of August 2020, teachers receive a 10% salary supplement. The National Chamber of Teachers (NPK, 2019) called for bigger increases in the salary scale for the

[144] https://www.kir.hu/kir2esl/Kimutatas/VeszelyeztetettTanulokMegoszlasa Accessed on 20.05.2020.

[145] Source: KIR-STAT database

first 10 years of a teacher's career, and to restore the ratio between the starting salary and the minimum wage to where it was in 2013[146].

A revised national core curriculum (*Nemzeti Alaptanterv; NAT*) was adopted in January 2020. Contrary to expectations, learning and teaching burdens have not been reduced. There is some decrease in the number of lessons in a few subjects, but the amount of content to be taught has not been adjusted. The structure of the NAT has also changed, with subjects being grouped into broader subject areas of education. The central framework curricula detailing the new NAT were published in February 2020 and will be applied from September 2020 in the first, fifth and ninth grades. Schools had until the end of April 2020 to adjust their local curricula to the framework curricula. Therefore, there was less than 6 months to develop the local school curricula and prepare teachers. This implementation period was not extended despite the exceptional circumstances linked to distant learning.

Box 2: Development of digital competences and ICT infrastructure in education

European Social Fund (ESF) project: HRDOP-3.2.4-16

Duration: 2017-2020

Budget: HUF 46.4 billion, EUR 136 million

This is the biggest component of a package of four large-scale investment projects realised in 2016-2020. Its aim is to equip all state schools in the less developed regions – representing 70% of the population – with Wi-Fi, to provide teachers with laptops and ICT training and to equip 800 schools with tablets. Some 45 000 teachers and 24 000 pupils benefit directly from the project.

Results so far include:

- installation of Wi-Fi in 2 600 schools;
- provision of laptops and training for 45 000 teachers;
- provision of tablets for 800 schools (30 tablets per school; 24 000 tablets altogether).

Three further projects complement the package:

- centralised development of digital education content and development of the National Education Portal (www.nkp.hu) displaying digital education content (HRDOP-3.2.2-15);
- centralised development of digital pedagogical methodologies, assessment and evaluation (HRDOP-3.2.15-17) to define digital competence levels at different levels of education;
- digital environment in public education (HRDOP-3.2.3-17), supporting the majority of state and non-state schools through 60 projects to purchase IT equipment, IT training and IT support.

Up to EUR 200 million has been invested, of which 85% is financed by the ESF.

https://kk.gov.hu/digitalis-kompetencia-fejlesztese

6. Modernising vocational education and training

Participation in initial VET is increasing and VET graduates fare well on the labour market. The employment rate among recent VET graduates was 86.3% in 2019, exceeding the EU average (79.1%). This corresponds to the overall high share of employment among the population aged 25-55 (84.3%) (KSH, 2020b). In 2016, only 43% of vocational training school graduates worked in skilled labour; with the majority working in unskilled jobs (Köllő, 2017). A 2015 amendment of the VET law restructured the two tracks in VET. The higher track, which had been classified as general education because of its limited vocational content, was reclassified as VET.

[146] A teacher's salary corresponded to 157.8% of the guaranteed minimum wage in the case of a bachelor's degree and to 172.9% in the case of a master's degree according to the 2013 amendment of the Act on National Public Education.

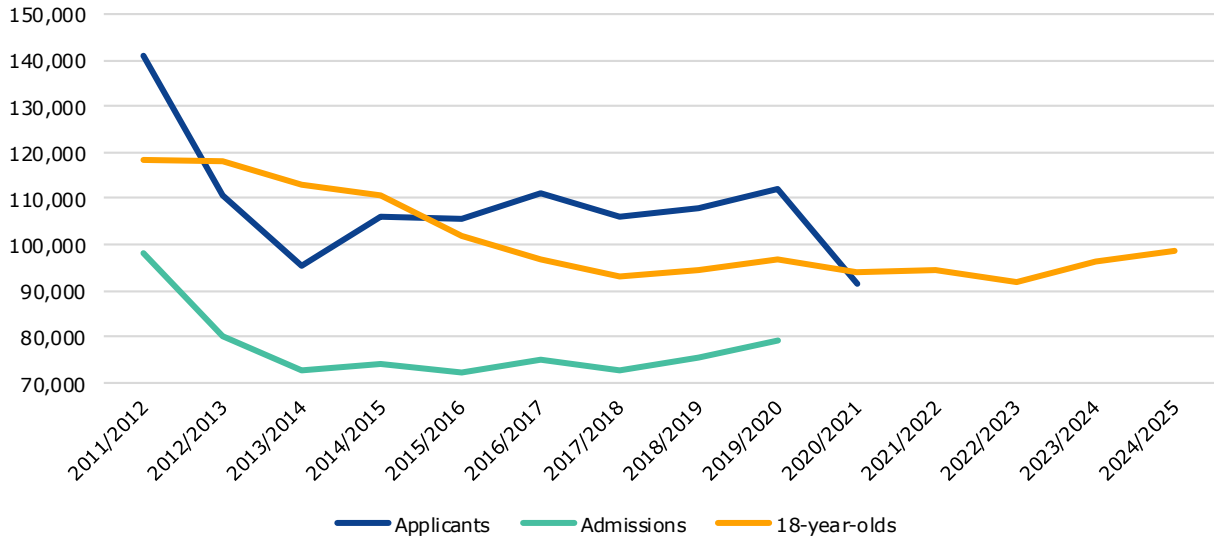
Vocational content was increased at the cost of general education and graduates of the new 'vocational grammar school' could obtain both a secondary school leaving examination certificate and an ISCED 3 level qualification.

A 2019 law on vocational education and training aims to attract more students to both vocational tracks. The law (Government, 2019b) introduced major changes to the vocational tracks, before the full roll-out of the previous reform introduced in 2016/2017. Vocational grammar schools – the path with a higher element of general education – were transformed into five-year 'technical schools' (*technikum*) and will lead to both general secondary education and vocational qualifications. However, there will be no possibility to transfer from these schools with a secondary school leaving certificate (*matura*) before the final exam in the fifth year. The name 'vocational grammar school' (*szakgimnázium*) refers to a five-grade secondary school providing training in arts, pedagogical assistance or culture. Vocational secondary schools – for less academically inclined pupils – will become three-year 'vocational schools' (*szakképző iskola*) and will no longer be combined with an additional two-year cycle leading to a *matura*. A novelty of both schools is the sectoral basic education in the first 1 or 2 years. The choice of the specific profession is thereby postponed to age 15-16, allowing a more informed career choice. The government allocated additional HUF 35 billion (~EUR 106 million) to increase teachers' salaries in VET in 2020. As from September 2020, vocational teachers have become employees under the Labour Code and their salaries are no longer paid according to the unified pay scale and career model of teachers (Government, 2019b).

7. Modernising higher education

The growing demand for a highly skilled workforce is not met by a sufficient number of tertiary graduates. The employment rate of recent tertiary graduates in 2019 was 89.5%, well above the EU average of 85%, reflecting strong demand for highly skilled workers. However, against the background of demographic decline and high outward migration, current enrolment and completion trends make it hard to respond to this high demand, with only a 33.4% tertiary educational attainment rate among 30-34 year-olds in 2019 (EU-27: 40.3%). Admission conditions were further tightened in 2020. An advanced level *matura* exam result became the general entry condition. This resulted in a 20% decline in applications for 2020-2021 (Fig. 4). The dropout rate in higher education is around 30%.

Figure 4 - Number of applicants and admissions into higher education (2011- 2020) and 18 year-old population (2011 - 2024)



Source: Central Admission Database (felvi.hu); calculations based on the data of the Central Statistical Office (KSH; http://www.ksh.hu/nepszamlalas/tablak_demografia)

The government has increased the student support budget of tertiary institutions. Tertiary institutions receive an institutional budget to pay various forms of student support. The value of normative student support, on whose basis this budget is calculated, increased in two steps, in September 2018 and in February 2020, resulting in a total increase of 40%. The amount of support for socially disadvantaged students in 2019 was EUR 191 for bachelor studies and EUR 291 for master's programmes. From February 2020, this support increased by 30%.

A new financing model is expected to help higher education institutions operate more flexibly. A public foundation established in 2019 holds all the estates of the Corvinus University of Budapest, and the dividends arising from the university's extensive State-allocated assets can be used to run the institution. The university therefore became exempt from the scope of the Budget Law which covers all public institutions. The aim was to help it operate more flexibly and cooperate more efficiently with businesses for innovation purposes. In 2020, the government decided to transfer its governance role in seven other universities to asset management foundations set up specifically for this purpose. This solution is somewhat different from the one used for the Corvinus University, as the governing foundations do not receive significant capital or wealth, but are funded by the State under a 15-20 year framework contract and a 3-5 year higher education service order and funding contract. The government will evaluate the institutions' performance regularly. The announced changes met with protests from the senate and students of the University of Theatre and Film Arts. They warned that, by transferring founding rights to the foundation, external control over the board of trustees will be eliminated and the senate will be deprived of its decision-making power, posing a serious threat to universities' autonomy (SzFE, 2020). Opposition to these changes hardened at the start of the new academic year.

8. Promoting adult learning

Recent steps aim to promote adult learning. Only 5.8% of adults participated in learning activities in 2019, well below the EU average of 10.8%. The 2019 VET law introduces shorter and more flexible training for 'basic qualifications' for adults. It also introduces the Register of Vocational Professions (*Szakmajegyzék*). Participation in training provided by VET institutions to obtain two basic qualifications included in the Register of Vocational Professions and one short cycle vocational qualification will become free. Changes in adult education will be introduced gradually between 2020 and 2022, and participation in training to obtain the first two basic qualifications remains free of charge. The 2020 national reform programme includes measures to further train unemployed people, or those employed in short-term working schemes, via distance learning. The government encourages IT and entrepreneurship training for micro and small businesses and contributes to tuition fees.

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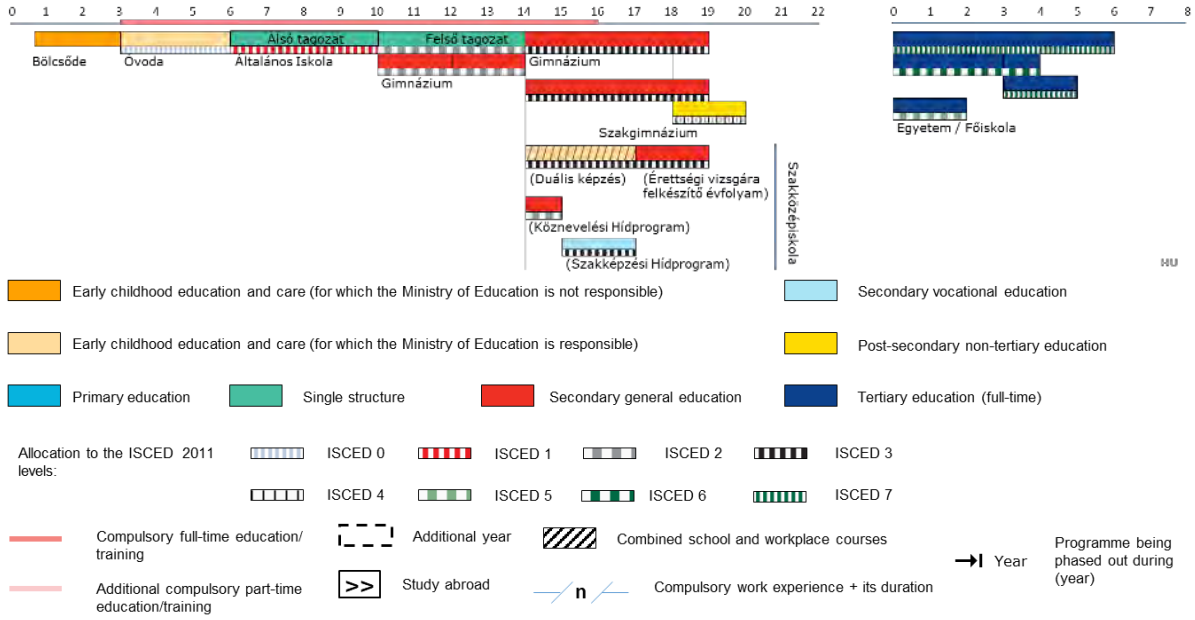
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Livia RUSZTHY
Livia.RUSZTHY@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

IRELAND

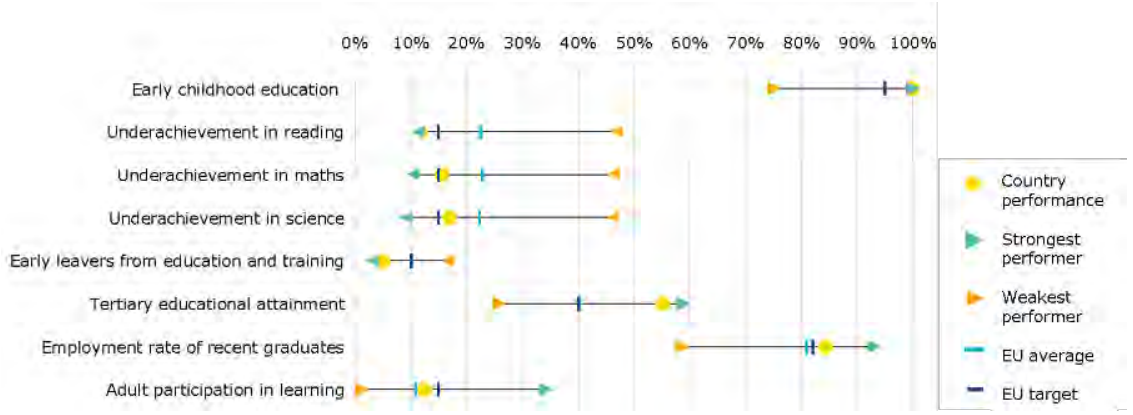
1. Key indicators

Figure 14 – Key indicators overview

			Ireland		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			11.8%	5.1%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			50.4%	55.4%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			73.6%	100.0% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		17.2%	11.8% [18]	19.3%	22.5% [18]
	Maths		20.9%	15.7% [18]	22.2%	22.9% [18]
	Science		15.2%	17.0% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		77.3%	84.5%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		6.6%	12.6%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	5.8% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	: [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		4.7%	3.2% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€7 147 [12]	€6 432 [16]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€9 095 [12]	€6 995 [16]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€11 500 [12]	€9 996 [16]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		11.2%	5.3%	12.6%	8.9%
	Foreign-born		14.9% [u]	4.2%	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		48.5%	53.2%	32.0%	41.3%
	Foreign-born		56.4%	59.5%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		65.0%	73.0%	72.2%	75.9%
	ISCED 5-8		84.3%	91.0%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs; u = low reliability; : = not available; 12 = 2012, 16 = 2016, 17 = 2017, 18=2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Digital skills are gaining more attention in school curricula, but clearer guidance on digital-learning policy is needed.
- Early childhood education and care continues to be a major focus of policy and programme reform.
- Despite increased public spending on education, public investment in higher education remains low, and the impact of COVID-19 is likely to aggravate the situation.
- Ireland has set out a new strategy for further education and training (2020-2024), focused on building skills, creating pathways and fostering inclusion.

3. A focus on digital education

Ireland is strengthening digital education and the digital skills of the wider population. Building on the previous programme for ICT in schools, the digital strategy for schools 2015-2020[147] aimed to embed information and communication technology (ICT) more deeply across the school system. The strategy addressed four themes: teaching, learning and assessment through ICT; continuous professional development; leadership, research and policy; and ICT infrastructure. Since 2018, the digital learning framework[148], which is a key part of the strategy, has provided a structure for schools to effectively embed digital technologies into teaching, learning and assessment activities. The framework outlines the digital skills expected of students, teachers, and school heads, and supports curricular reforms in both primary and post-primary schools. Through the third ICT-skills action plan (Technology Skills 2022), the government aims to increase by 65% the number of ICT graduates by 2022 (DES, 2019a), with a view to meeting 70% of the annual demand for high-level digital skills forecast for the period (Irish Government, 2020). Ireland performs better than the EU average in advanced digital skills, and the average skills of the wider adult population have improved from a low base over the past 2 years, although they remain below the EU average (European Commission, 2020).

The level of ICT infrastructure in schools is satisfactory overall, but disparities exist. Under the digital strategy for schools, EUR 210 million for ICT infrastructure has been distributed to schools over the past 5 years. However, only a third of primary school students attend highly equipped and connected schools (EU 35%), indicating further investment needs, in particular for connectivity, operational equipment and virtual learning environments (European Commission, 2019a; Cosgrove et al., 2020; Eivers, 2020). The COVID-19 pandemic has revealed disparities in the digital readiness of schools and society: 39% of primary school principals reported the existence of a 'digital divide' and difficulties in providing distance learning, in particular to children in vulnerable family situations (Burke, J. and Dempsey, M., 2020). At secondary level, 14% of students lack access to a computer to complete classwork (OECD, 2019b Vol. II). In April, a special EUR 10 million fund was announced for the purchase of technology and devices for disadvantaged students at primary and post-primary level, in particular for schools participating in the DEIS programme, which seeks to give special help to schools in disadvantaged areas[149]. In 2020, Ireland received a country-specific recommendation from the Council of the EU to 'address the risk of digital divide, including in the education sector' (Council of the EU, 2020[150]).

Young people's digital skills are improving, but university graduates report a need for more advanced digital skills. The proportion of individuals aged 16-19 who consider that they

147 DES (2015) Digital Strategy for Schools 2015-2020 Enhancing Teaching, Learning and Assessment, October 2015. https://www.education.ie/en/Publications/Policy-Reports/Digital-Strategy-for-Schools-2015-2020.pdf;

148 http://www.erc.ie/programme-of-work/dlf/

149 https://www.education.ie/en/Press-Events/Press-Releases/2020-press-releases/PR20-04-22.html

150 https://ec.europa.eu/info/publications/2020-european-semester-country-specific-recommendations-commission-recommendations_en

have above-basic digital skills increased by 10 pps between 2015 and 2019 to 53%, close to the EU average of 57%. In the same period, the proportion who assessed their overall digital skills as low fell to 22% (EU-27 15%)[151]. This progress reflects the impact of measures introduced under the digital strategy, including: (i) coding classes at primary level; (ii) digital technologies being embedded across the lower secondary curriculum; and (iii) the introduction of computer science as a subject in the school-leaving examination. Computer science is taught using an innovative 'continuing-professional-development' model, where teachers emphasise group and project work, and prepare students for computer-based assessment. At tertiary level, fewer than half of students (46%) believed that their course prepared them for the digital workplace (NFETL, 2020).

Improving digital education requires clear policy and support for teachers' digital skills. The 2018 Programme for International Student Assessment (PISA) results show that Irish school principals at secondary level are less positive than the EU average about their schools' capacity to improve teaching and learning through technology. Their main concerns are: (i) insufficient access to technical support; (ii) a lack of professional resources for teachers on using ICT in teaching; and (iii) a lack of ICT skills among teachers (O'Brien, C., 2019). Secondary school students in Ireland are also less likely than students in other countries to use digital devices for classwork in school or at home (OECD, 2019b Vol. II). The recent evaluation of digital learning by the Inspectorate of Ireland's Department for Education and Skills (DES), the Irish education ministry, concluded there was a need for a continued strategic approach to the development of digital learning across the system, which should address gaps in the digital readiness of schools (DES, 2020). Commentators also underline a need for clearer policy guidance, greater focus on quality, and better use of Open Educational Resources (Marcus-Quinn et al., 2019).

4. Investing in education and training

Ireland continues to increase expenditure on education as its population grows. According to national projections, primary school enrolments peaked in 2018 and post-primary enrolments will peak in 2025 (OECD, 2020). Public expenditure on education as a proportion of GDP is not a fully reliable indicator, given the specific structure of Irish GDP[152]. Measured as a percentage of the total public budget, Ireland spent 12.6% on education in 2018 (EU 9.9%), an increase since 2015 (when it was 11.4%). Ireland spent 42.1% of its education budget on pre-primary and primary education, one of the highest shares in the EU (EU 34.1%). However, spending on tertiary education at 15.6% still remains below the EU average (16.4%). Overall, between 2010 and 2018, general government expenditure on education increased by 23% in real terms (COFOG). The government's 2020 budget committed to increase spending on special education, small schools, and support to teaching principals (DES, 2019c); 30 000 additional school places are to be delivered in response to demographic growth (Irish Government, 2020).

Despite the increase in spending, public expenditure on higher education remains low given the growing number of students. Between 2013 and 2018, the number of enrolled students increased by 39.3% in Bachelor's programmes, and by 19.36% in Master's programmes[153], among the highest increases in the EU (in the EU-27, these increases were 0.3% and 3.0% respectively). Between 2010 and 2018, general government expenditure on tertiary education increased by 32% in real terms (COFOG). Private spending also plays a significant role: the relative share of private spending on tertiary education at 28% is higher than the EU-23 average of 23.7%, even though the vast majority of students (95%) are enrolled in public higher-education institutions (EU-27 83.0%)[154] (OECD, 2019a). Commentators argue that cuts to core third-level funding during the economic crisis of 2008 have never been reversed, leading to a growing reliance on attracting international students (Mooney, 2020). As student numbers continue

[151] Eurostat: [isoc_sk_dskl_i].

[152] Using GDP, the figure would be 3.2% in 2018, whereas using the GNI* specifically adapted to Ireland, it would be 5.3% (DG EAC own calculations based on Eurostat, UOE, 2018).

[153] Eurostat, UOE: [educ_uoe_enrt02].

[154] Eurostat, UOE: [educ_uoe_enrt01].

to increase, insufficient funding has affected student welfare services and the availability of university-owned accommodation[155]. In November 2019, the European Commission funded under the Structural Reform Support Programme a review of how to increase the future sustainability of higher and further education in Ireland (European Commission, 2019b).

Ireland is making progress on the 2019 action plan for education. The third progress report of 31 October 2019 concluded that 36 actions (80%) had been completed (DES, 2019d). However, a number of policy goals remain outstanding, including the further implementation of a refined identification model for targeting socioeconomically disadvantaged schools, and a policy on out-of-school education.

The urgent closures of education and training institutions due to COVID-19 may have long-lasting effects. In response to the crisis, the national action plan set priorities for education and training. These priorities included: (i) guidance to education institutions; (ii) developing contingency plans to address closures of schools and lost tuition time, prioritising students in exam years; (iii) developing alternative arrangements for State examinations; (iv) planning for the potential impact of the pandemic on tertiary education. With all schools and third-level institutions closed since mid-March until the end of the school year, students were highly reliant on their families to support their studies, with potential negative implications for vulnerable groups. The National Council for Special Education provided additional support for students with special educational needs and their families. The Higher Education Authority estimates that third-level institutions will have a EUR 500 million shortfall as a result of the pandemic, mainly due to a drop in international students.

Box 1: Stakeholders' involvement in decision-making after COVID-19

To advise on necessary decisions about secondary-level State examinations, an advisory group has been formed comprising representatives of students, parents, teacher unions, management bodies, and the Department of Education and Skills[156]. The group met regularly until September to provide guidance on a range of areas including supporting student wellbeing and minimising the pandemic's impact on vulnerable groups. There have also been calls for the Department to ensure expert oversight of the process to maintain consistency in calculated grades based on schools' continuous assessment.

5. Modernising early childhood and school education

Reform efforts to improve the quality and affordability of early childhood education and care (ECEC) continue. In 2018, the participation rate for children aged 4 and older continued to be 100%[157]. Policy reforms in ECEC centre on improving affordability, access and the quality of provision[158]. Based on the Childcare Support Act of 2018[159], the national childcare scheme[160] was launched in November 2019, providing financial support towards the cost of ECEC and school-age childcare during the hours spent outside of pre-school or school. Income-based subsidies are available to families with household incomes of up to EUR 60 000 per year. The quality of training provided to teachers is central to the reforms planned by the government. However, providers face difficulties in recruitment, retention and financial incentives for staff. To address these difficulties, a workforce development plan (under development) aims to raise the profile of careers in ECEC by

155 https://www.independent.ie/irish-news/education/students-welfare-is-at-risk-as-funding-cuts-of-550m-bite-38941326.html.

156 'Advisory Group for Contingency Planning for State Examinations', https://www.education.ie/en/The-Department/Regulation-of-Lobbying-Act-2015/Groups-Committees-exempted-under-the-Transparency-Code/advisory-group-contingency-planning-for-state-exams-2020.html.

157 ECEC participation includes participation in primary schools as well as ECEC centres.

158 https://first5.gov.ie/

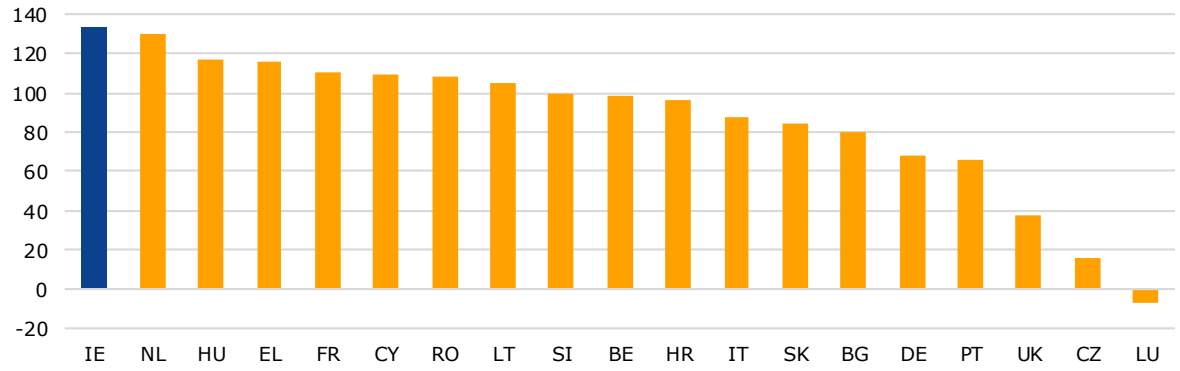
159 Childcare Support Act 2018, No 11/2018: https://www.oireachtas.ie/en/bills/bill/2017/153/.

160 https://www.dcya.gov.ie/docs/EN/11-03-2019-National-Childcare-Scheme/5189.htm

establishing role profiles, qualification requirements, a career framework, and leadership-development opportunities. The draft childminding action plan[161], which aims to regulate childminding and funding over a ten-year period, has been published for stakeholder consultation. Due to the temporary closure of all ECEC facilities since mid-March due to COVID-19, the government has announced supporting measures, including a new temporary wage-subsidy scheme and repurposed funding for the ECEC and school-age childcare sectors. A funding package of EUR 375 million and health-and-safety guidance has been provided to support reopening of schools[162] and services from 29 June to 31 December[163].

Ireland performs well overall in basic skills. According to the OECD's PISA results for 2018, Ireland remains above the EU average in student performance in maths and science, and close to the top in reading. Following a decrease in the proportion of low performers in maths and reading by 5 pps between 2009 and 2018, Ireland has one of the lowest proportions of low achievers in the EU. Low performers in reading are 11.8% of all students (EU-27 22.5%); in maths they are 15.7% (EU-27 22.9%); and in science they are 17% (EU-27 22.3%). However, the performance gap between students in general and students in vocational programmes (whose reading performance is 133 points lower - equivalent to 3 years of schooling) is the highest in the EU (Figure 3). The proportion of top-performing students in maths fell by 3.1 pps between 2003 and 2018 to 8% (EU-27 11%), and in science fell by 3.6 pps between 2006 and 2018 to 6% (EU-27 6.3%). The long-term trend in average performance in science (2006-2018) is also downward, in particular since 2012. The changes brought by the lower secondary reform aimed to support the development of students' critical thinking will be reflected in the 2022 PISA testing.

Figure 3 – Mean score difference in reading between general and vocational programmes, PISA 2018



Source: OECD (2019c), PISA 2018.

The focus on equity in education has made Irish secondary schools positive forces for inclusion and social mobility. The impact of students' socioeconomic background on their performance remains limited. This is reflected in lower-than-EU-average variance in reading performance explained by background (10.7% against 14.2% at EU level). The proportions of students from the lowest socioeconomic quartile who are academically resilient (who scored in the top quarter of reading performance), at 13%, as well as of those who expect to complete tertiary education (62%), are among the highest in the EU. Although the proportion of students with a migrant background doubled in Ireland to 18% between 2009 and 2018, the proportion of low performers among them is one of the lowest in the EU (13.8% v EU-27 31.3%). Following a marked decrease in the proportion of low achievers in reading among boys (by 8 pps between 2009 and 2018), the gender gap is now narrow in all three test domains and progress is echoed later on in the narrowing of the gender gap in tertiary educational attainment. The reduced

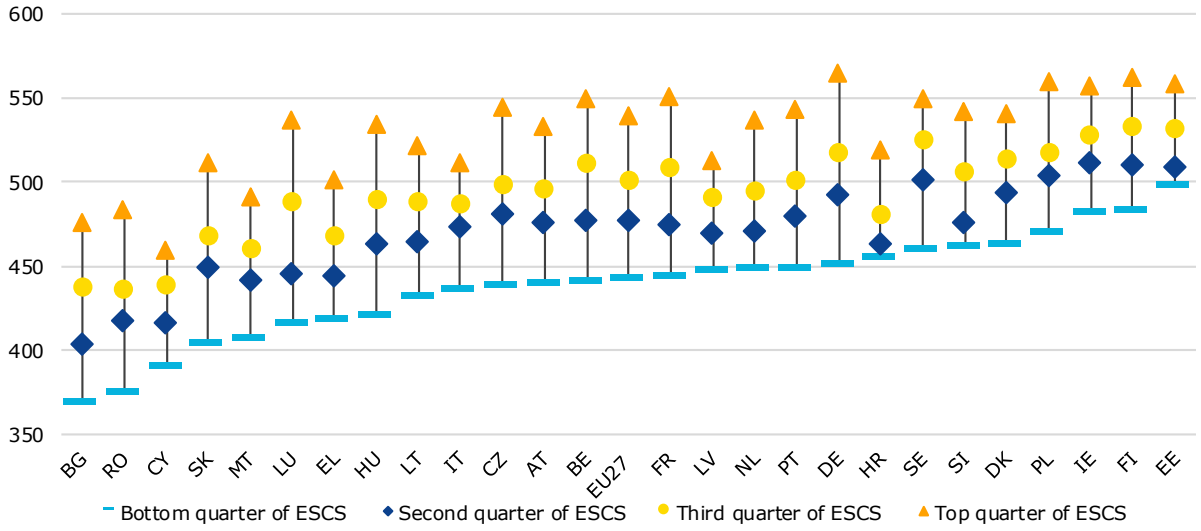
161 https://www.gov.ie/en/press-release/e78d18-minister-zappone-launches-open-policy-debate-on-draft-childminding-a/

162 https://www.education.ie/en/Press-Events/Press-Releases/2020-press-releases/PR20-07-27.html

163 https://www.gov.ie/en/publication/240258-up-to-date-information-on-covid-19/

proportion of low achieving students and comparatively low variation between schools reflect the effectiveness of the measures taken in recent years to create an equitable and high-performing education system (Figure 4).

Figure 4 – Mean performance in reading by socioeconomic status, PISA 2018



Source: OECD (2019), PISA 2018. Note: The EU average does not include ES results.

The school disciplinary climate requires improvement. More than 1 in 5 students (22.7%) reported being bullied a few times a month, an increase of 8 pps compared to 2015, and now equal to the EU average. Close to a third of students (30%) reported having skipped a day of school (EU-27 24%). Contrary to the situation in other EU countries, more girls reported skipping school than boys (by 4.5 pps). This goes alongside a decrease in the reported sense of belonging at school, which declined by 6.6 pps between 2015 and 2018. This aspect is particularly important since students who reported a sense of belonging at school scored higher in reading by 13 points (EU-27 8 points) (OECD, 2019b, Vol. III). The issue of student wellbeing has been prominent in national consultations around upper secondary education, intensified by the school closures due to COVID-19, and is likely to provide a rationale for reform (Smyth et al., 2019; Mohan, G. et al., 2020).

The rate of early leavers from education and training (ELET) remains low, at 5.1% in 2019. This is substantially below the Europe 2020 national target of 8% and the EU-27 average (10.2%). However, certain groups, in particular Irish Travellers and Roma[164], still have high ELET rates. Under the national Traveller and Roma inclusion strategy (2017-2021), a set of actions are underway to close educational gaps for these groups, including establishing a multi-disciplinary pilot project to improve school attendance and retention (Irish Government, 2020).

Ireland continues to modernise its school curricula. A new draft primary curriculum framework has been published for consultation until the end of 2020. The main changes proposed are framed around: (i) increased autonomy and flexibility for schools as 'curriculum-makers'; (ii) stronger connections between children's experiences from pre-school to post-primary school; (iii) an updated set of priorities for children's learning and development; and (iv) new pedagogical approaches and strategies with assessment central to teaching. The new framework also aims to align primary education with the new framework for lower secondary education (Irish Government, 2020). There has been a review of senior cycle programmes and vocational pathways, to include Transition Year, Leaving Certificate Applied, Leaving Certificate Vocational Programme and the Leaving Certificate Established. The related advisory report will form the basis of further discussion and decision making on senior cycle over the coming years.

[164] https://www.education.ie/en/Publications/Statistics/Statistical-Reports/Membership-of-the-Traveller-Community-2000-2001-2015-2016.pdf.

Ireland aims at full alignment with the UN Convention on the Rights of Persons with Disabilities regarding participation in mainstream education. In 2019, a pilot of the school inclusion model was launched to support inclusive education in mainstream primary and secondary school settings (NCSE, 2019). The model aims to build schools' capacity to include students with additional needs and to provide them with the necessary support.

Concerns persist over teacher supply and different pay scales. The issue of teachers' different pay scales (teachers employed after 2010 earn significantly less) gave rise to a one-day strike on 4 February 2020[165]. The DES report of December 2019 indicates that there will be 38 000 excess teachers by 2038 due to demographic patterns (DES, 2019b). The report was challenged in some quarters, and in particular by teachers' unions[166].

6. Modernising vocational education and training

The national further education and training (FET) strategy 2020-2024 has been published. Priorities for the sector are set out across three pillars: building skills, creating pathways, and fostering inclusion. There is also a strong focus on enabling themes, including staffing, capital investment, measurement and data. Between 2016 and 2020 significant modernisation and expansion in apprenticeships has been implemented, with the introduction of 35 new apprenticeship programmes. Fifteen of which were launched in 2019/2020 with a further 20 currently under development. This expansion reflected the introduction of a range of new consortia-led programmes in emerging areas of skills needs including ICT-related programmes, engineering, finance and logistics. The first Quality and Qualifications Ireland level 10 apprenticeship (level 8 in EQF) was launched in August 2020[167].

Online learning during COVID-19 has proved challenging for FET[168]. Education and Training Boards (ETBs), third-level providers, and private providers moved courses online where possible. The government agency SOLAS provided its online learning service 'eCollege' free of charge to learners, which is expected to boost the enrolment numbers. Data for 2019 shows that 12 800 individuals enrolled in eCollege[169]. The key challenges include: (i) assessing learners; (ii) maintaining motivation; and (iii) tackling social isolation, inadequate digital skills, the lack of IT equipment, or of an internet connection. The 2017-2019 SOLAS technology-enhanced learning (TEL) strategy for FET addresses integrating TEL into FET. To build capability in the sector, ETBs collaborated with the National College of Ireland and the National University of Ireland, Galway to create three blended courses in TEL.

7. Modernising higher education

Ireland aims to increase graduate numbers in science, technology, engineering and maths (STEM) and establish consistent quality assurance among public higher-education institutions. In 2019, the tertiary attainment rate was 55.4%, one of the highest in the EU (EU-27 average: 40.3%), and is likely to increase further. Ireland's Europe 2020 national target is 60%. The attainment rate among foreign-born people is 59.5% - among the highest in the EU. Almost three quarters of students (73%) are enrolled in Bachelor's programmes and only 15% in Master's programmes (EU 29% enrolled in Master's programmes). The proportion of STEM graduates has increased, reaching 24.1% in 2018 (EU-27 25.4%). The employment rate of recent graduates is slowly growing, and in 2019 it reached 84.5% (EU-27 80.9%). To support new undergraduate places and courses in high-priority areas, such as science, engineering, ICT and construction,

165 https://www.thejournal.ie/teachers-strike-equal-pay-4990920-Feb2020/

166 https://www.into.ie/2019/12/02/reports-of-teacher-oversupply-utter-nonsense-claim-into/

167 http://www.apprenticeship.ie/en/news/Pages/List%20of%20Apprenticeships%20in%20Ireland%20-%20Generation%20Apprenticeship.pdf

168 ETBI, 'Report - Further Education and Training COVID19 Response', 2020, https://library.etbi.ie/ld.php?content_id=32846179.

169 https://www.solas.ie/f/70398/x/f94d9b8147/15083_solas_fet_services_plan_2019_data_sheet_web.PDF

EUR 24 million was provided to tertiary institutions under pillar 2 of the government's human capital initiative[170]. In January, the Minister for Education and Skills announced the granting of autonomous award-making powers, except for doctorates, to all institutes of technology (IOTs – third-level institutions without university status), placing them on an equal footing with universities. Under the initiative, IOTs are expected to establish regional and thematic clusters with other autonomous tertiary institutions under the national strategy for higher education to 2030[171]. In June, an additional 17 000 upskilling and reskilling places were approved under the Springboard+ initiative and pillar 1 of the human capital initiative[172].

Efforts to improve access to higher education for vulnerable groups continue. In response to lower-than-anticipated progress for Travellers under the national access plan for higher education, the government launched an action plan to promote Traveller participation in higher education in 2019 (Irish Government, 2020). Through initiatives such as the programme for access to higher education, the Student Assistance Fund and the Fund for Students with Disabilities, EUR 27 million was spent to support 30 000 higher-education places for students from vulnerable groups. However, inequalities persist: recent research confirms that people from wealthier backgrounds are more likely to go to third level, and that they will also immediately earn significantly more than people from disadvantaged backgrounds (HEA, 2019).

Higher-education institutions may switch to 'blended learning' due to COVID-19. All third-level institutions have gone largely online since mid-March and many are planning to use a 'blended learning' approach in the new academic year. According to a survey launched in autumn 2019, 71% of Irish students rated the overall quality of digital teaching and learning as above average (NFETL, 2020). However, there is no clear evidence yet on how effective online learning has been for student learning and engagement. Before March, more than two thirds of teaching staff (70%) had never taught online.

8. Promoting adult learning

In 2019, adult participation in learning at 12.6% was above the EU average of 10.8%. A specific challenge for the adult learning system will be the response to the economic shock caused by COVID-19, resulting in further needs for upskilling and reskilling among newly unemployed people. In the first 6 weeks of lockdown, the unemployment rate quadrupled. It is estimated[173] that the unemployment rate will rise to 18% in Q2 2020 before falling back to just under 11% in Q4. In response to this challenge SOLAS, in partnership with the relevant departments, ETBs and industry representatives, has developed an immediate activation initiative 'Skills to Compete'.

Half of adults risk exclusion from the workforce due to a lack of digital skills (European Commission, 2020). Although Ireland ranks sixth in Europe for digitalisation, only 55% of adults have basic or better-than-basic digital skills (EU 58%). With the COVID-19 crisis, people with poor digital skills face the additional challenge of engaging with new modes of delivery and assessment. In 2018, the report on digital transformation[174] resulted in the government setting up the EXPLORE programme to improve lifelong learning, digital skills and upskilling among manufacturing-sector employees aged 35 or older (Condon and Burke, 2020). NALA[175], the national adult-literacy agency, delivers literacy support through distance learning.

170 https://www.education.ie/en/Press-Events/Press-Releases/2019-press-releases/PR19-12-16.html

171 https://www.education.ie/en/Publications/Policy-Reports/National-Strategy-for-Higher-Education-2030.pdf

172 https://www.education.ie/en/Press-Events/Press-Releases/2020-press-releases/PR20-06-17.html

173 https://www.esri.ie/system/files/publications/QECSPRING2020.pdf.

174 https://www.regionalskills.ie/imagelibary/regional%20skills%20-%20national/publications-/publications-pdf/ns%20bulletin%202018.pdf

175 https://www.nala.ie/policy/nalas-policy-work-in-education-and-training/

Box 2: Professional Accountancy Training (PAT)

ACCA Ireland (the body that certifies accountancy qualifications) and PAT (a provider of accountancy training) have recognised that there is a shortage of skills and talent at the entry/intermediate levels in finance and accounting. With difficulties in filling jobs through traditional routes, employers are looking into other recruitment channels. These include upskilling existing staff or recruiting non-accounting graduates and training them. PAT have collaborated with the ACCA to deliver a diploma in accounting and business at level 6 under the NFQ and a diploma in professional accounting at level 7. The courses are delivered in two learning modes: part-time evening classes with live streaming, and e-learning.

To increase learners' motivation, retention and progression, PAT invested significantly in technology and the 'gamification' of learning. The approach has proved extremely popular and the feedback has been very positive.

In 2019, there were 185 learners enrolled in the programme. The learning community comes from 20 of the Republic of Ireland's 26 counties, is 63% female, and made up of 13 nationalities. 60% of those enrolled are Irish.

ESF contribution: EUR 27 376

Website: https://professionalaccountancytraining.com/

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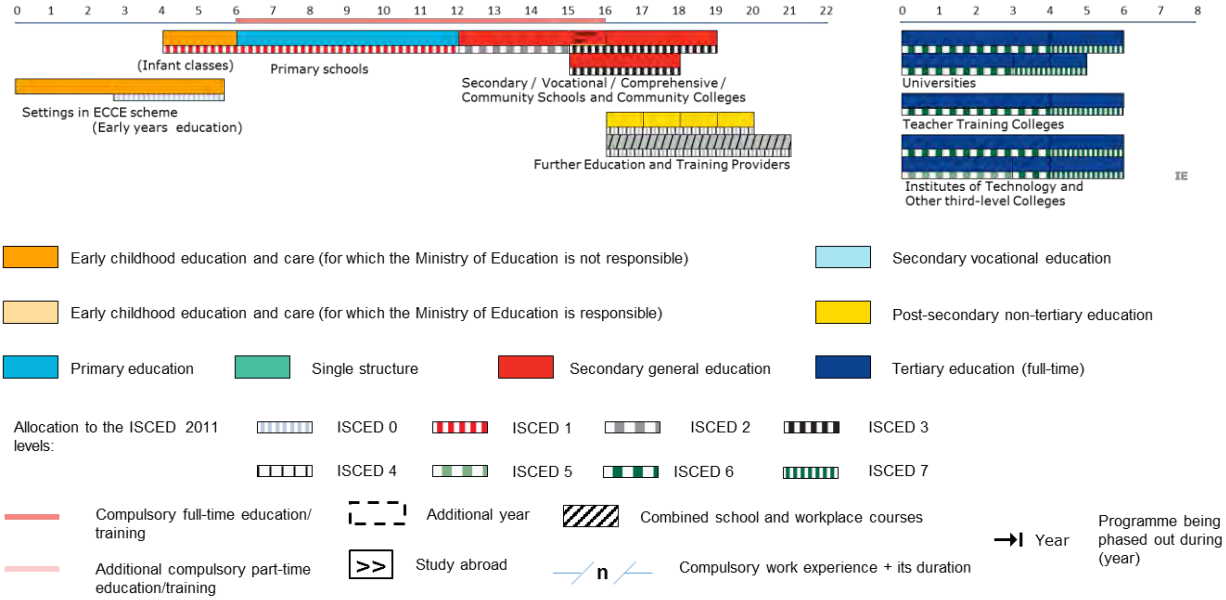
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Sylwia SITKA
Sylwia.SITKA@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

ITALY

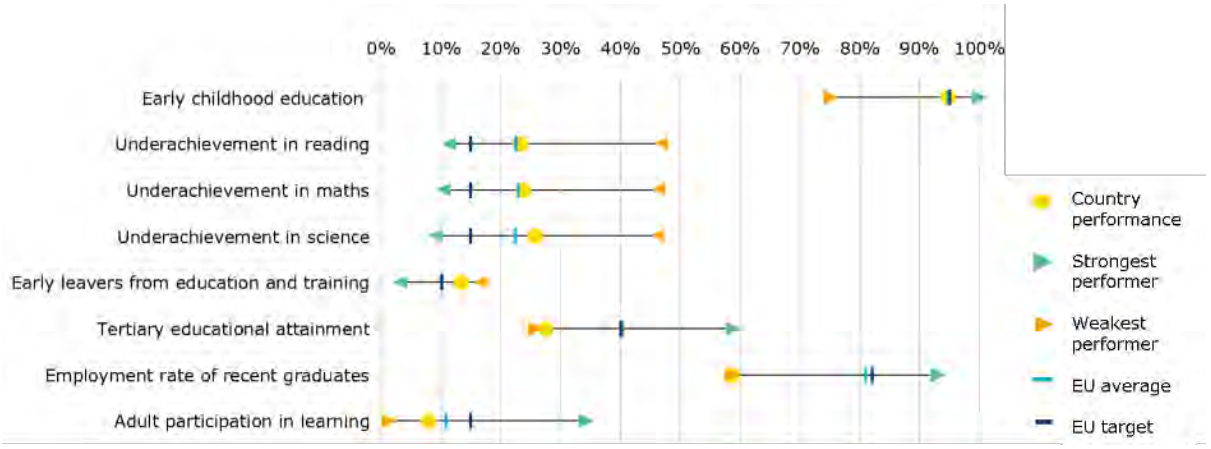
1. Key indicators

Figure 15 – Key indicators overview

			Italy		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			19.1%	13.5%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			19.0%	27.6%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			99.8%	94.9% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		21.0%	23.3% [18]	19.3%	22.5% [18]
	Maths		25.0%	23.8% [18]	22.2%	22.9% [18]
	Science		20.6%	25.9% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		60.6%	58.7%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		6.0%	8.1%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	4.8% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	8.9% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		4.5%	4.0% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€6 141 [12]	€6 622 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	: [12]	€7 579 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€7 771 [d, 12]	€8 514 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		16.6%	11.3%	12.6%	8.9%
	Foreign-born		42.1%	32.3%	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		20.0%	31.2%	32.0%	41.3%
	Foreign-born		12.9%	13.9%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		55.9%	52.9%	72.2%	75.9%
	ISCED 5-8		66.1%	64.9%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs, : = not available, 12 = 2012, 16 = 2016, 17 = 2017, 18 = 2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- The early school leaving rate is declining but remains above the EU average, particularly among the foreign-born population, while the tertiary attainment rate remains low.
- During the COVID-19 crisis most schools were able to implement distance learning at very short notice, but efforts are needed to include vulnerable students and increase quality.
- The recent reform of vocational education and training (VET) is expected to improve its labour market relevance, especially at local level.
- Transition from education to work is difficult, leading to a growing outflow of highly qualified young people.

3. A focus on digital education

Italy's current policy framework for digital education is the National Plan for Digital Schools (*Piano Nazionale Scuola Digitale* – PNSD), adopted under the 2015 school reform. Before the plan's adoption in 2016, government action had been limited to funding specific activities[176] with support from European Structural Funds for a total expenditure of EUR 494 million. The PNSD's stated objective is to transform Italian education through innovation and the use of information and communication technologies (ICT) for teaching, learning and school management. The plan aims to coordinate the action of a variety of players (schools, municipalities, private foundations, regional governments) and different sources of funding, including structural funds. The plan lists 35 actions covering every aspect of schools' digitalisation, from infrastructure and IT equipment to redesigning classrooms and strengthening the digital competences of both teachers and pupils. The Ministry of Education monitors the plan's implementation, but no data has been made public so far. he COVID-19 crisis has led the government to step up investment in the digitalisation of schools (see Section 5).

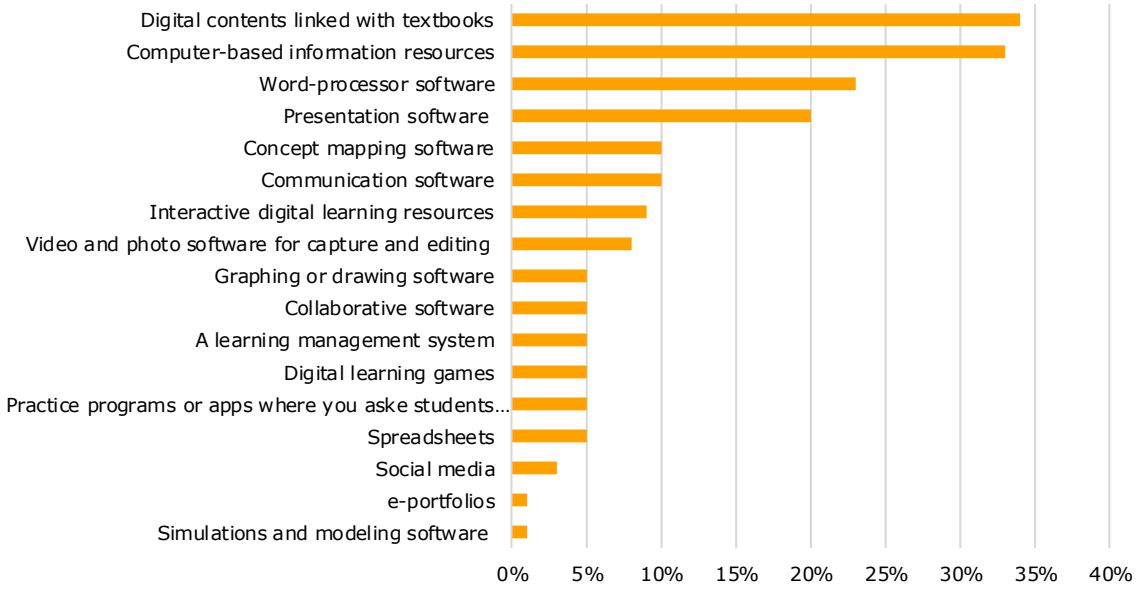
Schools are digitally equipped in line with other EU countries, but the level and speed of connectivity lags behind. While virtually all schools have an internet connection (95,4%, MIUR), only 26.9% have a high speed connection, well below the EU average of 47%. Insufficient internet access is reported by 43% of school leaders (OECD, TALIS 2019) (EU-22 23.8%). Students' confidence in their digital competence is comparable to the EU average, as is the share of students who use a computer at school on a weekly basis. By contrast, the proportion of teachers who feel well or very well prepared to use ICT for teaching is lower than the EU-22 average (35.6% v 37.5%) (OECD, TALIS 2019). The COVID-19 crisis has led the government to step up investment in the digitalisation of schools (see Section 5).

An ageing teaching workforce with insufficient ICT skills contributes to the slow progress of digital innovation in teaching. In 2018, 68% of teachers reported having participated in in-service training in ICT for teaching in that year, a marked increase over 2013 (15 pps), and only 16.6% felt a strong need for ICT training, below the EU-22 average of 18% (OECD, 2019). However, while the share of teachers who frequently or always let students use ICT for projects and class work grew from 30% in 2013 to 46.6% in 2018, only 35% of teachers reported using ICT when teaching in most or every lesson in 2018, compared to 72% in Finland and 49% in Portugal. In addition, teachers tend to use ICT mainly to consult information sources (33%) and content linked to textbooks (34%), in line with a frontal teaching approach, while only a minority uses interactive learning resources, practice programmes or learning games (Figure 3). The lack of familiarity with more innovative digital technologies for teaching may reflect the age composition of the teaching workforce[177], and the need to strengthen in-service training in ICT for older teachers.

[176] E.g: generalised introduction of interactive whiteboards, strengthening Wi-Fi connectivity in selected schools, promotion of ICT training centres for teachers.

[177] In 2017, 58.6% of teachers were over 50, and 18% were over 60 (European Commission 2019b).

Figure 3 - Teachers who reported using digital learning ICT tools in most lessons, almost every, or every lesson, 2018



Source: IEA International Computer and Information Literacy Study 2018 International Report.

The switch to distance learning caused by COVID-19 highlighted the need to ensure equal access to all learners, particularly those from disadvantaged backgrounds, already at risk of exclusion. A national survey by the Ministry of Education found that virtually all schools were able to put in place remote learning activities, and only 2.6% of students did not have access to any form of distance learning. However, according to the national statistical office, in 2019 over 12% of children aged between 6 and 17 lived in families with no PC or tablet (rising to almost one fifth in the south), and only 6% lived in families with at least one PC per person. In addition, 4 out of 10 children lived in overcrowded conditions (Istat 2020). The Council of the European Union adopted a country-specific recommendation for Italy under the 2020 European Semester to 'strengthen distance learning and skills, including digital ones' (Council of the European Union, 2020).

Between March and June 2020, the government allocated EUR 201.7 million to support distance learning. Measures include the acquisition of digital devices for schools to enable students to participate in distance learning.

Box 1: Integrating traditional textbooks with self-produced digital educational content

Avanguardie Educative (Educational Avant-garde) is a network of Italian schools created in 2014 on the initiative of INDIRE, Italy's national institute for research in education. Its purpose is to rethink the Italian school model, still strongly classroom-lecture-activity-based and constrained by rigid organisation of the schedule. Over the years the network has grown from the initial 22 schools to 100.

Among the innovative ideas promoted by *Avanguardie Educative* is *CDD/Libri di testo* (where CDD stands for *Contenuti Didattici Digitali* or Digital Didactic Content). The idea is to go beyond the traditional printed textbook associated with lecture-centred schooling by involving students in creating the content of their books. The CDD Textbooks Guidelines argue that the textbook should be a 'canvas' that guides class activity, filled with content connected to the particular context of the school. The aim is to overcome the concept of studying as just rote learning; creating digital content implies cooperation among the whole class, a critical use of different tools and resources in the analysis of various languages, and the development of social skills.

For students, designing and producing the 'pages' of a textbook involves a range of skills that include information retrieval, understanding and interpreting collected data, formulation of hypotheses and concepts, and their formalisation and representation in a form appropriate to

their communication. It also means experimenting with new forms of writing using the tools offered by digital support and students' reflection on such new forms.

For teachers, the production of texts in class can be a way to produce content adapted to different learning needs, motivate students through their active involvement and link content to the local area.

The production of digital content (or textbooks) is an opportunity to re-adjust the curriculum according to specific needs of a particular context and the demands and characteristics of the school and the student. It allows marginal themes of the curriculum to be addressed, such as local history and topics that are not present in traditional textbooks, and allows students to express their ideas about their reality and re-establish a more authentic relationship with their world.

http://innovazione.indire.it/avanguardieeducative/cdd

4. Investing in education and training

Despite a slight increase in 2018, Italy's education expenditure remains among the lowest in the EU. General government expenditure on education in 2018 increased in real terms by 1% on the previous year, but remains well below the EU average, both as a proportion of GDP (4% v 4.6%) and as a proportion of total general government expenditure, which at 8.2% is the lowest in the EU (9.9%). While the share of GDP allocated to pre-primary, primary and secondary education is broadly in line with EU standards, expenditure on tertiary education is the lowest in the EU, both as a percentage of GDP (0.3% v 0.8%) and as a proportion of government expenditure on education (7.7% v 16.4%). It is worth noting that while general government expenditure on education declined by 7% overall in 2010-2018, expenditure on higher education was cut by 19% over the same period.

Teachers' salaries make up the largest share of education expenditure. Over three-quarters of the education budget (76%) was spent on employee compensation in 2018, (EU average 65%), while expenditure on intermediate consumption and gross capital formation were well below the EU average (10% and 3% respectively; EU 13% and 7%).

Extra funding was made available to mitigate the impact of the COVID-19 crisis. As part of its response to the COVID-19 crisis the government allocated almost EUR 3 billion to alleviating the economic impact on students, families, schools and universities. The funds are equally divided between the school and higher education sectors (EUR 1.45 billion and EUR 1.5 billion respectively) and will be used for various needs, including preparations for school reopening, financial support for students, organisation of open competitions to recruit teachers, and school building and maintenance work. Administrative procedures for school construction and maintenance have been simplified in order to enable local governments (owners of the buildings) to intervene more rapidly.

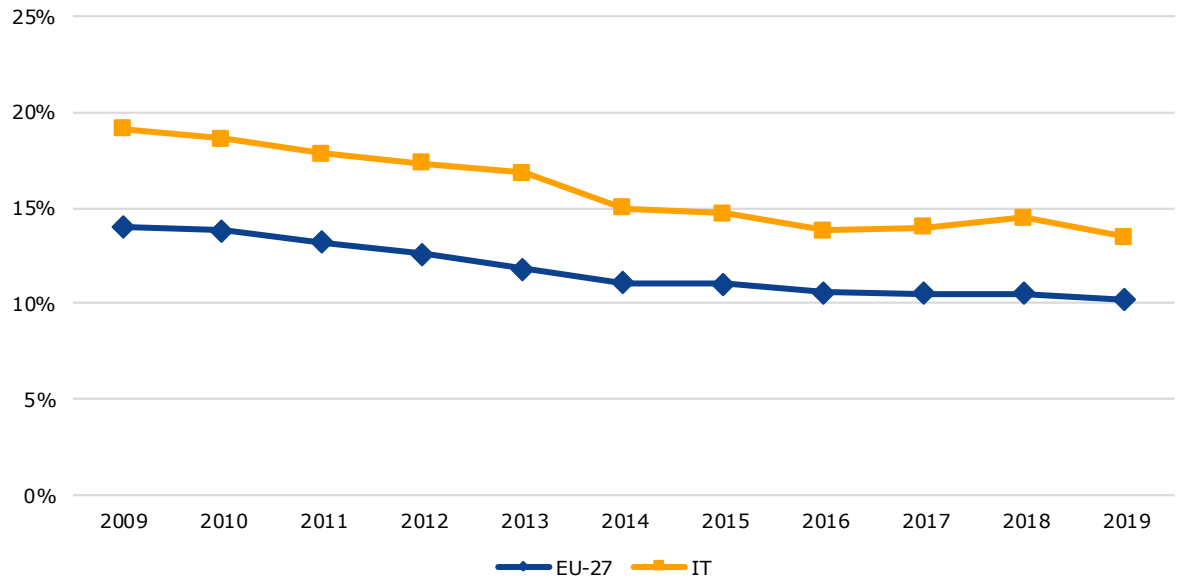
5. Modernising early childhood and school education

Participation in early childhood education (ECE) is almost universal for 4-6 year-olds, but enrolment of younger children is low. 95% of 4-6 year-olds were enrolled in ECE in 2018, in line with the EU average of 96.4%. By contrast, only 25.7% of children below three were enrolled in formal childcare, compared to 34.7% in the EU, with major disparities across regions (European Commission 2019c). The 2020 Budget Law strengthened financial support for families with children aged 0-3 enrolled in ECE, and implementation of the `integrated education system from 0 to 6´ introduced by the 2015 school reform is expected to improve coverage and reduce geographical disparities. COVID-19 emergency legislation allocated an extra EUR 15 million to the latter, as well as EUR 165 million to compensate nursery schools for lost fees.

Early school leaving (ESL) is again on a declining trend, but remains among the highest in the EU, particularly in the south and among the foreign-born population. The proportion of early leavers from education and training in the 18-24 age group was 13.5% in 2019, down from 14.5% the previous year, confirming the downward trend of the past decade (Figure 4). While

below the national target of 16%, the ESL rate remains well above the EU average of 10.2% and falls considerably short of the EU 2020 benchmark of 10%. ESL rates vary widely across regions, from 9.6% in the northeast to 16.7% in the south. Boys are more likely than girls to be early school leavers (15.4% v 11.3%). At 32.5%, the ESL rate for foreign-born 18-24 year-olds is almost three times as high as for natives (11.3%) and considerably higher than the EU average of 22.2%.

Figure 4 - Early leavers from education and training, (18-24), 2009 - 2019



Source: Eurostat, Labour Force Survey: [edat_lfse_14].

School education in Italy produces mixed results in terms of basic skills proficiency, with significant differences between regions and types of schools. Compared to 2015, Italian 15 year-old students' performance in the 2018 OECD Programme for International Student Assessment (PISA) remained broadly stable in mathematics and reading but worsened in science, in line with international trends. The percentage of low performers is close to the EU average in reading and maths, but higher in science[178]. There is significant geographical variation, with students in the north of the country scoring well above the EU average in reading, and students in the south and islands significantly below. In a system characterised by early tracking, performance also varies according to type of school: students in upper general education (*licei*) obtain a much higher score (521 points) than those in technical and vocational institutes (458 and 395 points respectively). Differences between regions and schools are also reflected in the distribution of top- and low-performing students (PISA 2018).

No effort has been made to assess the learning loss caused by school closures. As the 2020 round of national standardised testing was cancelled, the first indications won't be available until the next round of testing in June 2021.

Socio-economic background has a comparatively limited influence on learning achievement, but influences expectations. A student's socio-economic background was found to account for a difference of 75 score points in reading, well below the EU average of 97. However, when it comes to career expectations, only 59.5% of high-performing disadvantaged students expected to complete tertiary education, against 88% of their advantaged peers. This may contribute to Italy's low tertiary education attainment rate (see also Section 7).

Gender stereotypes are pervasive and may impact career choices. While girls are better at reading than boys (by 25 score points, in line with the EU average), they are outperformed in maths by 16 points, the largest gap in the EU. The average gender gap in science is negligible, but

[178] 23.3% in reading (EU-27 22.5%) 23.8% in maths (EU-27 22.9%) 25.9% in science (EU-27 22.3%).

rises to 11 points in favour of boys among top-performing students. Among top performers in science or mathematics, boys are twice as likely as girls to expect to work in science or engineering when they are 30, while the opposite is true for the health professions.

Integrating foreign students remains a challenge. Compared to native students, foreign students[179] are at higher risk of grade repetition (27.3% v 14.3%) and of dropping out of school (2.92% v 0.45%)[180]. Compared to Italian-born students of similar ability[181], they also tend to enrol disproportionately in vocational (VET) schools offering little prospect of progressing to higher education, as opposed to technical and academically-oriented high schools[182]. This could ultimately have long-term effects on the skills and occupational careers of children with a migrant background, reducing social mobility and creating unequal opportunities (Cardana et al., 2019).

The government is taking steps to address the regional divide in competence achievement. In January, the Ministry of Education presented an action plan to reduce geographical gaps in education. The plan anticipates the identification of troubled schools (*scuole 'in difficoltà'*) in five southern regions[183] and the creation of a task force in each region involving Ministry representatives, local administrators and ministerial research agencies (INDIRE, INVALSI) entrusted with analysing existing data and proposing interventions addressing key competences , effective learning, variance in results, and school effectiveness. While a step in the right direction, further efforts will be necessary to address some of the underlying factors in the unequal quality of education, such as excessive teacher turnover, which tends to deprive disadvantaged schools of the best teachers (European Commission 2019c), the lack of effective management tools based on quality monitoring and appraisal of teachers and school leaders; and students' motivation in a context of low economic returns to education.

Box 2: Strengthening schools' educational offer to combat early school leaving in Campania

'Scuola Viva' is a project launched by the Region of Campania in the school year 2016/2017 with European Social Fund (ESF) funding. The project aims to structure and strengthen schools' educational offer and related networks, promote social innovation and inclusiveness to combat early school leaving, including by expanding, diversifying and enriching cultural experiences within training paths. The activity takes the form of thematic modules, at each school's choice, with a duration of at least 30 hours each, such as educational and technical/professional workshops for the development of basic skills; art, theatre and music workshops, recreational activities, psychological counselling, direct involvement of families and enterprises. To date, around 450 schools have been financed each year. Around 420 000 students from different types of school have been involved, with an average of 26 enrolled pupils per laboratory. The educational workshops activated each year amounted to 4 000 for a total of more than 150 000 hours of activity for the school population and the territory of the region as a whole.

Project `Scuola Viva´ – OP ESF Campania 2014-2020

Project period: 2016 – 2021

Budget (total cost): EUR 25 million per year (total allocated: EUR 100 million)

Website: www.scuolavivacampania.it

App: Viva Campania School

179 The definition includes children born in Italy to foreign parents.

180 School years 2015/2017 and 2017/2018 (Sources: MIUR, Istat)

181 As measured by the standardized INVALSI test administered in grade 8.

182 76.5% of 2019 university graduates had a high school (*liceo)* diploma, and only 2% a VET school diploma (Almalaurea, 2020).

183 Campania, Calabria, Sicily, Sardinia and Apulia.

6. Modernising vocational education and training

The educational content of VET has been redefined by the State-Regions Conference. The resulting agreement updated the national classification (repertory) of professional profiles (*Repertorio nazionale di figure professionali*) and is expected to improve the labour market relevance of VET provision, especially at local level.

The government revised the work-based learning pathways (*Alternanza Scuola-Lavoro*) and renamed them 'Pathways for transversal competences and guidance'[184]. The objective is to facilitate the acquisition of skills for personal and professional development, allowing learners to put into practice the competences acquired at school and to develop transversal competences through real tasks in operational contexts. Additional funding has been allocated to the establishment of new Higher Technical Institutes.

During the COVID-19 crisis, many regional VET providers moved their learning towards distance mode and strongly developed digital competences of teachers, trainers and learners. Project work online and simulations were introduced to replace the practical training that could not take place in laboratories and companies.

The 'Rilancio' Law Decree of 19 May 2020, converted into Law 77 of 17 July 2020, created the 'New Skills Fund' (NSF) focused on active labour market policies. The NSF combines the need to reduce the consequences on employment of the Covid-19 emergency with training of workers. As for its budget, an initial amount of EUR 230 million by the OP SPAO has been increased by EUR 500 million by the 'Agosto' Law Decree, and it will allow companies to be compensated for reduction in working time under condition that the worker attends continuing vocational training.

7. Modernising higher education

Italy's tertiary educational attainment rate declined slightly in 2019, and is one of the lowest in the EU. At 27.6% in 2019, the share of 30-34 year-olds with tertiary education is above the Europe 2020 national target of 26%-27%, but well below the EU average of 40.3%. At 13.9 % (EU average 35.3%), the attainment rate is particularly low among foreign-born people. Science, technology, engineering and mathematics (STEM) graduates make up 24% of all graduates, only slightly below the EU average of 25.4%. At 19 pps, the STEM gender gap is significantly lower than the EU average of 25 pps. The share of female graduates is higher than the EU average across STEM disciplines, most notably in engineering, where women make up 32% of graduates (EU-28%).

Tertiary enrolments are projected to fall sharply following the COVID-19 pandemic. According to some estimates, shrinking household budgets and a lower willingness to move for health reasons could result in 35 000 fewer university enrolments in the 2020/2021 academic year, an 11% decrease from the previous year, representing a loss of EUR 46 million in tuition fees (Osservatorio Talents Venture 2020). The Ministry of University and Research has therefore decided to allocate an additional EUR 290 million to students' financial support. The funds will be used to extend the system of fee exemptions (the *no tax area*) to students coming from households with an income up to EUR 20 000 (currently EUR 13 000), bringing the number of potential beneficiaries to 500 000 from the current 300 000. The state fund for student grants *(Fondo integrativo statale)* was increased by EUR 40 million, to be disbursed with a particular attention to eligible students who currently do not receive a grant due to lack of funds.

While a tertiary degree represents an advantage on the labour market, transition into employment remains difficult. The employment rate of recent tertiary graduates[185] has been steadily recovering over the past 5 years, reaching 64.9% in 2019, up 8 pps compared to 2014. While it is considerably higher than the employment rates for VET and general upper school

[184] 2019 Budget law.

[185] People aged 20-34 who left education 1-3 years before the reference year.

graduates[186], it remains well below the EU average of 85%. Low demand from a productive sector characterised by small and medium-sized firms is a factor in graduates' poor employment prospects.

An increasing number of university graduates are leaving the country. Of the 157 000 Italians who moved abroad in 2018, 27 000 had a tertiary degree, an increase of 6% on the previous year. In the same year, 13 000 Italian graduates moved back from abroad, resulting in a net loss of highly qualified people of 13 000 in 2018, and 101 000 over the past 10 years (Istat 2019). This appears to indicate that the system of fiscal incentives introduced in 2017 to encourage the return of highly qualified professionals is not succeeding in stemming the outflow of highly qualified people.

The government has allocated additional funding to recruit academic staff in state universities. EUR 96.5 million a year was allocated to recruit 1 600 assistant professors (*ricercatore universitario di tipo* B) from 2021, and EUR 15 million to promote 1 000 assistant professors to a tenured position (*professore di seconda fascia*) from 2022. The funds will be distributed among universities based on their size and, to a lesser extent, the quality of their research. After several postponements, the government has launched the fourth round of evaluation of the research results of universities and public research institutes (*Valutazione della Qualità dei prodotti della Ricerca, VQR*), whose results influence almost a third of the allocation of public research funding. The new exercise covers 2015-2019 and will take at least a year to complete, meaning that until 2021 funding allocation to universities and research centres will still be based on the assessment results for 2011-2014.

The budget law for 2020 provides for the establishment of a new public agency to promote and fund strategic research activities. The new agency (*ANR-Agenzia Nazionale per la Ricerca*) may help increase the effectiveness of public expenditure in research and development, but does not represent an increase in Italy's overall investment in research, which stood at 1.4% of GDP in 2018 (EU average 2.2%)[187]. The agency's budget was set by the previous Education Minister at EUR 25 million for 2020, EUR 200 million for 2021, and EUR 300 million for 2022. However, almost half the new agency's budget has been subsequently diverted to funding the recruitment of new academic staff. With Ministerial Decree of 13 May 2020, n. 81, the Minister of University and Research has allocated 60 million euro as co-financement to Universities for the enhancement of technological infrastructures, digital education and student services.

8. Promoting adult learning

A national strategic plan for adult competences was announced for 2020 to tackle the high rate of low-skilled people in Italy. The plan aims to improve coordination between the different players and processes involved in lifelong learning, to jointly establish national training strategies for 2020-2022 to ensure integration and return to the labour market. Italy ranks 25th of 28 EU Member States in the European Commission Digital Economy and Society Index 2020. The level of digital skills differs significantly among those employed in different economic activities. Digital skills are more widespread in the services sector, followed by public administration, and lowest in the industrial and primary sectors. This might hamper innovation and inclusion in society and the labour market.

The National repository for regional vocational qualifications has been updated following an agreement in the State-Regions Conference[188]. Covering qualifications from general education, higher education and VET, the framework fosters validation, permeability and guidance practices.

[186] In 2019, recent Italian VET and upper secondary school graduates had the lowest employment rates in the EU, at 56.6% and 38.3% (EU averages 79.1% and 62.8%) (Eurostat).

[187] Eurostat : [t2020_20].

Italy has adopted its first national strategy for digital skills, targeting the population at large. In 2019, 41.5% of Italians had at least basic digital skills (below the EU average of 58.3%) and only 22% had more advanced (i.e. above basic) digital skills (EU average 33.3%). The new strategy was adopted in July 2020 in the framework of the Digital Republic initiative[189]. It covers education, the active workforce, ICT specialist skills and digital skills for active citizenship and democratic participation,under the co-ordination of the relevant ministries. The availability of distance learning courses is a positive development: there are 5 AGORÀ classrooms (online lectures) authorised by the Regional School Offices of Liguria, Apulia and Sicily. The Italian Ministry of Education is supporting experimentation in the Provincial Adult Education Centres with the PIAAC self-assessment tool developed by the OECD.

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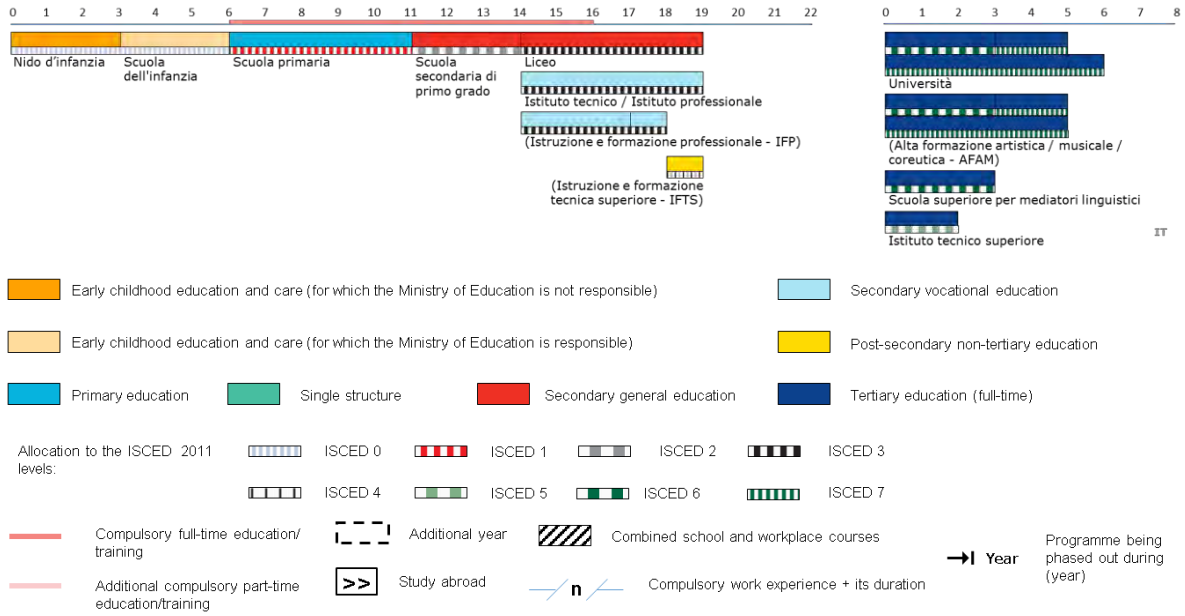
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Grazia ROMANI
Grazia.ROMANI@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

European Commission

LATVIA

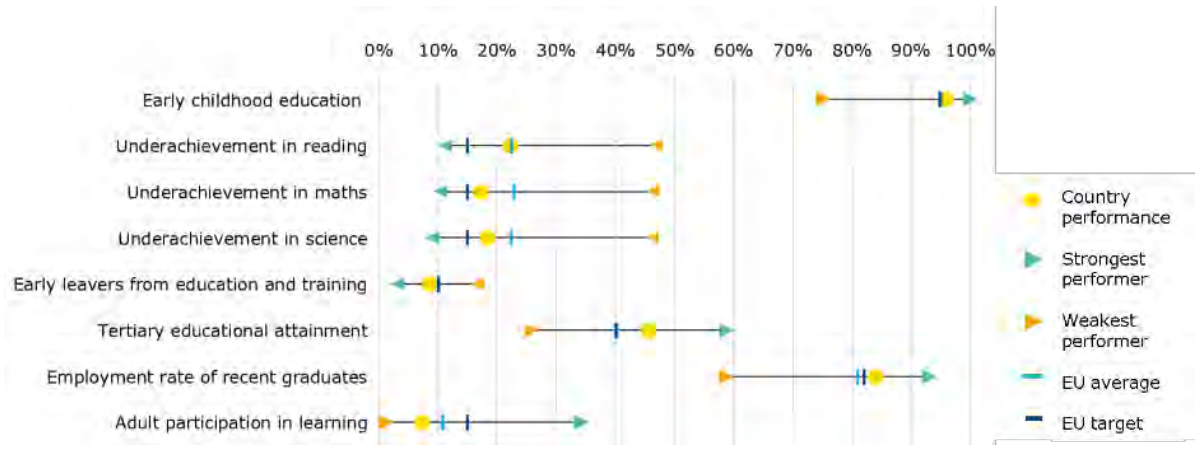
1. Key indicators

Figure 16 – Key indicators overview

			Latvia		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			14.3%	8.7%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			30.5%	45.7%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			91.7%	96.0% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		17.6%	22.4% [18]	19.3%	22.5% [18]
	Maths		22.6%	17.3% [18]	22.2%	22.9% [18]
	Science		14.7%	18.5% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		69.7%	84.1%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		5.6%	7.4%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	8.1% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	5.2% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		6.7%	5.8% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€5 366 [12]	€4 467 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€5 684 [12]	€5 394 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€8 072 [d, 12]	€5 786 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		14.3%	8.8%	12.6%	8.9%
	Foreign-born		: [u]	: [u]	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		30.9%	45.5%	32.0%	41.3%
	Foreign-born		: [u]	51.6% [u]	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		57.7%	70.4%	72.2%	75.9%
	ISCED 5-8		80.4%	96.6%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs, u = low reliability, : = not available, 12 = 2012, 16 = 2016, 17 = 2017, 18=2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Latvia is strongly committed to promoting digital education.
- Reforms at all levels of education should bring improvements in quality and efficiency.
- Tertiary educational attainment is high and offers a significant employability advantage.
- Latvian schools and pupils were able to adapt quickly and effectively to the COVID-19-enforced switch to distance learning.

3. A focus on digital education

Digital education and skills are a key element of Latvia's overall education policy. The Education Development Guidelines for 2014-2020 support the development of digital skills[190] in schools and promote the use of digital learning tools and innovative digital learning content at both primary and secondary level. The indicated deadline for implementing these Guidelines is the second half of 2020, but no official evaluation is available so far[191]. The new competence-based curriculum identifies digital skills as one of six transversal competences to be taught at all school levels. For years 1-3 the new curriculum envisages the teaching of computer science in an integrated way and sets out a recommended number of hours, while in years 4-9 it is taught as an optional separate subject. The use of PCs starts in first grade. A pilot project teaching computer science (*datorika*) in primary schools was launched in 2015, and while it is not a requirement, many schools provide it as a core subject.

At 48.3%, the proportion of teachers who report frequently or always letting students use ICT for projects or classwork has grown by 8 pps since 2013 and is slightly above the EU-22 average of 46.9%. However, comparison with neighbouring countries' experience suggests that Latvian teachers do not use the full spectrum of opportunities offered by digital technologies. The share of teachers who have received training in the use of online collaborative tools was just above 42% in 2015 (compared to 60% in Estonia)[192]. Teaching materials in Latvia are less interactive and more in line with a frontal teaching approach. A comprehensive vision of how to help teachers work in a digitalised learning environment needs to be developed in order to avoid a fragmented approach which might not promote pupil development but may contribute to attention deficit (Daniela, Rubene and Goba 2018).

The share of digitally supportive schools[193] is significantly above the EU average, but a lack of adequate technology hinders many schools' capacity. While internet access is less of an issue in Latvian schools (8.7% of school leaders report insufficient internet access; EU-22 23.8%), a significant proportion of school leaders (41%) reports a shortage of or inadequate digital technology in their schools (EU-22 27%)[194]. This may explain why the share of pupils who use a PC at school on a weekly basis in Latvia is relatively low (40%; EU average 52% in lower secondary), while the share of students who use their own smartphones is significantly higher, particularly among upper secondary students (80% v 53%) (European Commission 2019). Students' confidence in their digital competence is broadly in line with the EU average.

[190] Defined as the ability of pupils to `use digital technology responsibly in everyday life to acquire, use and create knowledge, and to solve tasks and problems, to share and use their own and others' content, to master their digital identities effectively, to communicate and collaborate effectively and securely with others in the digital environment; critically and constructively assess the role of technology and media in society´.

[191] A 2017 Ministry of Education and Science implementation report on the Education Development Guidelines 2014-2020 covers digital education but provides neither quantitative indicators nor achieved results.

[192] Online 4 EDU (2015) O1-A2: Results - Beneficiaries' Skills Gap and Training Needs Analysis, https://www.online4edu.eu/index.cfm/secid.181

[193] Schools that have strategies for using digital technology in teaching and learning and that strongly promote teachers' professional development.

[194] OECD, TALIS 2018.

Latvian teachers feel generally more confident in their ability to use ICT than their EU peers. In 2018, 48% of lower secondary teachers felt well or very well prepared to use ICT for teaching, compared to 37.5% in the EU-22. ICT training is a strong component of both initial education and in-service training: 79.3% of recently qualified teachers[195] received ICT training as part of their formal teacher training, (EU average 52.9%). This variation may reflect the increased emphasis on digital education of recent years and the demographic profile of Latvian teachers[196]. A wide range of digital education-related courses is offered by continuing professional development (CPD) institutes and training agencies, and over two-thirds of Latvian teachers received ICT training as part of their CPD in 2018, the highest proportion in the EU[197]. However, 22.6% of teachers report a strong need for further ICT training, significantly more than the EU-22 average of 16.1% (OECD, TALIS 2018).

The switch to distance learning caused by the COVID-19 emergency was comparatively smooth and effective, but efforts are needed to ensure equal access for all students. When on-site lessons were suspended at the end of March 2020, 93% of families and education establishments were technically ready to pursue online education: only 3% of students had no electronic device[198]. The government allocated EUR 200 000 to remedy the situation, while mobile operators supplied students with 5 000 tablets with internet access. According to a survey by the Ministry of Education and Science (MoES), a majority of teachers feel that they managed well (71%) or very well (15%) in providing distance learning. More than half of parents felt confident that learning objectives would be met. Students' feelings about online classes were mostly positive (49%) or neutral (40%) (Edurio, MoES 2020).

4. Investing in education and training

Latvia invests comparatively heavily in education. Government expenditure on education grew by 5.3% in real terms in 2018, and remains well above the EU average both as a share of GDP (5.8% v 4.6%) and as a proportion of total government expenditure (15.1% v 9.9%). The largest share of the education budget goes to primary and pre-primary education (40.3% v EU 34.1%) while investment in secondary and tertiary education is well below the EU average (24% and 13.1% v 37.8% and 16.4%, respectively). Expenditure per student expressed in purchasing power standards is comparatively high relative to the country's GDP per capita but remains below the EU average at all levels of education, reflecting teachers' low salaries.

Maintenance of a large and inefficient school network weighs heavily on resource allocation. In 2018, a comparatively high share of Latvia's education budget was spent on intermediate consumption (20%) and on gross capital formation (15%), well above the EU averages of 13% and 7%, while compensation of employees only accounted for 58% of education expenditure, compared to 65% in the EU (Fig. 3).

Government efforts to reduce the number of schools and increase class sizes continue. The Education Law was amended in 2019, enabling the government to set minimum requirements for school and class sizes, and negotiations with municipalities on the reorganisation of the school network are ongoing. Action in this area could help to improve learning outcomes and narrow educational gaps between urban and rural areas by providing competitive remuneration for teachers and quality education for every child, as evidence shows that larger schools and better remunerated teachers achieve better results (Krasnopjorovs, 2019, OECD 2019). The

195 Teachers who completed their formal education in the 5 years preceding the survey.

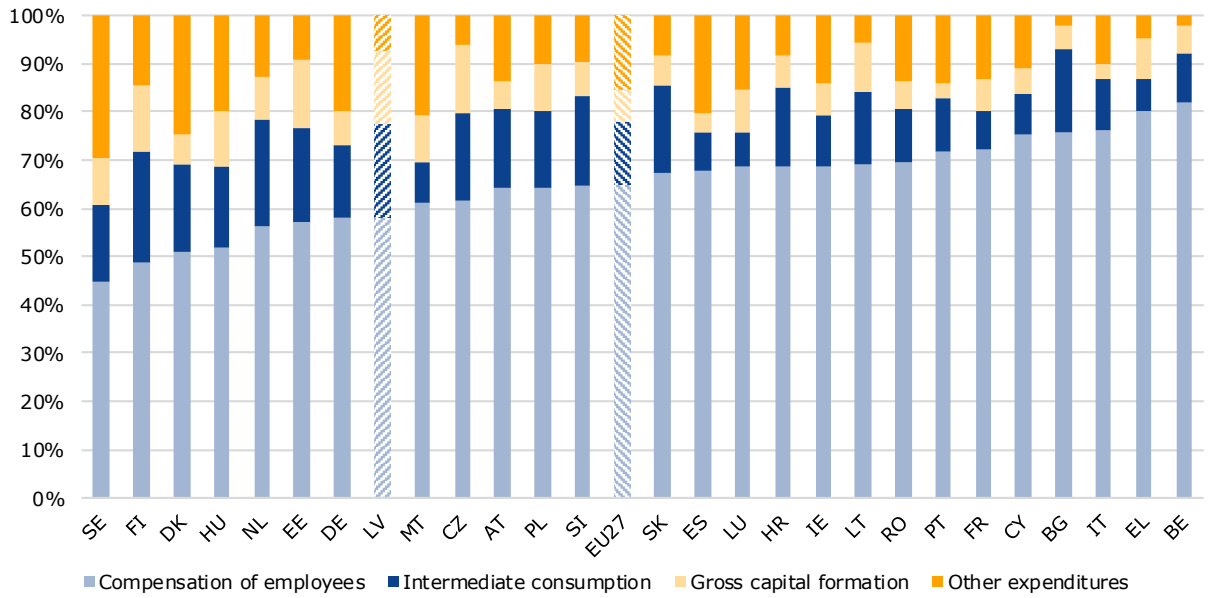
196 In 2017 almost half of all Latvian schoolteachers were 50 or older, and only 16% were under 40 (European Commission 2019ETM).

197 It should be noted that teacher-specific digital competences are a criterion in the evaluation of teachers' professional activities.

198 Source: MoES.

administrative and territorial reform[199] currently underway could have a positive impact on streamlining the school network.

Figure 3 - General government expenditure in education by category, 2018



Source: Eurostat, COFOG: [gov_10a_exp].

5. Modernising early childhood and school education

Participation in early childhood education (ECE) is almost universal for 4-6 year-olds, but enrolment of younger children is lower. 97.4% of 5-6 year-olds were enrolled in ECE in 2018, slightly more than the EU average of 96.4%. The figure drops to 27.4% for children below the age of 3 (EU average 34.7%), even though Latvia guarantees a free place in ECE from the age of 18 months to every child whose parents so wish[200].

The early school leaving rate is well below the EU average but rises significantly outside cities. In 2019, the percentage of early leavers from education and training (ESL) in the 18-24 age group was 8.7%, a slight increase (0.4 pp) over 2018, but still well below the EU average of 10.2%. ESL is considerably higher in rural areas (11%) and outside bigger cities (13%), echoing geographical disparities in learning outcomes. The ESL rate decreased for boys (10.5%, down from 11.4% in 2018) but increased for girls (6.8% v 5%) leading to a significant reduction in the gender gap.

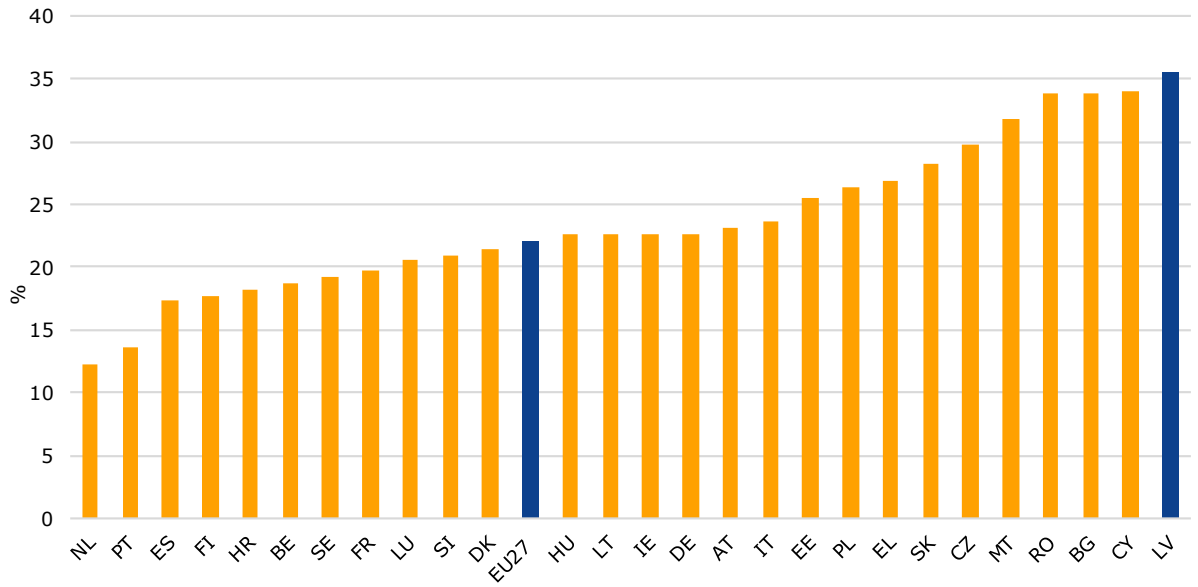
Latvia performs comparatively well in terms of basic skills proficiency, but the extent of bullying is a cause for concern. In 2018, 15 year-olds' performance as measured by PISA was broadly stable in science but worsened in reading compared to 2015, though still better than the level in 2000, while performance in maths improved (OECD PISA, 2019). The proportion of low achievers in all three domains is lower than the EU average (9.2% v 12.6%). On a less positive note, at 35.5% the proportion of students who reported being bullied at least a few times a month is the highest in the EU, and has grown by almost 5 pps since PISA 2015[201] . More than one in ten (11%) of 15-year-olds said they were frequently bullied, 10% that they were regularly threatened by other students and 12% said they were physically assaulted 'at least a few times each month'. Boys tend to be bullied more than girls, as do low-performing and disadvantaged students.

[199] A major administrative territorial reform aims to reduce the number of municipalities from 119 to fewer than 40. The reform aims to increase municipalities' capacity to foster development and provide better-quality services, including education.

[200] Education Law, Section 17.

[201] The increase may be partly explained by the addition of social media as a potential platform for bullying in the 2018 questionnaire.

Figure 4 – Proportion of students reporting that they have faced bullying at least a few times in a month, 2018



Source: OECD (2019), PISA 2018.

The education system is broadly equitable, but unequal opportunities in access to quality education persist. According to PISA 2018, students' socioeconomic background exerts a comparatively limited influence on learning performance. The difference in PISA reading performance between the most advantaged and the most disadvantaged students was 65 score points, significantly lower than the EU average of 97. Girls outperformed boys in reading (by 33 score points) and to a lesser extent in science (8 points), but were outperformed by boys in maths (7 points), in line with the EU average. PISA confirms that access to quality education remains dependent on place of residence: larger urban schools continued to perform much better than smaller rural ones, with a difference of 52 score points in reading, equivalent to over a year of schooling.

The new competence-based curriculum for general education is being phased in. The new curriculum will be implemented in grades 1, 4, 7 and 10 from September 2020. For grades 1-7 (basic school), the curriculum covers the following subjects: languages (English, German and French), social and civic studies, understanding of culture and art of self-expression, science, maths, technologies, health and sport. In upper secondary education (grades 10-12) the curriculum reduces the number of subjects and allows students to dedicate 30% of school time to specialised in-depth learning of selected subjects. Implementation of the new curriculum started at pre-school level in 2019/2020 and should be completed in the upper grades in 2022/2023. In order to support teachers in its implementation, a free self-study e-course has been made available to all teachers with European Social Fund (ESF) support[202]. In addition, the National Education Centre (VISC) launched a campaign to inform parents about the most significant changes at all school levels and of what is expected of them in terms of parental support and cooperation with the school.

Teacher shortages are a focus of attention for school principals and some municipalities. Several school principals have devised temporary solutions to fill vacancies: persuading retired teachers to work, asking teachers specialising in different subjects to cover vacancies on top of their normal subjects, and providing subjects in blocks (e.g. no maths in September, but intensive maths every day in November). Municipalities are also trying to address teacher shortages, for instance by offering bonuses for teachers who agree to relocate from other regions, or providing municipal apartments at a discount price. The government has also taken steps to address the issue. Measures discussed include the development of a fast-track teacher training programme

[202] Project *Skola2030*.

(prioritising science, technology, engineering and mathematics (STEM)) for university graduates; a tool for more accurate identification of teacher vacancies; the possibility to validate prior experience in education as a pathway into teaching; and modules for teachers to learn how to teach other subjects. A new teacher training programme, 'Teaching force', aims to attract professionals from other fields (see Box 1). While these measures may attract new teachers, long-term success will depend on the system's capacity to retain teachers by increasing the attractiveness of the profession.

Box 1: `Teaching force´: fast-tracking professionals into teaching

The MoES has launched 'Teaching force' (*Mācītspēks*), a project designed to attract professionals from various fields and train them as teachers, with support from the ESF. The project is jointly implemented by the University of Latvia (Riga), the University of Liepaja and the University of Daugavpils, ensuring a wide territorial coverage. The project envisages the entry of 100 new, specially trained teachers into schools every year for at least 3 years, starting in 2020. Apart from the three universities, the MoES has also partnered with the Foundation 'Mission Possible'. The course involves 4 days of teaching and 1 day of studying a week. Students will be entitled to a monthly grant of EUR 200 during the period of study and to a salary supplement of EUR 120 during their first year of work after graduation. A publicity campaign was developed to promote the programme in spring 2020.

'Teaching force' is based on the second level higher professional education programme for acquiring teacher qualifications. This is one of the study programmes of the new teacher education system in the ESF project 'Innovative, research-based study programmes of the University of Latvia in the field of education – Education, pedagogy and sports' (No. 8.2.1.0/18/I/004).

Selection of participants takes place in three rounds: in round 1, candidates are invited to describe their motivation, analyse their previous achievements, realise what they want to achieve in the programme, and where and with whom they would prefer to work. In round 2, they are invited to lead a 7-minute session for other candidates, work with them to solve a school-related problem situation, and solve a problem situation in pairs. The candidates need to prepare their sessions at home and, among other things, show their ability to work in teams. During round 3, in the face-to-face conversation with the evaluators, candidates have the opportunity to discuss their reasons for participating in the programme and talk thoroughly through any questions from previous rounds.

6. Modernising vocational education and training

The employment outcomes of recent VET graduates in Latvia are rather poor, particularly when compared to the employment situation of young adults in general. In 2019, the employment premium of recent graduates from VET, compared to the average employment rate of young adults, was negative and one of the worst in the EU (recent VET graduates had a 15.5 pps lower employment than all young adults, a situation worse only in EL)[203]. On average in the EU, the employment premium of recent VET graduates is positive, i.e. they have an employment rate 1.7 pps higher than young adults in general[204]. The number of students enrolled in VET declined between 2013 and 2016 but has now stabilised, and marginally increased in 2018 close to 23 700[205]. 38.8% of learners were enrolled in upper secondary VET out of total learners in upper secondary education (EU 48.4%).

Amendments to the VET law have been under public consultation since January 2020. They introduce partial awards (as opposed to full qualifications only) and flexible pathways for acquiring qualifications through lifelong learning (Cedefop ReferNet, 2020). VET schools are being equipped with modern technologies. Since the merging of smaller schools into bigger VET centres

[203] Source: Eurostat, EU-LFS, 2019

[204] *Ibid.*

[205] Source: Eurostat, UOE, 2018

in the past decade, their modernisation has been a priority. The current strategy for upgrading school equipment is focused on 17 'priority education programme groups' and covers high-speed internet and software for training. Digital literacy courses are offered to VET teachers though the 2016-2022 national ESF project[206] (Daija et al, 2019).

The covid-19 pandemic had an impact on VET in Latvia[207]**.** VET exams were held in two parts: the theoretical part will be taken remotely and the practical part will be on-site in small groups, following strict health restrictions. VET institutions can reduce the length of internships after assessing the situation and the specifics of the study programme. In vocational secondary and 3-year programmes, internships can be reduced by 320 hours maximum, in vocational basic education programmes – by 240 hours maximum.

7. Modernising higher education

The share of young adults with tertiary education is high and growing, but the gender gap in tertiary attainment remains significant. 45.7% of Latvian 30-34 year-olds had a tertiary qualification in 2019, up from 42.7% in 2018 and well above the EU average of 40.3%. The increase was more marked for men (from 30.6% to 35%) than for women (from 55.2% to 57%). The gender gap is thus lower than in 2018, but remains twice the EU average (22 pps v 10.5 pps). STEM graduates were 20% of all graduates in 2018, well below the EU average of 25.4%. The proportion of graduates in natural sciences, mathematics and statistics was the lowest in the EU (2.7% v 6.4%).

Latvian graduates have the highest employment rate in the EU, pointing to significant returns to higher education. The employment rate of recent tertiary graduates in the 20-34 age group reached 96.6% 2019 (up from 91.3% in 2018) and is significantly higher than the EU average of 85%. This is in stark contrast to the employment rate of VET graduates (ISCED 3-4), at 65.6% one of the lowest in the EU.

Latvia's graduate tracking system is in its early stages of implementation. The register of students and graduates was launched in 2017 and gathers individual data about graduates' employment status, field of work and salary; education institution, study programme and degree related information; and demographic characteristics. The register will eventually form the basis for higher education graduate outcome and study quality monitoring. It will also inform the general public and potential students, and provide objective information to policymakers and experts for analysis of employment and career development over time.

A reform of the governance of higher education institutions is under way and could increase their strategic capacity and academic competitiveness. The MoES has submitted to parliament proposals to increase the international competitiveness of the HE sector[208]. The proposals will be incorporated into laws in the course of 2020 and implemented gradually, first in universities (2020–2022) and then in colleges (2022–2023). The reform is expected to deliver systemic results by 2025-2027, which, in turn, will allow a new HE development plan to be prepared from 2028 onwards. The areas targeted by the reform are:

- Governance: separation of academic and strategic decision-making by introducing executive boards tasked with ensuring strategic management while guaranteeing the autonomy, openness and transparency of HEIs.
- Funding: state funding will be allocated according to performance outcomes, priorities set by the state and the goals of the individual HEI. The boards will be responsible for allocating co-financing for project funding obtained from external sources. This will incentivise HEI management to attract external funding more effectively, diversifying

206 Project `Effective management of vocational education institutions and the development of staff competences´https://visc.gov.lv/visc/projekti/esf_853.shtml

207 Implications of the novel coronavirus (covid-19) on education and training: state-of-play in Member States. Croatian Presidency of the Council of the European Union. Version 21, 2020-05-14.

208 `On changing the internal governance model of higher education institutions´ conceptual report (MoES).

funding sources and ensuring strategic long-term development regardless of annual fluctuations in the state budget.

- Human resources: a unified career model for academic teaching and research staff is to be developed, aiming to increase the competitiveness of higher education and science and ensure the development of new talents.

Box 2: Developing effective governance at Riga Technical University (RTU) with ESF support

The goal of the project is to improve the quality of content of study programmes. The project also aims to ensure effective governance processes and to promote management's skills and competences also through digital education. This includes:

- Creating audiovisual teaching tools in a virtual learning environment. Several bachelor study courses will be digitised. Part-time and further education students spend most of their time studying outside the university, and digitising these courses can significantly improve the learning process.
- Proposing digital solutions. The aim is to reflect on the level of digitalisation of RTU and to show how it is changing. Students, faculty members and staff will calculate their digital footprint with an ad hoc calculator. Development of an e-solution for academic integrity in cooperation with Rīga Stradiņš University and the University of Latvia and other higher education institutions. Actions include the development of e-learning materials and tools for interdisciplinary collaboration on academic integrity for staff and students, and a set of tools for interdisciplinary collaboration on academic integrity.

The total financing of the project is EUR 3 289 200 of which EUR 2 795 820 from the ESF, and EUR 493 380 from the state budget.

Duration of the project: 01/11/2018 – 31/10/2022.

Website: https://www.rtu.lv/lv/universitate/masu-medijiem/zinas/atvert/rtu-nodrosinas-labaku-parvaldibu-un-uzlabos-personala-kompetences?highlight=8+2+3+0+18+012

8. Promoting adult learning

Latvia is working to improve adult participation in learning, which remains significantly below the EU average. In 2019[209] the adult participation rate in education and training was 7.4%, compared to 10.8% in the EU. Between 2016 and 2019, Latvia made continuous progress in addressing identified challenges. A better and more effective coordination mechanism as well as a more targeted approach tailored to the needs of employers and learners were developed by adult learning policies in 2017-2018. However, current policies failed to meet the educational needs of many vulnerable adults (Maslo, I. 2017). Thus, the challenge remains to deliver high-quality adult learning to all, especially vulnerable adults. Further efforts are needed to incentivize employers and individuals to invest in adult learning, while funding could be allocated more equitably across regions.

There are a number of digital education opportunities for adults, formal and non-formal (e.g. job-related). Since 2014, the development of digital skills in formal and non-formal learning at all education levels was included in the Education Development Guidelines for 2014-2020[210]. According to the State Education Information System in 2019/2020, 2.13% of students took the opportunity to gain a formal primary or secondary general education through distance learning[211]. Adults can also receive a vocational basic education with pedagogical correction in several education institutions, including in the technological field.

[209] Eurostat, EU-LFS, 2019

[210] Legislation (2014). Guidelines for the Development of Education 2014 - 2020. Available at: https://likumi.lv/doc.php?id=266406

[211] State Education Information System, 2019

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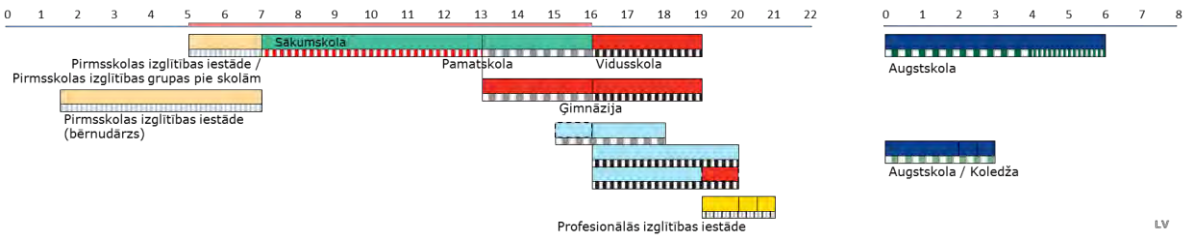
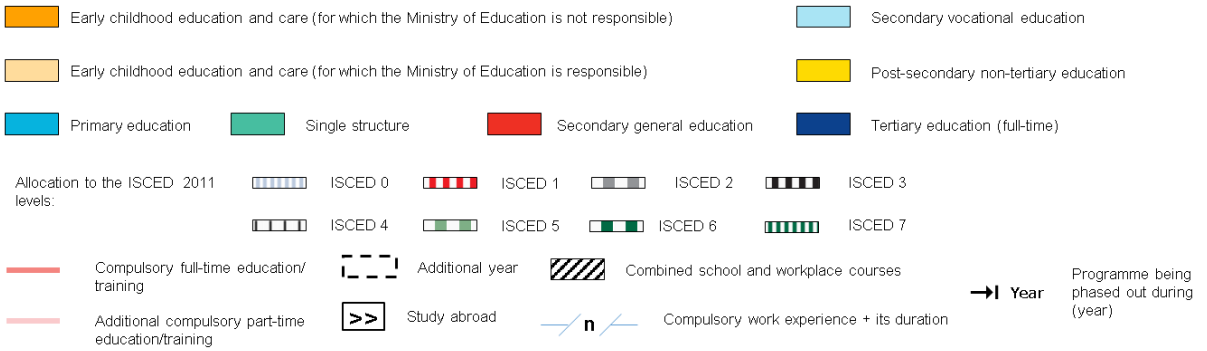
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system





Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Grazia ROMANI
Grazia.ROMANI@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

LITHUANIA

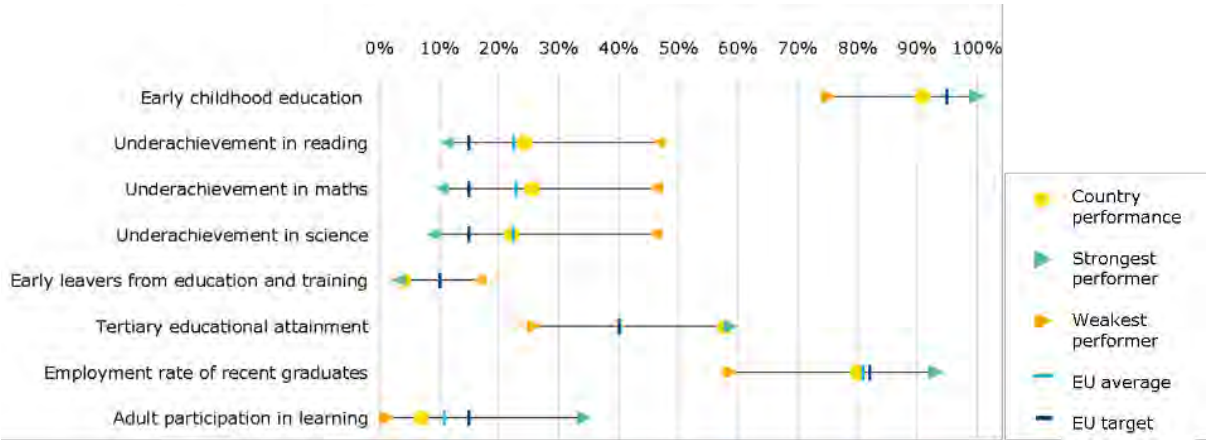
1. Key indicators

Figure 17 – Key indicators overview

			Lithuania		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			8.7%	4.0%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			40.4%	57.8%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			84.3%	91.0% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		24.4%	24.4% [18]	19.3%	22.5% [18]
	Maths		26.4%	25.6% [18]	22.2%	22.9% [18]
	Science		17.0%	22.2% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		73.0%	80.1%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		4.6%	7.0%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	9.5% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	7.0% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		7.2%	4.6% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€3 499 [12]	€4 252 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€3 968 [12]	€4 124 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€6 542 [12]	€5 502 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		8.6%	4.0%	12.6%	8.9%
	Foreign-born		: [u]	:	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		40.0%	57.9%	32.0%	41.3%
	Foreign-born		: [u]	54.3% [u]	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		57.8%	68.1%	72.2%	75.9%
	ISCED 5-8		83.9%	87.6%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs; u = low reliability; : = not available; 12 = 2012, 16 = 2016, 17 = 2017, 18=2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Steps have been taken to foster digital competences from early ages. More effective introduction of ICT into teaching practices is possible if teachers are provided with more professional learning opportunities.
- The COVID-19 outbreak can have long-term consequences for existing inequalities in student outcomes and participation rates.
- Some progress has been made on reorganising the school network, but a better allocation of resources is held back by a lack of a shared understanding of the aims of the reorganisation.
- Quality and labour market relevance of vocational education are poor, lowering participation and employment rates.

3. A focus on digital education

A relatively high share of young people possess above basic digital skills. In Lithuania, 71% of individuals aged 16-19 reported in 2019 that they have above basic digital skills (EU-27 57%). Older age groups, however, report significantly lower shares, in line with EU averages[212]. Pupils in primary and lower secondary schools also report higher confidence in their digital competences, as defined in the DigComp framework[213] compared to the European average (European Commission, 2019a). Compared to other EU countries, a relatively high share of lower secondary teachers (61.8% v EU 46.1%) report that they let students use ICT for projects or class work (OECD, 2019), which may help them increase their confidence but can have a negative impact on student achievement (Colmi, 2017). Ongoing curriculum reform aims to improve digital competences also at primary level – where they have not been previously addressed – update content and strengthen particular areas such as computer science, which will be taught beginning at primary level (see Box 1). This is a good basis for further fostering advanced digital competences needed in the labour market and in society, provided it is matched by effective classroom implementation.

Box 1: Teaching computer science at primary level

In 2018, a European Social Fund project was launched to test whether Lithuanian primary schools could integrate computer science into their curriculum. The purpose is to provide recommendations for the integration of computer science at primary level. About 100 schools were selected for this 4-year project, which covers the development of digital content, algorithms and programming, data and information, problem solving, virtual communication and security. Teachers have been given about 120 hours of training. The purchase of ICT equipment, such as tablets and education games, has also been announced. Public events have been organised in local municipalities to discuss the importance of computer science and to share information with stakeholders.

https://informatika.ugdome.lt/lt/apie/

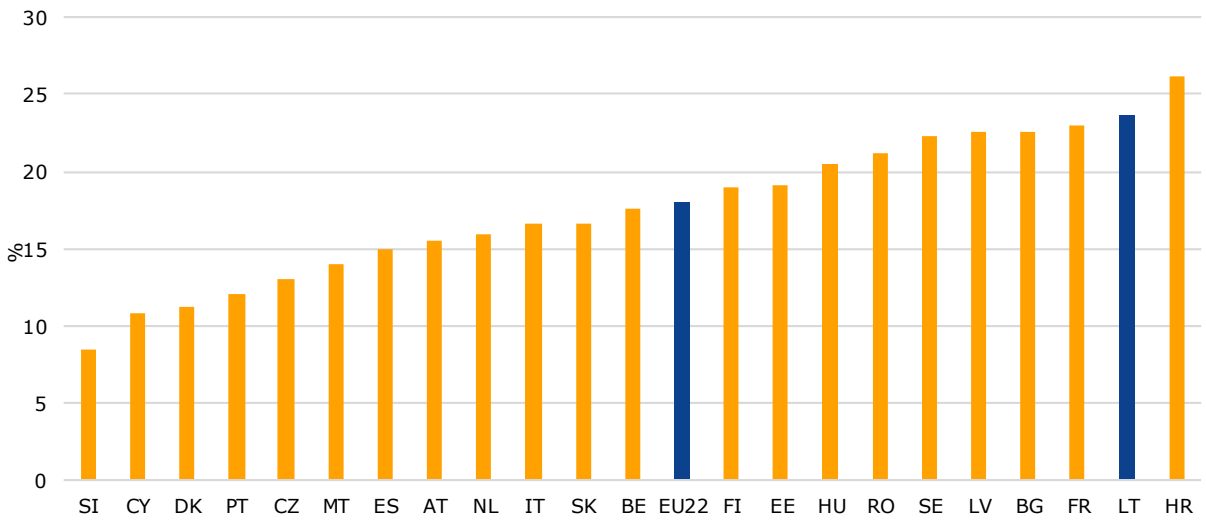
Despite substantial investments from EU funds, a lack of high-quality digital infrastructure remains an obstacle for digital education. Lithuanian schools are less highly equipped and connected than the EU-28 average, particularly at lower secondary level where only 39% of schools have a high number of digital tools per number of students and a high broadband speed (EU-28 53%). Almost a third of school principals (29.8%) report a shortage and inadequacy of digital technology that hinders their school's capacity to provide quality instruction (EU: 27.6%) (OECD, 2019a). A shortage of high-quality digital equipment and a lack of policies to improve digital learning resources (European Commission/EACEA/Eurydice, 2019b) may hold back universal use of ICT in teaching practices.

[212] LT: 38% v EU-27: 36% for 25-54; LT: 9% v EU-27 :12% for 55-74.

[213] https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework

Supporting and better preparing teachers is key to making the adoption of ICT beneficial for student learning. Research shows that student achievement does not benefit from simply increasing ICT availability and improving infrastructure. Instead, the effectiveness of ICT at school depends on the actual practices that teachers develop and on their ability to integrate them into teaching (Bulman et al., 2016; Comi, 2017). There is a need to ensure that teachers have the appropriate competences to avoid suboptimal use of digital resources, which may have a negative impact on learning outcomes, for instance by creating a distraction for pupils (European Commission/EACEA/Eurydice, 2019b). More than half of Lithuanian lower secondary teachers (56.5% v 37.5% at EU level in 2017) perceive themselves as well prepared for the use of ICT in teaching (OECD, 2019a). However, of Lithuanian lower secondary teachers, 23.4% report a high need of professional development in ICT skills for teaching, compared to 18% at EU level (Figure 3). Furthermore, according to school heads, almost all students are enrolled in schools where teachers are provided with enough incentives to integrate digital devices into their teaching (Reimers and Schleicher, 2020). This evidence suggests that additional efforts are necessary to ensure that schools give teachers access to sufficient and relevant[214] continuing professional development activities to meet the current challenges (European Commission, 2019b) providing them with guidance on how to effectively integrate computer-based teaching practices (Jevsikova, 2018). This is particularly important in the context of the current curriculum reform.

Figure 3 – Teachers reporting a high level of need for professional development in ICT skills for teaching, TALIS 2018



Source: OECD (2019a).

The COVID-19 crisis has put a strain on the education and training system. Initial efforts focused on ensuring that all schools and teachers were able to provide distance learning by using the existing platforms and sharing best practices. ICT coordinators were designated in each school to help teachers and students use the technology. During the lockdown, weekly video conferences on the use of IT platforms for teaching and consultations on distance learning were organised, also at tertiary level. On the initiative of the national Lithuanian television broadcaster and the Ministry of Education and of Culture, the programme `*LRT pamokėlės*´ was broadcast to pupils at pre- and primary levels. The project involved numerous partners, including the Lithuanian Subject Teachers' Association. To help disadvantaged pupils having access to high-quality distance learning, 41 728 digital devices (36 100 tablets and 2 053 laptops[215]) were bought, and teacher training to enhance digital skills has been provided. Primary pupils were allowed to return to schools at the end of May, but the final decision was left to municipalities and schools. Only 10% of schools chose to organise some activities at school from that date. The main challenges[216] of distance learning according to

[214] European Commission (2019a) shows that less than 20% of school students have teachers reporting that they spent more than 6 days on ICT-related professional development activities in the past 2 years (2017-2018), compared to about half of students across the EU.

[215] Information provided by the Ministry of Education, Science and Sport in September 2020.

the pupils have been a higher workload, insufficient guidance on how to arrange educational activities themselves, and the use of uncommon platforms by teachers, which has made learning more difficult (MESS, 2020). The shift to distance learning could be a further opportunity for all school players, particularly teachers, to test different digital learning solutions and understand how technology can be used to foster student learning, and to support them in doing so.

4. Investing in education and training

Spending on education is represents a relatively high share of total general government expenditure. General government expenditure on education as a proportion of GDP in 2018 was at the EU average (4.6%), and above it as a proportion of total general government expenditure (13.4%; EU-27 9.9%), but on a downward trend (from 14.5% in 2015). Public spending remained stable (-0.1%) between 2017 and 2018, with a significant increase of 5.6% in tertiary education balanced by a decrease at secondary level. This may result in better allocation of resources across education levels, since they are currently more concentrated on secondary education (European Commission, 2019b). Teachers' salaries represent 69% of education expenditure, but this share is expected to increase as the government has been introducing salary increases across all education levels since 2018 to foster the attractiveness of the profession[217]. This may require further steps towards higher efficiency in the education system to avoid expenditure increases. To boost economic recovery, government has launched a long-term investment plan with focus on human capital, innovation and digital economy and business[218].

Effective reorganisation of the education network can help better address territorial disparities. One of the main objectives of the structural reform programme is the optimisation of education networks to face the challenges of demographic change. According to the latest results of national school rankings[219], schools with a lower expenditure per pupil, which are located in urban areas, perform better than those in rural areas with higher expenditure per pupil. This confirms that there is room to improve efficiency and quality. As a result of the measures taken in 2018 (European Commission, 2019b), the number of schools with up to 120 pupils decreased by almost a quarter in 2019 compared to 2016-2017, and further decreases are anticipated in 2020 for vocational schools (from 61 to 55). Municipalities, which are in charge of the reorganisation and enjoy great autonomy in allocating resources, remain reluctant to close schools because of the social impact on rural communities. There is a lack of shared understanding of the objectives of the reorganisation between local and central levels which is holding back the development of a long-term strategy that tackles the challenges of rural education and ensures the conditions for high-quality learning in rural areas (Echazarra and Radinger, 2019). To mitigate the effect of the COVID-19 crisis on the construction sector and sustain the economy, the government plans to invest in education infrastructure between 2020 and 2021. These investments are planned to cover mostly repainting, refurbishing and increased energy efficiency; a small fraction will focus on improving teaching quality and digital learning. The mandatory shift to distance learning due to the COVID-19 outbreak could show how digital devices open up significant opportunities to improve the delivery of rural education by linking teachers and pupils who are separated geographically. Little progress on university consolidation has been made (see Section 7).

5. Modernising early childhood and school education

Demand for childcare services is not being met. Participation in early childhood education by children aged 4-6 remains below the EU average (91.0% v 94.8%) in 2018. 20.8% of children below 3 attended formal childcare facilities — a rise of 5.6 pps since 2016, yet still below the Barcelona target of 33% and the EU average of 34.7%. National statistics confirm the positive trend in all counties, though a gap of about 15 pps exists between Vilnius and Tauragė counties. Access to childcare facilities remain limited for children between 0 and 5[220] as the number of places

[217] School teachers' salaries increased by 18% between 2017 and 2018 and by 10% in the past year. A further increase of 10% is anticipated from September 2020.

[218] http://finmin.lrv.lt/uploads/finmin/documents/files/DNA%20of%20the%20Lithuanian%20economy.pdf

[219] Reitingai, journal, May-December, 2020/ No 1 (13)

[220] Demand is met for children aged 6 as participation is mandatory.

and free hours is insufficient to cover the high demand, particularly for children over 3 and in urban areas (European Commission/EACEA/Eurydice, 2019a; National Statistics Office). Early childhood education is provided free for 20 hours per week. However, children spend on average 38 hours in kindergartens, and the cost of extra hours is covered by municipalities or families. Discussion with municipalities, which are in charge of approving the programme for the whole early childhood education phase, are ongoing, to lower the entry to pre-primary education (currently 6) by a year. This will also have an impact on trends in expenditure.

A quality assurance framework for early childhood education is being developed to address the challenge of uneven quality of service provision across municipalities. A system of quality assessment (external and internal) is being developed, as are methodologies for self-assessment and external evaluation of performance. Finalisation of the methodologies is planned for 2021[221]. This may also help put in place a mechanism, which is currently absent (European Commission/EACEA/Eurydice, 2019a), to collect the results of individual evaluations run at municipal level to monitor and assess the whole early childhood education system. This could ensure that high quality is provided across the whole territory, taking into account that municipalities are responsible for quality as well as for regulation and evaluation procedures.

One in five pupils fails to reach a minimum proficiency level in basic skills. The latest results of the OECD Programme for International Student Assessment (PISA) 2018 show that the proportion of underachieving pupils is above the EU average in mathematics and reading and has remained practically unchanged in these two domains since 2009. It has increased by 5.2 pps in science, and is now close to the average[222]. Lithuania's mean performance is below the average in all three subjects and has remained practically unchanged since 2009 (OECD, 2019b). Work on the new competence-based curricula is going ahead. It should be piloted in 2021 and implemented from 2022, accompanied by new formative assessment practices. The new curriculum aims to introduce new pedagogies to better address students' learning needs. It may help improve students' performance in the medium term if matched with inclusive and continuous involvement of stakeholders and strong support to teachers who will need time and resources to develop new competences (see Box 2).

Box 2: Strengthening school human resources

School staff are the key factor for an effective education system. Teachers are key to improving learning opportunities for students, and school leaders play a pivotal role in raising school quality and creating an environment in which teachers can continuously improve their competences to support student learning (OECD, 2019d). Lithuania has been working to meet the challenges facing teachers and school leaders (European Commission, 2019b) with the support of the structural reform support programme. In addition to the teacher workforce forecasting tool, work is ongoing to modernise the initial teacher education system to improve its quality, including by strengthening partnerships between university researchers and schools and upgrading universities' offer of continuing professional development. At the same time, the competence profiles of school leaders are being reviewed to better match new school needs and higher autonomy. Traditionally, school leaders had mostly administrative tasks: the 2018 reform introduced tighter competence and selection criteria for their entry and permanence in the profession, resulting in lower interest from candidates[223]. As a consequence, the Ministry set up a working group to develop a new regulation for their appointments in late 2019.

While this reflects the high commitment of the Ministry to modernising the education system, higher success will be ensured if a shared understanding of desired outcomes and of policy reforms to achieve them is developed and communicated effectively among all relevant stakeholders.

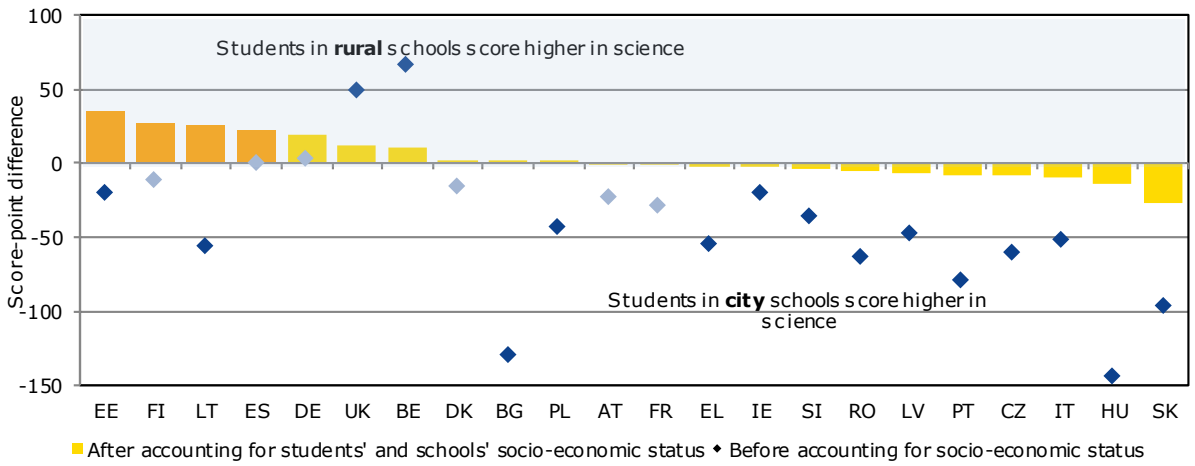
221 Information provided by the Ministry of Education, Science and Sport in February 2020.

222 See Figure 1.

223 There were 159 calls to take the position of school head in October 2019. Only 60 candidates were selected while 99 calls were not successful.

The COVID-19 outbreak may increase the risk that pupils from a disadvantaged background will lag behind. According to the latest PISA results, socio-economic background plays a significant role in determining student performance. About 40% of pupils in the bottom socio-economic quartile are underachievers in reading (EU 36.4%), compared to 11.2% in the top quartile (EU 9.5%). Moreover, although below the EU average (97 points), the gap in reading mean performance between the top and bottom quartile has increased by 5 points since 2009 (89 in 2018). Pupils in public schools and in rural areas perform worse than those in private schools (67 points) and urban areas (70 points). Echazarra and Radinger (2019) show that rural students would actually outperform students in urban areas if they, and their schools, had the same socio-economic profile, highlighting the significant role of socio-economic factors (Figure 4). PISA 2018 also shows that disadvantaged pupils are likely to be more concentrated in the same schools (OECD, 2019c), and thus less likely to be exposed to high-achieving students. Coupled with a lower share of teachers with a masters' degree in disadvantaged schools[224], this social segregation across schools and municipalities could have a potential negative effect on student performance due to the lack of `peer effects´ (Sacerdote, 2011). This also points to the need for resource allocation that ensures higher quality for all. In particular, the provision of education in rural areas would require targeted responses to compensate for challenges related to distance and size, but also socio-economic factors. Compensation measures could be necessary to mitigate the long-term effects of the COVID-19 crisis, particularly on already disadvantaged learners.

Figure 4 - The rural-urban gap in students' performance



Source: Echazarra and Radinger (2019). Notes: Results based on linear regression models on PISA 2015. Statistically significant coefficients are marked in a darker tone.

Improving school climate could boost student performance and well-being. PISA 2018 shows that the share of 15 year-olds reporting that they are victims of bullying at least a few times a month has increased by 6.2 pps since 2015, up to 22.6%. This does not seem to have any impact on school drop-out as the rate of early school leavers remains the lowest in the EU in 2019 (4%; EU 10.2%). By contrast, exposure to bullying is associated with a significant drop in reading performance by 40 PISA points (EU: 23 points). To tackle this issue and meet the target set in the 2018-2021 structural reform programme[225] to reduce the proportion of pupils subjected to bullying by 2021, several anti-bullying programmes have been implemented at pre-primary and school level since 2018 and an online platform has been launched to allow victims to get quick help. From 2018 schools have also been hiring psychologists to provide support (National Reform Programme, 2020). These actions could help improve student performance, particularly among those who are more likely to be bullied: disadvantaged (27.5% v 17.6% of advantaged) and low-achieving students (38.2% v 12.7% of high-achieving).

[224] 37.4% in disadvantaged schools v 53.8% in advantaged schools.

[225] According to national data, the proportion of pupils that did not experience bullying over two months reached 48.2% in 2019, far from the objective of 75% by 2021.

6. Modernising vocational education and training

The employment outcomes of recent VET graduates are relatively poor. The employment rate of recent VET graduates (20-34) in 2019 was 20.3 pps lower than of those with a tertiary qualification (EU:5.9 pps). Enrolment in upper secondary vocational education has continued to decline over the years; while the number grew at post-secondary non-tertiary level until 2017, a significant decline in enrolments was registered in 2018. According to the latest audit (National Audit Office, 2020), in 2018-2019 the percentage of initial VET students enrolled in apprenticeships was only around 1.9%, well below the 20% target set for 2020. With the number of pupils decreasing, that of institutions with fewer than 300 students increased. The anticipated reduction of VET institutions (see Section 4) is a good step towards higher efficiency. Due to COVID-19, final assessments of competences were not performed during the quarantine. For students who had completed less than half of the practical training, VET providers are recommended to allow them to complete the remainder of the practical training at another time, at their request.

Recent reviews of the VET system identified several challenges. PISA 2018 shows that Lithuania has one of the biggest reading performance gaps (about 103 points, equivalent to more than 2 scholastic years) between pupils in general and vocational programmes. Early leaving from VET is declining but is still much higher than from general education, although there is no clear understanding of the reasons behind school drop-out (National Audit Office, 2020; Cedefop ReferNet, 2020). An external quality assurance system is still in the process of being developed and four VET institutions did not have internal quality assurance systems. Data fragmentation is seen as a main barrier to efficient monitoring and assessment of the effectiveness of VET. This further negatively influences the quality of programmes and their relevance to labour market needs. Finally, lack of employer engagement (they are involved only in 15 out of 70 VET schools in 2018) is another important weakness (Cedefop ReferNet Lithuania, 2019; National Audit Office, 2020).

7. Modernising higher education

Measures to improve access to tertiary education have been announced. PISA 2018 shows that there is a significant gap between 15-year-olds from low (46.2%) and high (90.2%) socio-economic backgrounds in their expectations of completing tertiary education. Students from low socio-economic backgrounds tend to participate less in tertiary education and enrol in technical institutions (OECD, 2017). To increase equity and counterbalance the high share of upper secondary students who leave the country to study abroad (9.5% v 4.3% in 2018)[226], the number of university scholarships and their value at bachelor level have been increased from the 2020/2021 academic year. Such measures could also help contain the effects of the COVID-19 crisis on the most vulnerable groups.

Improving quality of tertiary programmes remains a priority. Lithuania's tertiary attainment rate (30-34) was the second highest in the EU (57.8% v 40.3%) and recent tertiary graduates had a high employment rate (87.6% v 85%) in 2019. The share of ICT graduates was around the EU average (5.3% v 3.8%) and increased (+3.5 pps) at the fastest rate in the EU in 2015-2018. The results of the first pilot of the Eurograduate survey show that only 50% of tertiary qualified people are employed in a job that matches their degree and field of qualification 5 years after graduation. Moreover, the share of those not working in the field they graduated from increases 5 years after graduation (from 7% to 17%), signalling that there is a misalignment between labour market needs and skills supply, also due to a lack of business-science interactions (European Commission, 2020b). The announcement that lower average marks in school exams will be required for entry to universities and technical institutes will increase participation – compensating for the shortfall in student enrolments – and funds for universities which are dependent on it. However, it may further reduce the quality of new entrants, make Lithuanian universities less attractive to foreign students and negatively impact on the balance between the teaching and research missions. Funding for the latter tends to significantly fluctuate depending on the cycles of EU funds. This provides strong incentives for universities to focus on maximising student numbers rather than increasing the

[226] European Commission, (2020d).

scope and impact of research activities, (Martinaitis et al., 2020). To better equip Lithuanians with relevant skills, the Ministry is working on a skills strategy, with OECD support. Results are expected for 2021. At the same time, the number of tertiary programmes has not decreased and the plan for consolidating universities[227] has been reviewed, and lags behind schedule.

8. Promoting adult learning

Adult participation in learning has slightly improved but remains significantly below the EU average. In 2019, 7% of adults reported having a recent learning experience, up from 5.9% in 2017, but still below the average participation rate in the EU (10.8% in 2019). This increase could partly be attributed to the appointment of regional coordinators of non-formal adult education at local level since 2016, even if with only a limited amount of funding. However, the lack of a centralised coordination of funding and limited ministerial actions and programmes keep the rates of participation in adult education rather low. It is notable that training of municipal non-formal adult education coordinators was the only action dedicated to adult education in the structural reform programme launched in 2018. A better coverage of the Active Labour Market policies and an increase in the funding system for upskilling and reskilling could foster participation. In 2017, the term of the Council of non-formal adult education ended and no new one has been appointed yet, despite its legal basis in the Law on Non-formal Adult Education and Continuing Education[228].

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[227] The merger plan of the universities was changed in February 2020. The Government removed the Mykolas Romeris (MRU) and Vilnius Gediminas Technical (VGTU) Universities merger from its action plans. The plans for the Vilnius and Šiauliai Universities merger was approved by Parliament in July.

[228] https://www.e-tar.lt/portal/lt/legalAct/TAR.CE3B174CA7E6/yLcXICpKBz

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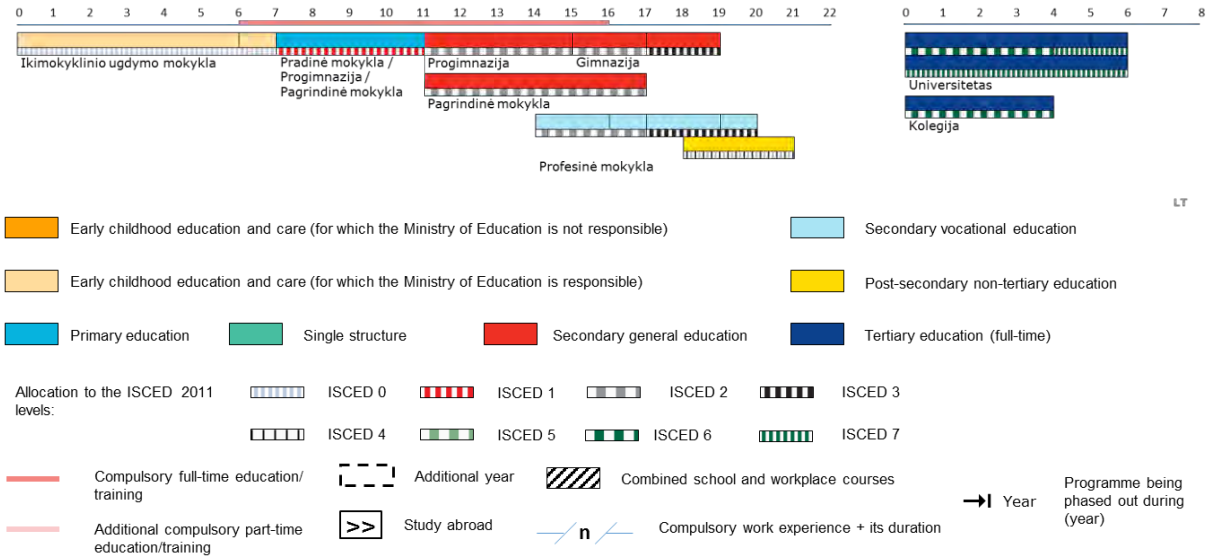
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Veronica DE NISI
Veronica.DE-NISI@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

European Commission

LUXEMBOURG

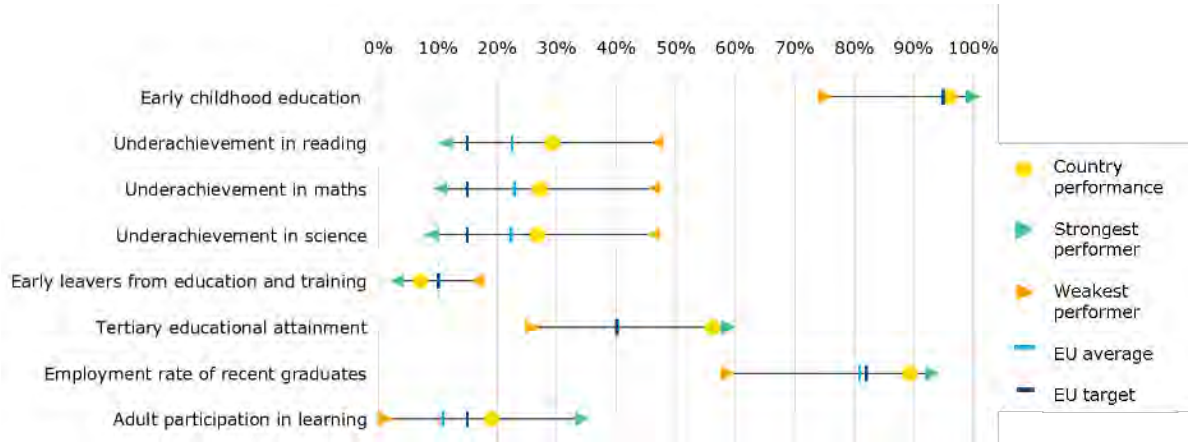
1. Key indicators

Figure 18 – Key indicators overview

			Luxembourg		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			7.7%	7.2%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			46.6%	56.2%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			94.6%	96.1% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		26.0%	29.3% [18]	19.3%	22.5% [18]
	Maths		23.9%	27.2% [18]	22.2%	22.9% [18]
	Science		23.7%	26.8% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		85.5%	89.4%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		13.8%	19.1%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	74.1% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	12.7% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		5.5%	4.6% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€15 050 [12]	€13 593 [16]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€15 169 [12]	€15 118 [16]	: [12]	€7 757 [d, 16]
		ISCED 5-8	: [12]	€35 774 [16]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		5.4%	6.8%	12.6%	8.9%
	Foreign-born		13.4%	8.1%	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		36.5%	43.5%	32.0%	41.3%
	Foreign-born		54.4%	63.1%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		79.3%	78.2%	72.2%	75.9%
	ISCED 5-8		90.4%	94.2%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series, d = definition differs, : = not available, 12 = 2012, 16 = 2016, 18 = 2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

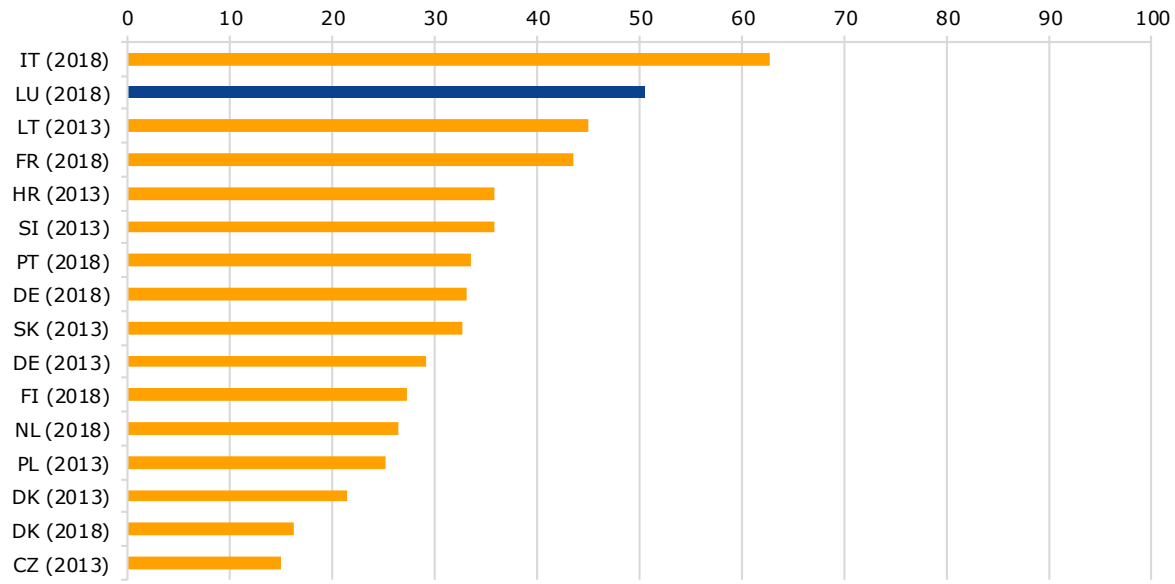
- Recent measures aim to strengthen digital education.
- There is still a large proportion of underachievers in a highly diverse school population.
- Vocational education and training graduates enjoy excellent employment prospects.
- Luxembourg has further increased investment in higher education.

3. A focus on digital education

Luxembourg has launched a strategy to boost digital skills. According to the 2019 Digital Economy and Society Index (DESI), 72% of young people (aged 16-19) report that they have at least basic digital skills, which is below the EU-27 average (82%). 51% of this age group claims to have advanced internet user skills, putting Luxembourg in 19th place in the ranking. As regards information and communication technology (ICT) graduates, Luxembourg exceeds the EU-27 average at 5.8 %. In 2015, the government launched the Digital4Education strategy to boost young people's digital skills. This covers a wide range of actions and options, such as raising cybersecurity awareness, makerspaces where high school students are free to experiment with 3D printers, and free access to the MS Office suite for teachers and to digital classrooms.

Luxembourg students' average scores in computer and information literacy (CIL) are below the EU average. The 2018 International Computer and Information Literacy Study (ICILS) assessed the capacities of students in eighth grade (around the age of 14) to use ICT productively for a range of purposes. Despite its high level of ICT infrastructure, Luxembourg is one of two participating EU countries where more than half of the pupils did not reach the level 2 proficiency threshold (Figure 3). Luxembourg also had the highest within-country variation in score between the bottom 5% and the top 5% (277 points). In comparison, the average difference across EU Member States in ICILS 2018 was 92 points.

Figure 3 - Share of underachievers in CIL proficiency (%), 2018



Source: IEA, ICILS 2013 and ICILS 2018.

Changes in the curriculum are intended to enhance digital competences. In 2017, a new specialisation in ICT was introduced in upper secondary education, as part of a new label for schools called 'Future hub'; this serves to raise the profile of secondary schools that are innovative in ICT. In the study programme for initial teacher education, the use of ICT is one of nine areas in the teacher competence framework. As of 2020-2021, coding will be embedded in mathematics

classes in cycle 4 (age 10-11) and from 2021-2022 it will be taught across all subjects in cycles 1 to 3 (age 4-9). Teachers will receive training and support from specialised teachers, to be recruited in 2020. In secondary education, computer science will appear as a new subject in 2021-2022, and will include coding and computational thinking. The government expects that the 2023 ICILS study will already reflect the impact of these measures.

Box 1: European Social Funds project CODEKLASS

Project leader: Ministry of National Education, Children and Youth

Total budget: EUR 152 512 (ESF: 50%)

Duration: 01/01/2019 - 31/12/2020

CODEKLASS offers a two-week training programme, 'CodeStart', for young people aged 18 to 29 from all academic backgrounds and employment situations: students, school dropouts, and people in employment or looking for a job. Participants learn how to develop web pages and create a mobile game while gaining insights into the importance of digital skills for their future studies and careers. This programme ran in 2019 and 2020, and will be integrated into the regular offer of the Adult Training Service. The courses will be delivered nine times over two years, each consisting of 60 hours of training for 20-25 participants.

http://www.codestart.lu

4. Investing in education and training

Public expenditure on education is above the EU average and was further increased to support parents during the school closure period. Public expenditure on primary to tertiary education per student expressed in purchasing power standards was the highest in the EU in 2016 (the last year for which data is available), at 14 987.6 (followed by Austria with 10 872.9). Public expenditure on education as a proportion of GDP is not a reliable indicator, because cross-border workers and foreign capital invested in Luxembourg make a significant contribution to the country's GDP. Measured as a percentage of the total public budget, Luxembourg spent 11% on education in 2018, against an EU-27 average of 9.9%. Teachers' statutory salaries, which represent 68.6% of education expenditure, are twice as high as salaries of other tertiary graduates (OECD 2019). As part of the COVID-19 measures, the government ordered the closure of all schools and childcare facilities for an extended period of time. In order to allow parents to take care of their children, special leave for family reasons was introduced. The budgeted amount for this was estimated at EUR 222 million, depending on the length of the closure of educational institutions (Government 2020).

The school population is growing and becoming ever more diverse. Between 2009 and 2019, the school-age population (4-16 years old) increased by 9.81%[229]. According to Eurostat projections, it is expected to further increase by 2.98% by 2030[230] compared with 2020. In the 2019-2020 school year, pupils with Luxembourgish as their first language became the minority both in primary (34.5%) and secondary education (41.1%) (MENJE 2019). The exceptionally high cultural and linguistic diversity represents particular challenges to the school system.

5. Modernising early childhood and school education

Action to improve access to and the quality of early childhood education (ECE) may help level out development gaps. Luxembourg has invested heavily in extending access to early childhood education and non-formal day-care facilities in the last 10 years, nearly tripling the number of places and doubling the availability of child minders (Neumann 2018). Compulsory education starts with two years of pre-school from age 4, which can be supplemented with an

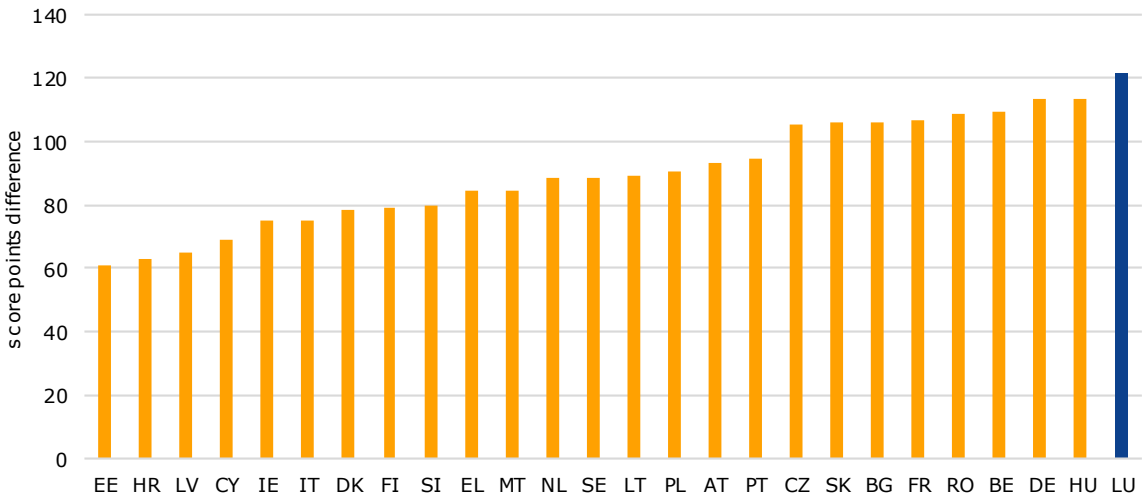
[229] [demo_pjan]

[230] [proj_19np] Extracted on 15.09.2020.

optional year from age 3. 96.1% of children aged 4-6 participate in ECE, above the EU average (94.8%). In 2018, 60.5% of children under 3 attended ECE (EU average: 34.7%), the second highest rate in the EU. In 2016, the Youth Act established national quality standards in ECE which all providers had to comply with by September 2017 in order to be eligible for the state co-financing scheme (*chèque-service accueil*). This includes activities to familiarise children aged 1-4 with Luxembourgish and French. Childcare vouchers give parents reduced rates at crèches, after-school centres, mini-crèches and day-care centres. In 2019, the childcare system was extended to include a new type of institution, mini-crèches. These are small-scale day-care centres for children aged 0-12 years that look after a maximum of 11 children. Free high quality ECE should help to reduce educational inequalities and improve learning outcomes.

Pupils' basic skills are below the EU average and strongly linked to socio-economic status. Luxembourg's average levels of competence, as measured in the OECD Programme for International Student Assessment (PISA), were lower in 2018 than in 2015 and 2012 in reading and science but stable in mathematics. They were all significantly lower than the EU averages. The proportion of low achievers is well above the EU average in all three areas tested: 27.2% in mathematics, 29.3% in reading and 26.8% in science, compared to 22.9%, 22.5% and 22.3% respectively at EU-27 level. The proportion of top achievers for each subject is slightly lower than the EU average. Girls outperform boys by 29 score points in reading, which corresponds to the EU average (28 score points). The gap in performance between the highest and lowest-achieving students in Luxembourg has widened in both reading and mathematics since 2003. In 2018, advantaged students scored 122 points higher than their disadvantaged peers, the largest such gap observed across all EU countries (Figure 4). Only 1% of disadvantaged students performed at the top levels (5 or 6), against the EU-27 average of 2.5%.

Figure 4 - Mean score difference in reading between advantaged and disadvantaged students, PISA 2018



Source: OECD (2019), PISA 2018.

Immigrant status is a strong predictor of performance but less important than socio-economic background. Students with a migrant background scored 35 points lower than native-born students in reading. This gap is reduced by half after accounting for students' gender and socio-economic profile and between-school difference. Students born in Luxembourg to parents born abroad are not catching up with their non-immigrant peers. On the positive side, the reading performance of students with a migrant background has improved significantly since 2009. Students with lower socio-economic status are the most likely to fall behind in all subjects and to be steered towards the technical tracks of secondary school. Socio-economic status is also the factor that has the biggest impact on pupil's performance in national surveys: more than half the pupils in the bottom quarter of the socio-economic scale perform below the basic level (*niveau socle*) in third grade, and the proportion that fail to achieve the basic level (level 2, L2) by ninth grade drops much less than among their counterparts in the top quarter, irrespective of their mother tongue (Sonnleitner et al. 2018).

Early school leaving remains below the EU average. The rate of early leavers from education and training was 7.2% in 2019. This is significantly below the EU average of 10.2%, but the figure should be interpreted with caution because of the limited sample size. National estimates based on the actual number of young people not completing upper secondary education indicate that early school leaving has been on the rise since 2009 and stood at 12.4% in 2016 (MENJE 2018a). The Education Ministry's Local Action for Youth offices are responsible for identifying early school leavers, contacting them and helping them return to education or find a job. A School Mediation Service was created in 2018 to examine cases of pupils at risk of dropping-out, pupils with special educational needs, and pupils born abroad, who started their school career outside Luxembourg and do not have the necessary skills in German, Luxembourgish or French to follow regular education. In 2019, the proportion of 20-34 year-olds who were not in education, employment or training (NEET) was 8.1% (EU-27 average: 16.4%).

Grade repetition is common and is strongly linked to early school leaving. About 20% of pupils have repeated a year by the third grade of primary school (MENJE 2018b); by the end of secondary education, this applies to 60%. Grade repetition is particularly high among pupils in technical secondary education (*enseignement secondaire général, ESG*), where 77% of final grade pupils will have repeated a year at least once (MENJE 2018b). In the academic track of secondary education (*enseignement secondaire classique, ESC*), the proportion is lower, but still significant (33%). Failing two years in the course of one's studies is the clearest predictor of early school leaving (MENJE 2017a). As of 2017-2018, the number of subjects covered for the upper secondary school leaving certificate in ESC was reduced, to allow pupils to focus on those that match their further study plans. As of 2018-2019, similar arrangements were introduced in ESG. This may improve the final results and completion rates of secondary education.

Pupils' performance is heavily influenced by their ability to cope with the trilingual system. The vernacular language at primary level is Luxembourgish, while pupils learn to read and write in German. All subjects (except French) are taught in German. While the main teaching language in technical secondary education remains German, in the upper grades mathematics is taught in French, which is the language of the final exam. In academic secondary education, the teaching language switches from German to French in seventh grade for mathematics and in tenth grade for other subjects. This system is challenging for all, but especially for pupils who speak a language other than Luxembourgish at home. There is scientific evidence[231] that reading and numeracy skills develop best when they are acquired in the mother tongue. From 2018-2019, the teaching of French, German, English and mathematics has been adapted to pupils' competence in ESG. Depending on their results at the end of the first year, pupils follow these subjects either all at basic or all at advanced level in their 2nd and 3rd years. Thereafter, pupils are streamed into the different tracks of upper secondary education.

Teachers and families received significant support during the school closure linked to the COVID-19 pandemic. A national learning platform 'schouldoheem.lu' was created to provide digital learning materials, daily refreshed with new content. This platform provides educational material for primary and secondary education, links to interesting platforms, online challenges in various topics, links to helplines, etc. A second website called 'kannerdoheem.lu' provided recreational materials and ideas for non-formal learning, games and leisure activities for limited home spaces. In primary school, teachers provided pupils with a work plan and learning materials. Secondary school teachers gave regular assignments and feedback to their pupils in languages, mathematics and their specialisation subjects. Following the re-opening on 25 May, pupils revised the work done during the lockdown with their teachers. To reward pupils' participation in distance learning, teachers could add a bonus of 1 to 4 points to the average mark in each subject. Parents were allowed to take leave for family reasons if they had to look after children under 13 during the closure of their school or childcare facility.

[231] Thomas and Collier examined the records of 700 000 language minority students, speaking dozens of home languages, in five school systems between 1985 and 2001. They found that the strongest predictor of learner success at upper secondary level in the dominant (English) language education system was the number of early years of instruction the learners had received in their mother tongue.

2020 examinations and the new school year were adapted to the exceptional circumstances. The end-of-primary national tests, which form the basis of the orientation for secondary education, were cancelled. Instead, the orientation decision was based on pupils' performance during cycle 4 (fifth and sixth grade). Orientation interviews, where the class teacher and parents reach a joint orientation decision, were maintained. For pupils moving on to the next (two-year) cycle of learning, an end-of-cycle evaluation was drawn up at the end of the school year. Secondary school leaving exams started on June 25, in line with the original schedule. To give each student a fair chance of passing the final year, the examination questions focussed exclusively on the content covered in class before the start of the school closure. In July, the Minister of Education announced specific measures to reduce pupils' deficit linked to the lockdown (MENJE 2020). All pupils were offered a two-week catch-up session before the start of the 2020-2021 school year, and additional coaching sessions will be offered during the first trimester for pupils who lag behind.

Since 2018, more flexible entry requirements for the recruitment competition for early childhood and primary education teachers have attracted more candidates. Despite the high salaries - double the average salaries of other tertiary graduates - Luxembourg faces a shortage of teachers. This is partly linked to the requirement to demonstrate a command of the three official languages. In 2018, the conditions for applying for the primary education recruitment competition were relaxed with respect to the choice of age groups to teach. This led to a sharp increase in the number of candidates. The number of recently graduated candidates more than doubled. New features included the possibility to apply with a qualification for cycle 1 (pre-school) only or for cycles 2-4 (primary education), as well as with a qualification for all cycles (1-4). Also, in 2018/2019, the amended Primary Education Act (Government 2018a) allowed candidates with a bachelor's degree in programmes related to primary education to be recruited as temporary teachers. In 2016/2017, one in four primary and secondary teachers had a temporary contract. When schools reopened on 25 May, classes were split to have no more than 10 children in a room at a time. Pupils were attending school only every second week; the other week they repeated the material learnt either at home or in childcare. The Ministry of Education launched a call for 500 additional primary school teachers to cover the corresponding increase in demand, to which 1 000 candidates responded.

Box 2: Towards a more inclusive education for children with disabilities

The policy on children with disabilities has been changing rapidly. At present, 1.24% of primary and lower secondary school pupils are recorded as having special educational needs (SEN), of whom 38% are in inclusive school settings (MENJE 2020). Following Luxembourg's 2011 ratification of the Convention on the Rights of Persons with Disabilities (UN-CRPD), numerous measures were introduced in the education sector. In 2017, the government started giving extra financial support to early childhood education and care (ECEC) services committed to following the inclusive ECEC concept (*secteur de l'éducation et de l'accueil – inclusif, SEA*) (MENJE 2020). In May 2017, a new law specified that each two-year cycle can be extended by one year where learning difficulties exist.

The 2017 law reorganised the care of children with special needs based on a three-level approach: national, regional and local (Government 2017). At local level, specialised teachers support primary schools in implementing adapted teaching. In 2016-2017, some 150 specialised teacher posts were created, two-thirds of which had been filled by 2019 (MENJE 2020). These specialist teachers assist pupils in the classroom. They liaise with parents and the regional inclusion commission. Their mission is to coordinate and contribute to the schooling of SEN pupils. They also participate in drawing up the school development plan with regard to the care of SEN pupils. At regional level, support teams were created (*Équipes de soutien des élèves à besoins éducatifs particuliers ou spécifiques*, ESEB) to take over whenever the local care is not sufficient. At national level, a law in July 2018 introduced nine specialised centres for children with special needs. These provide a specialised diagnostic evaluation for every child referred. Specialised staff support pupils and teachers in regular education. The centres also organise training workshops for school leaders and teaching staff. A special subsidy exists for schools to finance `reasonable´ adaptations for disabled pupils. Additionally, a national inclusion commission was set up as a reference authority for professionals, institutions, and parents. The

decision as to how a child is to participate in education stays with the parents.

The 2018-2023 government programme requires a support team for SEN pupils to be created in each secondary school. Currently, some 30 support staff assist 18 secondary schools (MENJE 2020). The programme also required an action plan to be drafted to implement the UN-CRPD; it was published in 2019 (*Plan d'action national 2019-2024 de mise en oeuvre de la Convention de l'ONU relative aux droits des personnes handicapées*). The plan lists 97 actions with indicators and a timetable, as a basis for evaluation.

In higher education, inclusion of students with disabilities has been regulated by law since the 2018 University Act, which provides for `reasonable´ adaptations of the course structure and duration for students with special needs (Government 2018).

6. Modernising vocational education and training

Vocational education and training (VET) graduates continue to enjoy excellent employment prospects. The employment rate among recent VET graduates is 100% (EU average: 79.1%). This data needs to be treated with caution because of the small size of the sample. Key sectors, including finance and ICT, face labour shortages and skills mismatches. 71% of enterprises who recruited or tried to recruit ICT specialists in 2017 reported having had hard-to-fill vacancies, significantly above the EU average of 53% (DESI 2019). A digital skills and jobs coalition[232] with public and private stakeholders aims to promote digital skills initiatives.

In 2019, the Labour Code and the 2008 Act reforming vocational training were amended to make vocational training more attractive and effective (Government 2019). In agreement with the professional chambers, the reform introduces technical adaptations to improve the quality of vocational training. These include allowing learners who do not manage to complete their course within the normal training period to extend their apprenticeship phase by up to two years, and the introduction of 'on-the-job' vocational training allowing employees without certification for their trade or profession to complete training in parallel with their job and to obtain a qualification. In 2019-2020, a new form of end-of-term assessment was introduced, with a separate mark for each module. If a student fails a module, they can catch up later without having to repeat the whole year (MENJE 2019c). In 2019-2020, apprentices were exempted from the second semester modules because of the special circumstances.

7. Modernising higher education

Luxembourg has set itself the target of raising the tertiary attainment rate among 30-34 year-olds to 66% by 2020. In 2019, the rate stood at 56.2% (EU-27: 40.3%), the third highest in the EU, but well below the national target. This is partly thanks to the high proportion of graduates in the migrant population (63.1%, as compared with 43.5% of native Luxembourgers). In 2017, Luxembourg had the second largest proportion of international graduates[233] in the EU at master's (43%) and doctoral level (167%). Study programmes are bilingual, trilingual (French, German, English) or entirely in English. The employment rate of recent tertiary graduates in 2019 was 94.2%, well above the EU average of 85.0%, reflecting strong demand for highly skilled workers. Tertiary graduates also enjoy a higher wage premium than their counterparts elsewhere in the EU (OECD 2017).

The government has increased financial support for studies. The government has increased the financial contribution to the University of Luxembourg's budget from EUR 72 million in 2009 to EUR 202.4 million in 2020. In July 2018, the government signed a new multi-year funding agreement with the University, involving an investment of more than EUR 1.4 billion in higher education and research for 2018-2021 (Gantenbein & Mironescu 2018). This represents an increase

[232] https://www.digitalcoalition.lu/

[233] Inward degree mobility rates are computed as inward degree–mobile graduates as a percentage of graduates originating in the country.

of 25% compared to 2014-2017. The government also committed to reform the grant system (Government 2018). The aim is to take into account the costs of studies, students' social situation, and performance (MESR 2018). Students in post-secondary vocational training will also be able to benefit from this system.

The University of Luxembourg will launch new bachelor programmes in engineering, medicine, physics, and mathematics as of September 2020. These programmes have evolved from existing study tracks, after being redesigned as full bachelor programmes. They respond to an increasing demand for a skilled workforce in data science, analytical reasoning, computational science, engineering and medicine. Medical studies are supported by enhanced inter-university cooperation at medical master's level, guaranteed by a specific protocol signed with France. In light of the special circumstances linked to the COVID-19 pandemic, the enrolment process for 2020-2021 was fully digitalised and simplified. Application deadlines for non-EU students were extended.

8. Promoting adult learning

Overall participation in the labour market and adult learning is high, but lower among low-skilled and older workers. 19.1% of adults surveyed participated in learning, against an EU average of 10.8%. Participation is much less common among low-skilled workers (6.8%), increasing the risk of their skills becoming outdated and their ending up in early retirement. The employment rate among older workers (55-64 years) remained particularly low (43.1%) in 2019, against an EU average of 59.1%**.** In its coalition agreement, the government undertook to promote the quality of lifelong learning by introducing a personal training account and training vouchers allowing all employees to follow basic training for digitised professions for free. In June 2019, it was announced that a new quality assurance agency was to be set up (MENJE 2019d).

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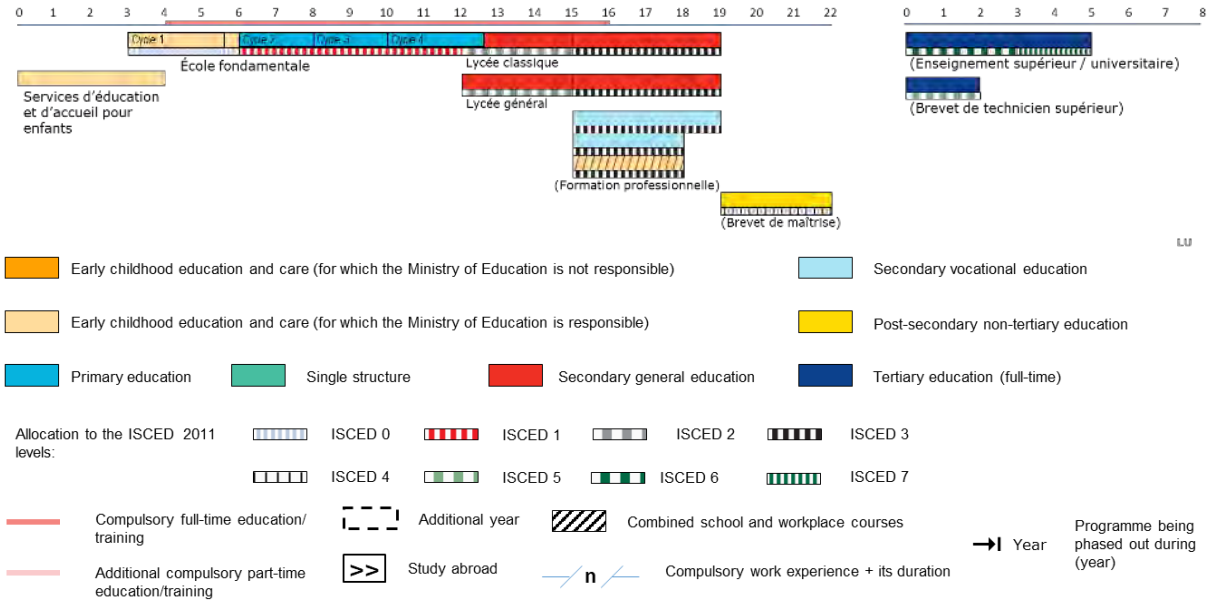
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Livia RUSZTHY
Livia.RUSZTHY@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

MALTA

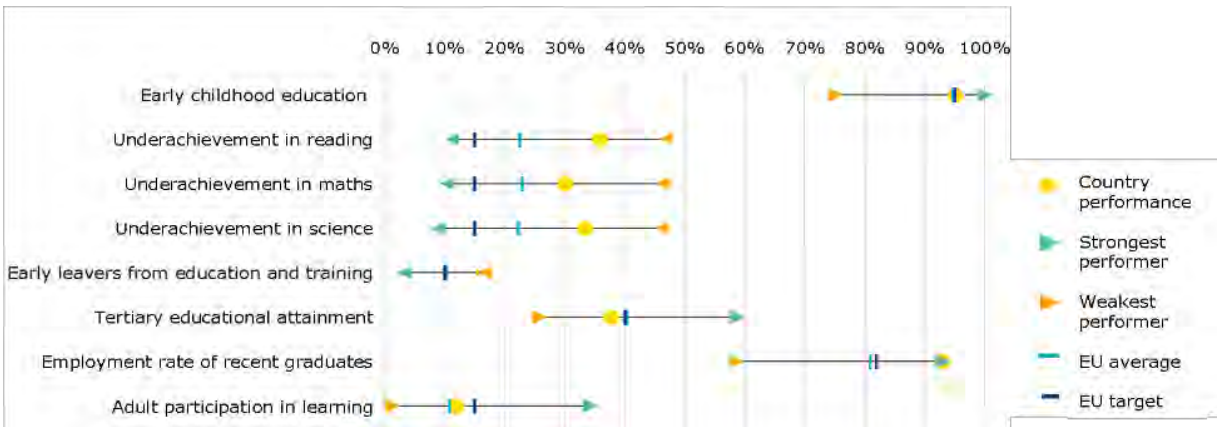
1. Key indicators

Figure 19 – Key indicators overview

			Malta		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			25.7%	16.7%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			21.9%	37.8%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			94.6%	95.3% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		36.3%	35.9% [18]	19.3%	22.5% [18]
	Maths		33.7%	30.2% [18]	22.2%	22.9% [18]
	Science		32.5%	33.5% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		92.9%	93.1%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		6.2%	12.0%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	9.4% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	5.3% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		5.4%	5.2% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€7 446 [12]	€6 722 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€12 614 [12]	€8 352 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€32 669 [12]	€14 423 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		26.0%	15.4%	12.6%	8.9%
	Foreign-born		: [u]	27.0%	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		21.9%	32.7%	32.0%	41.3%
	Foreign-born		22.1% [u]	50.3%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		88.6%	88.8%	72.2%	75.9%
	ISCED 5-8		97.0%	95.0%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs; u = low reliability; : = not available; 12 = 2012, 16 = 2016, 17 = 2017, 18 = 2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Addressing high underachievement and early school leaving by better supporting students' well-being and learning needs continues to be a priority; however, the COVID-19 crisis has delayed implementation of reforms.
- Strengthening policy evaluation will ensure more effective education policies, including better student learning outcomes.
- Disadvantaged students have been supported during the school closure by providing them with computers, internet connections and additional materials. This may help counterbalance the impact of the crisis.
- Efforts have been made to make vocational education more responsive to technological development. Participation in adult learning among the low-qualified remains low.

3. A focus on digital education

Digital education was set as a policy priority early on, to sustain a strong digital economy. Several national policies and programmes have been put in place to develop digital competences from an early age. In order to ensure a sufficient supply of information and communication technology (ICT) professionals to meet labour market demand, policies are also intended to attract more students to ICT. Nonetheless, in 2019, 67.3% of enterprises that tried to recruit ICT specialists had difficulties finding employees with the right skills (European Commission 2020a). An audit launched by the eSkills Foundation in 2019 will collect further data on mismatches between education and labour market needs. Despite the sustained strong focus on digital education and investment in infrastructure, there is no regular evaluation of the policies being pursued (European Commission/EACEA/Eurydice 2019).

Schools and pupils are comparatively well equipped with ICT tools, and additional support was provided to disadvantaged pupils during the COVID-19 crisis. Maltese pupils attend schools which are among the most digitally equipped in the EU, in particular at primary level (82% v 35% at EU level). This is mainly the consequence of the project `One Tablet Per Child', which provided tablets at primary level with the European Social Fund support. This has also been very effective in enabling the switch to online learning during the COVID-19 outbreak, making the transition smoother for pupils in the last three years of primary. However, according to school principals, there is a large socio-economic gap in access to ICT: a smaller proportion of pupils in disadvantaged schools have digital devices connected to the internet (46% v 82% in advantaged schools) and they have poorer computing capacity (Reimers and Schleicher 2020 and OECD, PISA 2018 database). During the COVID-19 lockdown, free internet and computers have been distributed to disadvantaged children to continue their studies at home. An online platform[234] with free educational contents was made available to parents and students in April. Parents could also opt for up to 40 sessions on online learning offered by the Institute for Education, while support for teachers was provided mainly in the form of educational resources, initially through the Ministry's official website. These two platforms have principally allowed communicating tasks such as homework.

A comparatively high proportion of young people possess above basic digital skills. 74% of those aged 16-19 reported having above basic overall digital skills in 2017 (EU-27: 57%). However, students at secondary level report lower levels of confidence in their digital competences as defined in the DigComp framework[235], compared to the EU average. Furthermore, in line with most Member States, more than half of secondary students can be defined as `less digitally active with a rather moderate level of support´, which means they have poor access to digital technologies at home, at school or outside school, engage less frequently in digital activities during

[234] https://teleskola.mt/. This site includes up to 1 000 lessons and activities for students from early years up to the end of secondary school. The Faculty of Education also launched a website as part of its outreach programme to support learners, educators and parents.

[235] https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework

lessons or outside school, and evaluate the impact of ICT use during lessons less positively. This is particularly the case at upper secondary level, where ICT is taught as one of the applied subjects following the reform of the secondary school system, and teachers tend to use digital devices less often during lessons than in the other, lower, levels of education (European Commission 2019a).

Supporting teachers is crucial to making investment in ICT beneficial for all. The effectiveness of ICT at school depends on the actual use that teachers make of it and on their ability to integrate it into their teaching practices (Bulman et al. 2016; Comi 2017). There is a need to ensure that teachers have the appropriate competences so that the use of digital devices does not form a distraction for pupils and have a negative impact on their educational outcomes (European Commission/EACEA/Eurydice 2019). In Malta, high investment in digital equipment is accompanied by short teacher training courses covering the pedagogical use of ICT in teaching and learning, and there are IT support teachers who assist teachers with technical aspects. This has helped Maltese teachers to gain a high level of confidence in their digital competences compared to the EU average (OECD 2019a). However, according to school principals, teachers tend to be less well prepared and have less access to professional development practices on using digital devices in socio-economically disadvantaged schools than they do in advantaged schools (Reimers and Schleicher 2020)[236]. Moreover, fewer than one in four students in compulsory education attend schools that have policies and/or actions to assess the outcomes of using ICT for teaching and learning (European Commission 2019a). Coupled with the short duration of teacher training[237], this may hold back the introduction of innovative teaching practices that could help improve student performance, thereby reducing the effectiveness of the investment in digitalisation. During the quarantine period, teachers have been encouraged to provide online learning without the obligation of live streaming and asked to cover the most relevant parts of curriculum. In April, guidelines for online learning were published. However, no information on how many teaching hours have taken place is available.

4. Investing in education and training

Public expenditure is above the EU average, demonstrating a strong commitment to education and training. General government expenditure on education, both as a proportion of GDP (5.2% v EU-27 4.6%) and as a proportion of total general government expenditure (14.2% v EU-27 9.9%), was among the highest in the EU in 2018. Smaller average class-sizes and lower student-to-teacher ratios (OECD 2019d) are among the factors that contribute to a high level of investment. While this may allow teachers to focus more on the needs of individual students, evidence of the effect on student performance is mixed and suggests that this allocation of resources should be carefully evaluated against other measures. For instance, investing in more high quality professional development for teachers could help improve student achievements more efficiently and effectively (OECD 2019b).

5. Modernising early childhood and school education

Participation in early childhood education remains around the EU average for children under 3 years of age but it is decreasing for the older age group. The free childcare scheme helped to double the proportion of children below the age of 3 in formal childcare between 2015 and 2019 (38.3%). Participation in early childhood education among 4 year-olds in 2018 remained around the EU average (95.3% v 94.8%), but it continues to decline (-2.7 pps compared with 2016). The implementation of the new curriculum for early years, mainly at pre-school level, continued in 2019/2020, with training provided to kindergarten teachers. The 2019 Education Act raised the minimum entry requirement for staff to bachelor's degree level. This is a first step towards higher quality in the sector. The National Standards for Child Day Care Facilities (2006)

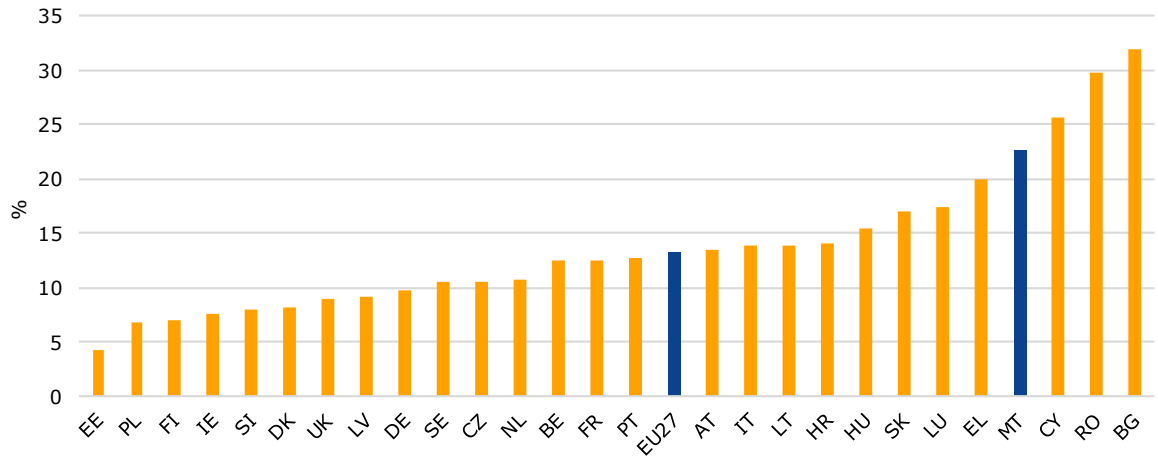
[236] Only 37% (EU: 68%) of pupils in disadvantaged schools have well-prepared teachers, compared to 59% (EU: 67%) in advantaged schools. 43% (EU: 68%) of pupils in disadvantaged schools have teachers who have access to professional development practices on using digital devices, compared to 62% (EU: 68%) in advantaged schools.

[237] Only 6% of students at primary level (EU-28: 45%) have teachers who have spent more than 6 days on ICT-related professional development activities during the past two years; the figure for lower secondary level is 10% (EU 55%), while that for upper secondary level is 22% (EU 47% (European Commission, 2019a).

have been revised. A reference group made up of major stakeholders is currently being consulted prior to launching a wider public consultation.

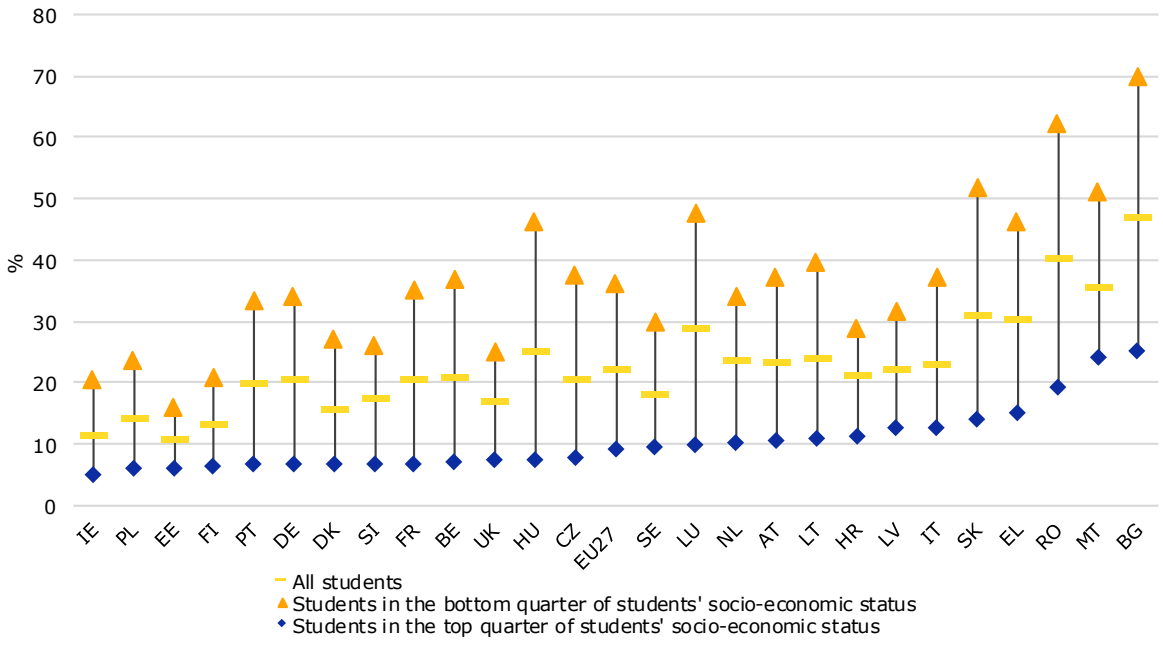
Average levels of basic skills are low and a large percentage of pupils fail to achieve minimum proficiency levels. The latest results of the OECD Programme for International Student Assessment (PISA) 2018 show that, in all three subjects tested (reading, mathematics and science), Malta's mean performance is below the EU average and the proportion of 15 year-olds underachieving in all three domains is among the highest in the EU (22.6% v 13.2%) (Figure 3). In this context, the Council of the European Union adopted a country-specific recommendation for Malta, calling on it to 'strengthen the quality and inclusiveness of education and skills development' (Council of the European Union 2020). While the proportion of top performers has decreased since the last round, the proportion of underachieving pupils remains practically unchanged since 2015 and is above the EU average across the entire socio-economic distribution (OECD 2019c). Around 51% of pupils from the bottom socio-economic quartile lack basic skills in reading (EU 36.4%). This is more than twice the rate in the top quartile — even though the rate for the top quartile is also comparatively high (24.3% v 9.5%) (Figure 4).

Figure 3 – Low achievers in all three domains, 2018



Source: OECD (2019), PISA 2018.

Figure 4 – Low achievers in reading by student socio-economic status (ESCS), 2018



Source: OECD (2019c), PISA 2018. Note: the EU average does not include ES results.

Better support for students' learning needs is key to achieving higher quality. The implementation of the new curricula and the introduction of formative student assessment practices in compulsory education have been postponed until 2021 due to the COVID-19 outbreak. These reforms may help achieve better results in the future if matched by effective implementation, evidence-based evaluation and adequate support to teachers and learning-support educators. According to data from the 2018 OECD Teaching and Learning International Survey (TALIS), lower secondary teachers report a greater need (compared to the EU average) for professional development in assessment practices (14.9% v EU-22 11%) and in the analysis and use of student results (13.3% v 9.5%). With support from the European Commission's Structural Reform Support Programme, Malta is working on strengthening external school evaluation (European Commission 2020c). This could further contribute to developing a coherent strategy to improve learning outcomes (Bergbauer et al. 2018). An effective interplay between external and internal evaluation mechanisms would allow schools to adapt to the changing needs of learners (Hanushek et al. 2013).

The COVID-19 pandemic may exacerbate educational inequalities and low levels of basic skills if its impact is not fully assessed. The closure of schools in mid-March and the shift to remote learning could have a long-lasting effect on student learning outcomes. Teachers, students and families need to be effectively supported, and adequate compensation measures are necessary to help low-achieving students to catch up in the months ahead. Evidence shows that less time spent in learning can lead to loss of learning and have a negative impact on student outcomes (Lavy 2015). This is particularly true for disadvantaged pupils, who are more likely to be underachievers and to have less access to high quality home support and extracurricular activities. To support students and families during the lockdown, those who are at risk of poverty who usually benefit from free lunches at school received their daily lunch at home, and online services for psychological counselling and for pupils with special educational needs were set up. The government's task force decided to drop the final assessment for primary and lower secondary schools and to assess upper secondary students on the basis of their mock exams held before the COVID-19 outbreak[238], in order to keep a focus on teaching and learning until the end of the school year. While this could be a fair decision under current circumstances, it could also negatively affect students' motivation and learning if formative assessment practices are not well developed. Moreover, without student assessment results it could be more difficult to make plans for the coming years and to evaluate the impact of distance learning. The Ministry for Education and Employment has established a framework for the re-opening of educational institutions. This has been discussed with the main stakeholders, at all levels, from childcare to tertiary level and including the different unions and associations. It follows the model proposed by the United Nations and has been adapted to suit Maltese needs. For each probable scenario, the framework is looking at five main aspects: health and safety, information, development and training, the need for quality education, the need for education to reach every student, and the necessary financing[239]. In May, the government also launched an ad-hoc expert group whose remit is to propose ideas for the education system, also in light of COVID-19. National experts were appointed from different economic sectors. A report is due by mid-September.

Pupils attending private schools perform better. PISA 2018 shows that disadvantaged Maltese students, in spite of their background, are more likely to be top performers in reading than their European peers (13.3% v 11% at EU-27 level), suggesting that the Maltese system is to some extent able to compensate for disadvantage. Moreover, PISA 2018 shows that socio-economic background only explains 7.6% of variation in reading performance (EU-27: 14.2%). However, performance remains strongly related to the type of school a pupil attends, with a gap between private and public schools of about 100 PISA points, equivalent to more than two school years (European Commission 2020). This could further exacerbate the differences between pupils from low and high socio-economic backgrounds (Figure 4). PISA 2018 also shows that results of

238 Upper secondary students will also have the opportunity to sit the final examinations during the September session.

239 Information provided by the Ministry for Education and Employment on 10 June 2020.

independent and church schools have worsened while performance in public schools has remained stable since the last round[240].

Efforts are being made to make the system more inclusive but challenges remain. The proportion of pupils born abroad is 6.6% and increased by 5 pps between 2009 and 2018. To foster their inclusion, induction programmes have been set up for newly arrived pupils who cannot yet speak Maltese or English. This may help to reduce both the average difference in reading performance between foreign pupils who speak English at home and those who do not (a difference in PISA 2018 of 63 score points), and the segregation of migrant students[241] (OECD 2019d). Several programmes are already in place to foster inclusion, particularly of children with special educational needs. Public schools are required to implement the 2019 inclusive framework, involving drawing up their own plan following a self-evaluation exercise. The COVID-19 outbreak has caused the suspension of the work on school development plans. The ongoing work on strengthening quality assurance systems is likely to be key to ensuring effective implementation (Bloom et al. 2015), greater consistency with existing measures and favourable conditions for subsequent related actions, for example against bullying.

Improving students' well-being could contribute to better learning outcomes and to reducing early school leaving. Although it has declined since 2009, early school leaving is still the second highest in the EU (16.7% v 10.2% EU-27 average in 2019) and far from the national Europe 2020 target of 10%. Nevertheless, it has decreased by 0.7 pps in the last year, driven by a decline of around 1 p.p. among girls (14.8% v 18.3% for boys). The introduction of education and careers guidance in the school curriculum from the 2018/2019 school year may further help to prevent students from leaving education early. PISA 2018 also shows that bullying is a major problem in Malta: about 32% of pupils report being bullied at least a few times a month, compared to 22.1% at EU-27 level, with a significantly higher rate among low-achieving students (47.3% v 25.5% for high achieving students). Together with a relatively high proportion of pupils who do not feel they belong at school (36.2%), this further contributes to a low reading performance (-40 PISA points in reading) and may impact on the high school dropout rate. During the lockdown, information has been collected from teachers to better support parents' and children's well-being.

Box 1: The Eco-School programme - Promoting sustainable lifestyles in schools

The Eco-School programme is an international programme launched in 1994 by the Foundation for Environmental Education and in place in Malta since 2002. Eco-Schools promotes a whole-school community approach (involving students, teachers and parents) to sustainable development through student-initiated policy and curricular actions that are integrated into the school's development plan

The National Curriculum Framework includes Education for Sustainable Development as one of the cross curricular themes at primary and secondary level. Catering for 85% of the total student population, Eco-Schools is the major cross-curricular programme re-orienting education to support sustainable development.

https://www.ekoskola.org.mt/

[240] Information provided by the Ministry for Education and Employment in June 2020. For students attending church schools, there were statistically significant falls in mean scores in mathematics, reading and science between 2015 and 2018. For those attending independent schools, there was a statistically significant fall in mean science scores between 2015 and 2018. However, the changes in mean mathematics and reading scores were not statistically significant. For students attending State schools, the changes in mean mathematics, science and reading scores were not statistically significant between 2015 and 2018.

[241] OECD, PISA 2018 Database, Table II.B1.9.11.

6. Modernising vocational education and training

Efforts are underway to address challenges posed by technological developments and to promote excellence in the provision of innovative technical and tertiary vocational education (VET). The proportion of VET learners at upper secondary level enrolled in programmes involving work-based learning rose to 35% in 2018 from 32% a year earlier, continuing the upward trend recorded in the past five years. Following a decline in 2017, enrolments in upper secondary VET increased from 27.1% to 28.5% in 2018. The new secondary school system (European Commission 2019b) will help increase enrolment in vocational and applied paths, by making them more attractive. The Malta College of Arts, Science and Technology, MCAST, launched a master's degree in vocational education applied research to address the challenges posed by Industry 4.0 by shifting from traditional education programmes to innovative practices and blending team delivery, team learning with work experience, team assessment and research. The Institute of Tourism Studies is preparing learners for technological innovation through its Centre for e-Learning Technologies, by providing online learning opportunities for students. The plan is to extend the programme to online workers in the hospitality industry. Despite the closure of all education institutions in response to the COVID-19 outbreak, VET centres have continued conducting lectures through distance learning, while practical sessions have been postponed.

Box 2: Adding Value: Nurturing Learning Journeys

Through the European Social Fund project `Adding Value: Nurturing Learning Journeys´, the Malta College of Arts, Science and Technology aims to provide flexible teaching approaches and mentoring to engage vulnerable and foreign students. The project identifies barriers to training encountered by disadvantaged individualsand provides support to help them increase their skills, including language skills, thereby allowing them to become economically independent. This is done by providing tailor-made education, training and support. The project was approved in 2017, and 32 skills kits have been offered so far to students at MCAST and secondary schools. A study was carried out to determine which gaming techniques could improve student motivation and levels of engagement in the classroom. Virtual and Augmented Reality will also be introduced in vocational programmes.

https://www.mcast.edu.mt/

7. Modernising higher education

Tertiary educational attainment has risen further, mainly due to the arrival of EU nationals in the labour market. The tertiary educational attainment rate of people aged 30-34 increased by 3.1 pps in the last year, to 37.8% in 2019 (EU-27: 40.3%). At 17.6 pps, a large attainment gap exists between native-born (32.7%) and foreign-born individuals (50.3%), with a considerable difference between people from non-EU countries (45.8%) and EU nationals (63.7%). For the latter, the rate increased by 11 pps between 2018 and 2019. This reflects Malta's high reliance on foreigners to meet skills shortages and sustain economic growth (European Commission, 2020a). The number of new entrants to tertiary programmes continued to increase between 2017 and 2018 (+8.1%), which is highly likely to be driven by the increase in EU nationals (+29.4%) in the 20-24 age group over the same period. In addition, the increasing number of part-time courses at tertiary level could also have a positive impact on participation trends. These positive trends can continue provided that COVID-19 does not have a long-term impact on early school leaving or on university dropout rates. Due to the crisis, lessons and exams have been held online and admission criteria have been reviewed to ease the transition from secondary level.

Efforts are underway to better align higher education with labour market needs. Despite the very high employment rate of recent tertiary graduates (95% v 85% at EU level in 2019), skills shortages remain an issue at all levels. As Malta's economy is heavily reliant on tourism and services, temporary business closures during the pandemic are likely to affect overall employment levels, including those of recent graduates who have the least work experience. Difficulties in finding and retaining specialised skilled workers is one of the main challenges expressed by employers (European Commission 2020a). The significant increase (+85%) in the number of new

entrants into ICT fields between 2015 and 2018 may help better match labour market needs in the future. The Institute of Tourism Studies is working on strengthening the quality of its academic programmes, including focusing on emerging niche industries. The National Skills Council is carrying out an audit, focusing on the skills needed to boost more sustainable growth. The aim is to identify skills gaps and to collect evidence to address mismatches and better inform education policies. The results are expected in 2021. Participation in the Eurograduate survey may also help Malta tackle this challenge. The first results from the 2018 pilot show that around 28% of master's graduates have to accept, at least at the beginning of their career, a job below their own degree level. This situation does not improve substantially after five years, as 26% of the older cohort are still in this position. This vertical mismatch is a clear indication of a misalignment on the labour market, in the sense that demand for and supply of qualified labour do not correspond (European Commission, 2020b).

8. Promoting adult learning

Malta's high proportion of low-qualified adults continued to decline but the need for upskilling and reskilling remains. The proportion of adults aged 25 to 64 with low qualifications fell to 44.8% in 2019, from 46% the previous year. At the same time, in 2019 adult learning participation increased by 1.1 pps to 12%, surpassing the EU-27 average of 10.8%, but still far from the 15% ET2020 benchmark. The participation rate of low-qualified adults who are more in need of upskilling and reskilling also improved, from 4.1% in 2018 to the EU-27 average of 4.3% in 2019. The Institute of Tourism studies offers part-time courses on hospitality to make learning opportunities accessible for all. The weak engagement in adult learning by the low-qualified poses the challenge of encouraging digital learning among this highly at-risk cohort. Malta promotes adult digital learning through a number of national policies, including the national e-skills strategy 2019-2021 and the national lifelong learning strategy 2020. The Lifelong Learning Centre, the State provider of adult learning, offers courses (all accredited at national qualification levels 1 and 2), including in e-skills and computer studies, and target adults within the community.

Malta is making efforts to improve the quality of adult learning. In line with the national lifelong learning strategy 2020 and as part of the migration of adult educators' training to the University of Malta, a new diploma course in Adult Education and Training was introduced in February 2020. Among other things, the course includes a study unit dedicated to online teaching and learning. In response to the COVID-19 pandemic emergency, the Lifelong Learning Centre has switched to online learning and guidelines were published to ensure high quality. The Centre has offered all 197 academic courses through online teaching, under the care of 86 educators. This may help overcome the resistance to converting learning from traditional in-person delivery to blended adult learning courses, which represents a key challenge in the promotion of digital education in Malta.

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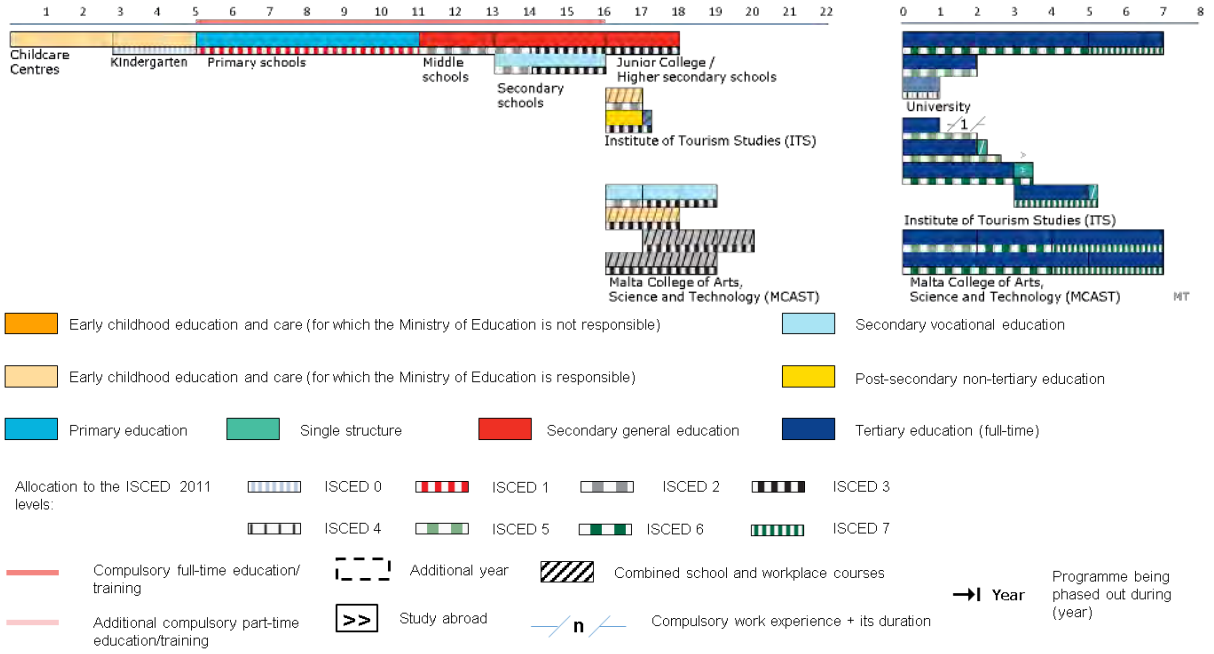
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Veronica DE NISI
Veronica.DE-NISI@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

European Commission

NETHERLANDS

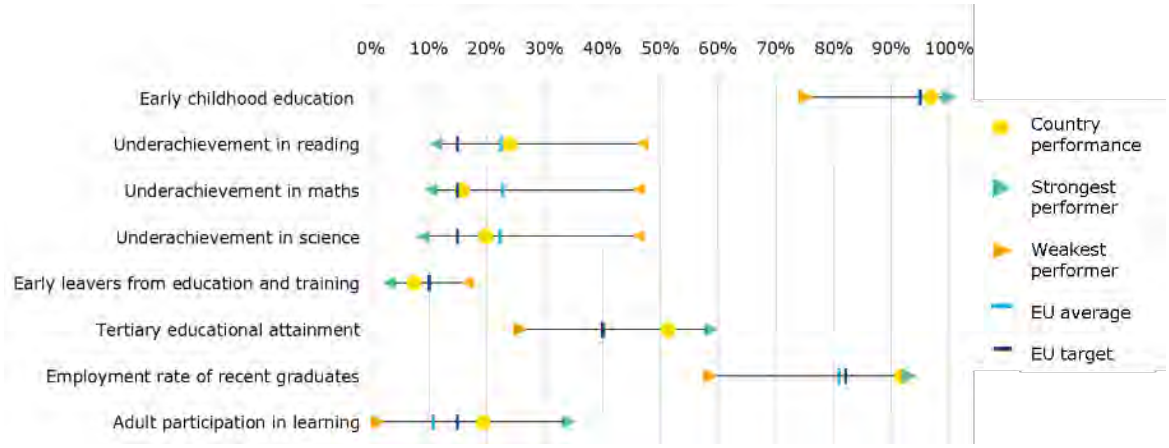
1. Key indicators

Figure 20 – Key indicators overview

			Netherlands		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			11.3%	7.5%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			38.3%	51.4%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			99.5%	96.9% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		14.3%	24.1% [18]	19.3%	22.5% [18]
	Maths		13.4%	15.8% [18]	22.2%	22.9% [18]
	Science		13.2%	20.0% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		92.3%	91.9%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		17.1%	19.5%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	2.8% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	22.5% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		5.6%	5.1% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€7 419 [12]	€7 609 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€9 409 [12]	€9 873 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€14 667 [12]	€14 139 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		11.2%	7.2%	12.6%	8.9%
	Foreign-born		13.6%	11.6%	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		39.7%	52.7%	32.0%	41.3%
	Foreign-born		30.9%	45.6%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		90.4%	88.8%	72.2%	75.9%
	ISCED 5-8		93.6%	94.0%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs; u = low reliability; : = not available; 12 = 2012, 16 = 2016, 17 = 2017, 18 = 2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Digital skills and the share of schools actively promoting digital education are above the EU average.
- There has been a decline in basic skills, and differences in performance levels between schools remain high.
- The 2019-2022 quality agreements aim to further improve the quality of VET.
- Recent measures in tertiary education aim to improve quality and ensure access.

3. A focus on digital education

Digital skills are above the EU average. According to the 2019 Digital Economy and Society Index (DESI), 92% of young people (aged 16-19) report that they have at least basic digital skills, compared to the EU-27 average of 82%. 77% of this age group claim to have advanced internet user skills, which puts the Netherlands in fifth place in the ranking. As regards ICT specialists, the Netherlands exceeds the EU-27 average at 5.0 % of total employment. In terms of internet access at home, the Netherlands ranks highest in the EU with 98% (CBS, 2019). The Index of Readiness for Digital Lifelong Learning puts the Netherlands at second place in Europe. It scores particularly well regarding institutions and policies for digital learning and availability of digital learning (CEPS, 2019).

The digitalisation agenda for primary and secondary education fosters the use of new technologies. The agenda was adopted in 2019 (OCW, 2019a) as part of the Dutch digitalisation strategy with the objective of fostering innovation in education, improving teachers' and pupils' digital skills, ensuring that IT infrastructure is secure and reliable and raising awareness of the ethics of digitalisation. There are additional related programmes such as the national training programme 'Digital Teacher', which aims to improve the digital skills of primary teachers. The programme 'Pass IT on!' (*Geef IT Door*) allows secondary schools to invite IT professionals to give a guest lecture. The government-funded centre of expertise Mediawijzer.net provides links to over 1 000 media literacy organisations to organise public campaigns, conduct research, and offer educational services. In the new national curriculum under preparation, four domains of digital literacy are addressed: information skills, media literacy, basic ICT skills and computational thinking.

Schools receive funding and professional advice to develop their ICT infrastructure. The share of digitally supportive schools at ISCED levels 1 and 2 is higher than the European average (Deloitte et al., 2019). Such schools have school strategies in place regarding the use of digital technologies in teaching and learning, and strongly promote teachers' professional development. At 35%, the share of schools that have high-speed connectivity is three times higher than the EU average (Deloitte et al., 2019). In 2017, a number of school boards in primary and secondary education established SIVON, a partnership for joint purchasing of ICT tools and services. SIVON works together with Kennisnet, the public organisation for education and ICT. Kennisnet developed a step-by-step school guide to choosing digital learning resources, and, together with school boards, created a catalogue based on information from educational publishers and providers (*Koppelpunt Catalogusinformatie*) to give schools a free, transparent and comprehensive overview of available digital learning resources.

During school closures, schools received assistance and additional funding. Kennisnet started a special service to help schools organise distance learning, plan classes and get an overview of available resources. The service also offered advice and information to parents, to accompany their children's learning at home. The government allocated EUR 2.5 million to purchase laptops for pupils who did not have the proper equipment for distance learning. In addition, a number of municipalities, NGOs and service providers offered free devices and internet access during the lockdown. Higher education institutions suspended on-site educational activities and completed the 2019-2020 academic year in distance education mode.

4. Investing in education and training

Public expenditure on education remains stable. In 2018, expenditure on primary to tertiary education accounted for 5.1% of the Netherlands' GDP, well above the EU average of 4.6%. General government expenditure on education was also higher than the EU average as a proportion of total general government expenditure (12.1%; EU-27 9.9%). In real terms, there was a 1.0% increase in education spending in 2018. Spending decreased in pre-primary and primary education by 0.8% and increased by 0.2% in secondary and post-secondary non-tertiary education and by 4.5% in tertiary education. This is linked to funding based on the number of pupils; this number has declined in primary education since 2008. The secondary school population has been in decline since 2016 (CBS, 2019).

The school-age population is becoming smaller and more diverse. The number of pupils has been shrinking in both primary and secondary education in recent years, and this trend is expected to continue (Government, 2019a). In the same period, numbers in special education (*speciaal onderwijs, so*) and in special primary education (*speciaal basisonderwijs; sbo*)[242] have been rising continuously. Migrants and native-born people with a migrant background made up 23.1% of the population in 2018. Of these nearly 4 million people, roughly 2 million are from non-western countries, almost a doubling of people with a non-western background since 1996 (MPI, 2019). In the school population around a quarter of pupils have a migrant background: 8% from a western migrant background and 18% from a first- or second-generation non-western background (Education Inspectorate, 2020a). Diversity is likely to increase further, as the share of pupils with a migrant background among new entrants is around 30%.

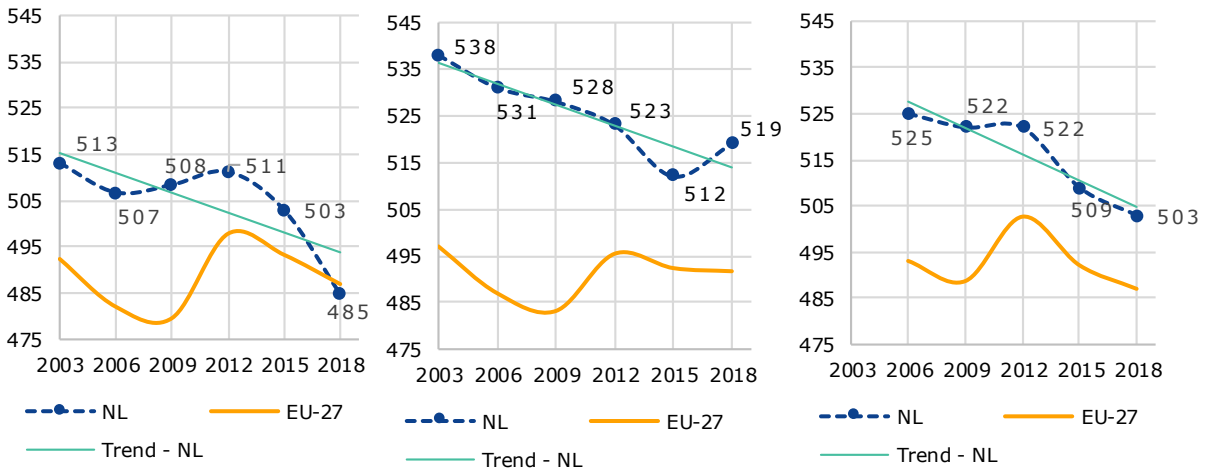
5. Modernising early childhood and school education

Participation in early childhood education (ECE) is high, and recent investment aims to improve quality and participation time. From age four, 96.9% of children participate in ECE, compared with an EU average of 94.8%. In 2018, 56.8% of children under three attended childcare (EU average 34.7%). For 2020, the government made an extra EUR 170 million available to improve ECE quality (OCW, 2018a). The objectives are to increase the number of participation hours to 960 for children aged over 18 months (corresponding to 16 hours/week), raise the qualification level of ECE staff to tertiary level, evaluate equal educational opportunities and support municipalities and ECE providers working to reduce educational disadvantages.

There has been a decline in basic skills as measured in the OECD Programme for International Student Assessment (PISA). In 2018, Dutch students achieved the second highest mean score in mathematics in the EU, and their performance in science was also significantly above the EU average. Mean performance in reading (485), however, was at the lowest level ever observed and for the first time below the EU-27 average (487). Over the long term, a downward trend in mean scores can be observed in all three domains (Figure 3). The share of top performers (Level 5 or 6) in science and mathematics is above the EU average but has been in decline in all three domains since 2009. The share of underachievers is close to the EU target of 15% in mathematics (15.8%; EU 22.9%) but above in science (20%; EU 22.3%) and especially in reading (24.1%; EU 22.5%).

[242] Special primary schools are regular schools for children with a relatively low level of intelligence; children who have a learning disability or children who have behavioral problems. *Sbo* pupils are expected to reach the same knowledge level by the end of school as pupils in an ordinary primary school, but they may take longer.

Figure 3 - Trends in performance in reading, mathematics and science, in PISA mean score, 2003-2018



Source: OECD (2019), PISA 2018 Database.

A majority of students with a migrant background are underachievers and differences in performance levels between schools remain high. The proportion of low achievers is especially high (56%) among pupils born abroad. Native-born pupils with a migrant background only partially catch up. Differences between schools have the strongest impact on pupils' performance of all EU countries, reflecting ability-based tracking from an early age. The impact of socio-economic background on pupils' performance is at the EU average.

Students are happy with school but bored with reading. Most students feel they belong at school (76%) and the share of those reporting bullying (12%) was the lowest in the EU. Looking at the subskills within reading, Dutch students score well on searching for information but less so on reflection and evaluation. They are the least motivated readers in the OECD: about 60% only read when necessary or to look up information. Almost half report that they find reading a waste of time, a lack of motivation confirmed by national surveys. The Education and Culture Councils made recommendations on how to make students read more and better in June 2019 (Education Council, 2019a).

The rate of early school leaving (ESL) is below the Europe 2020 national target but has increased recently. The Netherlands' Europe 2020 target for the rate of early school leavers was 8% by 2020: this was achieved in 2016. The slight increase in 2018 continued in 2019, and now stands at 7.5% (EU average 10.2%). The Netherlands set another related national target: to reduce the number of young people leaving education without a basic qualification during the school year to below 20 000. This number started rising in 2016/2017, reaching 26 894 in 2018/19 (Onderwijs in cijfers, 2020). The aim to reduce it to a maximum of 20 000 by 2021 therefore seems less achievable than before. An amendment to the Act on Education and Vocational Education in June 2018 made cooperation between schools and municipalities to combat ESL compulsory (Government, 2018). There are three main preventative measures. First, the Government provides EUR 80 million to the regions to implement measures agreed with schools and municipalities. Second, there is a performance-dependent funding scheme through which secondary schools with low dropout rates receive extra remuneration. The funding pot available is over EUR 17 million. Finally, since 2019, VET secondary schools (MBO) need to include plans for tackling early school leaving in their quality agreement, based on which they receive funding. In February 2019, the Education Council published recommendations to prevent school failure (Education Council, 2019b). One of these was to integrate the pre-vocational (VMBO) and vocational (MBO) tracks to reduce the number of transitions, as these are linked to a high risk of dropping out.

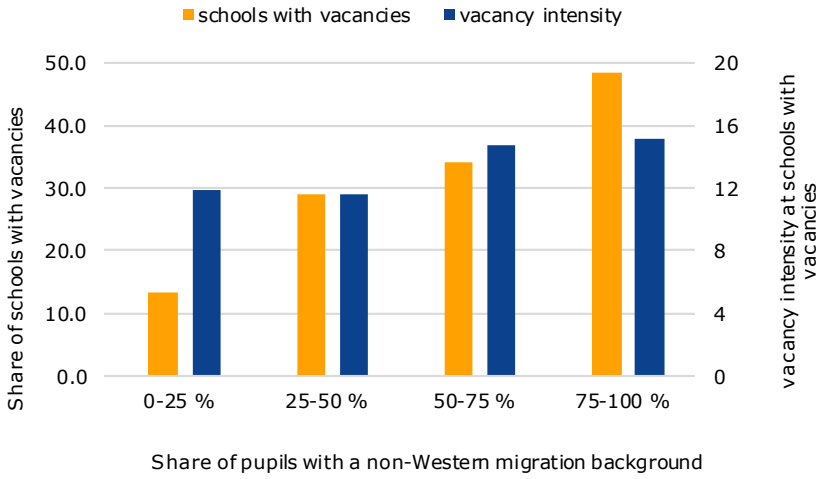
Efforts have been intensified to combat absenteeism. In 2016, a Home Stayers' Pact (Government, 2016) was signed between the government, school boards in primary and secondary education and the national association of municipalities to reduce the number of home stayers. These are pupils under a schooling obligation who have stayed away from school for more than 3 months without a valid reason. Despite all efforts, the number of such pupils had increased to 4 790 by the end of 2019. An 'acceleration agenda' has been concluded by the Pact partners: actions include making binding the rulings of the 'Fitting Education' (*Passend Onderwijs*) Disputes Committee on the placement of pupils in appropriate education settings. The Ministry of Education also intends to provide improved information to parents and to strengthen the care duty of schools. As of November 2019, compliance with the care duty is part of the 4-yearly school evaluation by the Education Inspectorate.

Fragmentation of the school system presents a risk to equity. Differences between schools in the Netherlands have the highest impact on pupil performance of all EU countries. This means that the achievements of individual pupils are closely linked to the choice of the school and its educational track. Schools may choose a curriculum with a specific profile such as science, culture or media literacy, or a special education concept such as Montessori or Agora education. The number of such special profile schools has increased sharply since 2000, especially in secondary education (Education Inspectorate, 2019). The Education Council has warned against increasing fragmentation, on the basis that it may lead to greater segregation and narrowing of learning paths (Education Council, 2019b). In 2019, the Ministry made additional funding available for local or regional projects promoting equity in education. Eligible activities include training primary school teachers about the orientation advice that determines pupils' school career, developing innovations in education, activities to increase the involvement of lower-educated parents in the education of their children, and coaching and career orientation for pupils with less educated parents. In total, funding of EUR 3 920 million was earmarked for 2019 and EUR 3 080 for 2020.

The Netherlands faces an increasing shortage of teachers. The teacher shortage at primary schools is projected, on current trends, to reach 8 000 full-time equivalents in 10 years (Government, 2019b). 35% of all primary teachers are aged 50 or over, and only one in three teachers works full-time. Teacher shortages will be highest (9.5%) in the 'Randstad', covering the four largest cities (Amsterdam, Rotterdam, The Hague and Utrecht) and their surrounding areas (Education Inspectorate, 2020). Outside the Randstad the average teacher shortage will be 2.5%. In December 2019, the government announced a series of measures to reduce teacher shortages (Government, 2019c). These include investment in combating shortages in the Randstad, extra funding for continuing professional development and to reduce the workload of teachers, investments in teachers' initial education, and mentoring at the start of the career. In its formal advice of 2018, the Education Council proposed more flexible structures in initial teacher education and working arrangements that support continuing professional development within schools. The Council also recommended offering specialisations in teaching a particular age group and qualifications covering a number of educational sectors and subject areas. Following the advice, the government set up an expert committee at the end of 2019 to produce plans on how to change the qualifications system.

The distribution of qualified teachers varies markedly by region and by composition of the school population. In primary education, teachers with a master's degree teach more often in schools with a high percentage of students with high-educated parents. The share of teachers from a non-western migrant background is only 3.7% (Education Inspectorate, 2020) and they tend to teach in schools with more students from a similar background. Shortages are more acute in schools where the majority is of a non-western background: in 2017/2018, 13% of schools with 0-25% students from a migrant background were looking for teachers through job sites, compared with 48% of schools with 75-100% of pupils from a migrant background (Figure 2). The percentage of lessons taught by unqualified teachers is higher in pre-vocational secondary education (VMBO) than in general upper secondary education (HAVO and VWO).

Figure 4 - Differences between primary schools in their search for teachers, in percentage, 2018



Source: Dutch Education Inspectorate, 2019.

Curriculum revision remains on the agenda. In 2015, the Ministry of Education established an advisory commission, 'Platform Onderwijs2032', to reflect on the future of education and make recommendations for reform. The commission initiated a nationwide dialogue on the compulsory education curriculum. Based on the public consultation, the Platform presented a proposal in 2016. In 2018, almost 150 teachers and school leaders started working in teams on nine learning areas, with the aim of proposing a general concept and building blocks for each area by autumn 2019. The Minister of Education submitted an opinion on these proposals to Parliament in late 2019. In discussions in March 2020, Parliament was divided over the continuation of the curriculum revision in its current form. It was agreed that a temporary scientific committee should be set up to manage the next steps (OCW, 2020a). The committee will bring together field specialists and curriculum experts to develop new core objectives for primary and secondary education.

Special measures were taken to reduce the adverse impact of school closure linked to the COVID-19 pandemic between March and May. In April the Education Inspectorate carried out a representative survey among primary schools on how they managed distance education (Education Inspectorate, 2020b). 94% of schools reported that the switch went well. In 84% of schools almost all pupils participated to 100%; in 14% of schools this share was 75%. Main obstacles to participation were limited support from parents, difficulties with autonomous work and poor language skills. In June a subsidy was created for schools to organise extra-curricular support programmes for pupils who accumulated a learning deficit during the lockdown (OCW, 2020b).

6. Modernising vocational education and training

Graduates from vocational education and training (VET) fare well on the labour market. 90.4% of recent VET graduates had a job in 2019, one of the highest rates in the EU, where the average is 79.1%. According to an employers' survey, demand for professionals with a secondary VET qualification even surpassed that for tertiary graduates (UWV, 2019). More than half of the vacancies required professionals with a secondary vocational training qualification while one third required high-skilled people. The share of VET pupils from the total upper secondary school population is high, at 67.5% in 2018 (EU average 48.4%).

The 2019-2022 quality agreements aim to further improve the quality of VET provision. The Macro-effectiveness Act adopted in 2015 aimed to improve the match between VET programmes and labour market needs (OECD, 2018). The law encourages schools to cooperate instead of competing with each other, to prevent multiple schools in the same area from offering similar tracks. Before launching new educational programmes, schools are required to coordinate their plans. The 2018 quality agreements allow each vocational secondary school (mbo) to frame their own strategy and priorities for 2019-2022, in consultation with regional partners (OCW,

2018b). Funding of approximately EUR 400 million a year was earmarked for quality agreements, of which 25% is performance-based. As of 2019, vocational and general secondary schools can apply jointly for a subsidy to tackle shortages of teachers in their region (Government, 2019c). Subsidies may reach EUR 250 000 per region, and can be increased by up to EUR 75 000 if one or more VET schools are involved.

New measures aim to improve the legal situation of VET students. In a new bill the term 'participant' is replaced by 'student', giving VET students similar rights as for tertiary students. The proposal also introduces a 'VET declaration' (*mbo verklaring*) for early school leavers, to validate the competences acquired before leaving the programme. This should help them find a job. Another novelty of the bill is the 'VET student funds', a pool created by each VET school from their central financing to support disadvantaged students at risk of dropping out.

A subsidy scheme was introduced to support the joint development of flexible VET programmes in 2019. This aims to stimulate public and private secondary VET institutions to jointly develop flexible vocational programmes for the 'third learning pathway', corresponding to the needs of employees and job seekers. Such programmes are tailored to the target group in terms of duration and the number of training hours. EUR 20 million is available over 4 years for the development of innovative programmes, working methods and materials addressing regional skills needs that can also be used in other VET programmes.

Box 1: The Twente Fund for Craftmanship

Budget: Total EUR 8.3 million of which EUR 0.5 million from ESF

Duration: January 2019 – December 2022

Implementing body: Leerwerkloket Twente in cooperation with Loopbaanstation

The Twente Fund for Craftsmanship is a collaboration of entrepreneurs, educational institutions, public employment services and local and regional governments. The Fund supports employed or self-employed people and job seekers wishing to develop and acquire new skills in any area of vocational training.

The Fund pays a maximum of EUR 5 000 per training course per participant.

Participants: In May 2020, a total of 2 667 applications were received, of which 747 were granted, from over 14 municipalities and 14 different fields of education.

www.twentsfondsvoorvakmanschap.nl and http://www.ikbindr.nl

7. Modernising higher education

Tertiary attainment and graduate employment rates are well above the EU average. 51.4% of the population aged 30-34 holds a tertiary degree (EU average 40.3%). The attainment rate among the EU-born population from outside the Netherlands (53.4%) surpasses that of the native population (52.7%) and it is also relatively high among the non EU-born (42.1%; EU average 34.2%). The employment rate of recent tertiary graduates was very high: 94.0% in 2019 (EU average 85.0%).

The first 15 quality plans were approved in 2019 (OCW, 2019b). In 2014, the previous partly grant-based student finance system was replaced by low-interest loans provided by government. The aim was to invest the savings resulting from this reform in the quality of tertiary education. In 2018, the Minister of Education, Culture and Science signed an agreement with the Association of Research Universities, the Association of Universities of Applied Sciences and student organisations about shaping the quality agreements for 2019-2024, which link the release of the performance-related part of the budget for each higher education institution to approval of their quality plan. The plans of all 54 institutions were assessed by the Accreditation Organisation of the Netherlands and Flanders (NVAO) in the first half of 2020. The quality plans are linked to EUR 2.3 billion of funding in the years 2019-2024.

The 2019 Language and Access bill aims to cap tuition fees to ensure studies remain accessible to Dutch students. The steadily increasing share of foreign students raised concerns about the accessibility of tertiary education to native students. In order to attract foreign students, a growing number of degree programmes are offered in English, especially at master's level (three quarters of programmes). One in five students starting a university bachelor's degree is a non-national. In master programmes, this share rises to almost 30% (Education Inspectorate, 2019). Students following a second bachelor or master programme after completing a first one, and students from outside the European Economic Area (EEA), need to pay an institutional tuition fee. The fee is determined by the institution and may not be lower than the statutory tuition fees for first study programmes. The proposal would cap the institutional tuition fee for Dutch and EEA students at around the level of the minimum tuition fee for students from outside the EEA (Government, 2019c).

8. Promoting adult learning

Overall participation in adult learning is high and specifically encouraged among low-skilled people. 19.5% of adults have had a recent learning experience, compared with the EU average of 10.8%. However, low-skilled workers participate in learning activities much less frequently (at 9.9 %), increasing the risk that their skills will become outdated. To encourage adult learning, the government established the Work Position Incentive (*Stimulans Arbeidsmarktpositie; STAP*) budget. This offers a personal development budget of up to EUR 1 000 per year for individuals with or without a job as of 1 January 2022. Another large scale initiative addresses adult illiteracy. In March 2019, the government earmarked EUR 425 million for the 'Count with language' programme for 2020-2024, an increase of EUR 35 million over 2015-2019. The aim is to reach out to illiterate Dutch native speakers and promote digital skills. The Language Accord for Employers, implemented by UWV/Leerwerkloketten, aims to support employers by improving the basic skills of their employees and to make basic skills part of their HR policy (STVDA, 2019).

Box 2: Adults receive support to develop their digital skills.

The government launched the digital government programme in 2017 to encourage people to manage as many things online as possible. To make online services accessible to all, the government invests in identifying people with low basic and digital skills and provides them with learning support. Every year, municipalities receive about EUR 60 million to address learning needs in language, mathematics and, since 2018, digital skills. In 2015, the National Library of Netherlands started the programme 'Library and Basic Skills' which builds on the role of libraries as non-formal education and information centres for people who find it difficult to deal with e-government. In 2019, a network of Government Digital Service Information Desks was created in public libraries across the country. Since then, libraries not only offer ICT skills training but also serve as the first point of information service about e-government.

https://www.bibliotheekenbasisvaardigheden.nl/

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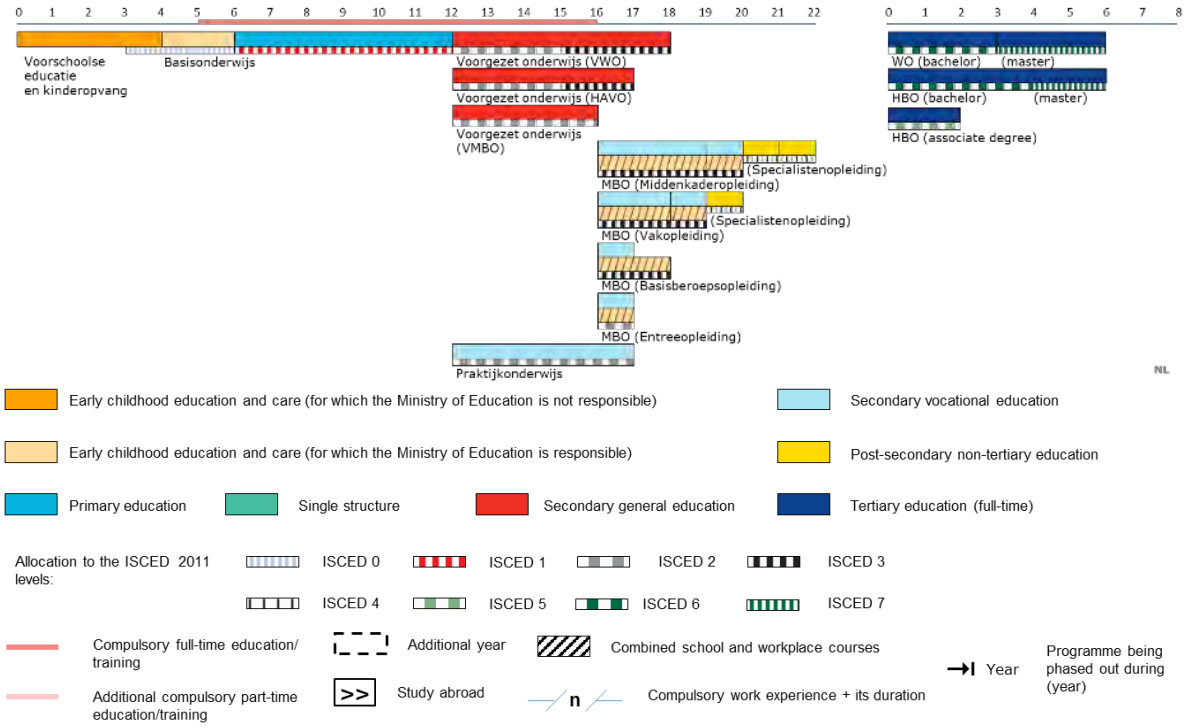
UWV (2019): Uitvoeringsinstituut Werknemersverzekeringen: *Moeilijk vervulbare vacatures.* https://www.uwv.nl/overuwv/Images/moeilijk-vervulbare-vacatures-2019.pdf

Volkskrant (2020): *Hoog verzuim onder basisschoolleerlingen uit arme gezinnen uit angst voor coronavirus.* https://www.volkskrant.nl/nieuws-achtergrond/hoog-verzuim-onder-basisschoolleerlingen-uit-arme-gezinnen-uit-angst-voor-coronavirus~bd48bd84/?referer=https%3A%2F%2Fwww.google.com%2F

Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Livia RUSZTHY
Livia.RUSZTHY@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

European Commission

POLAND

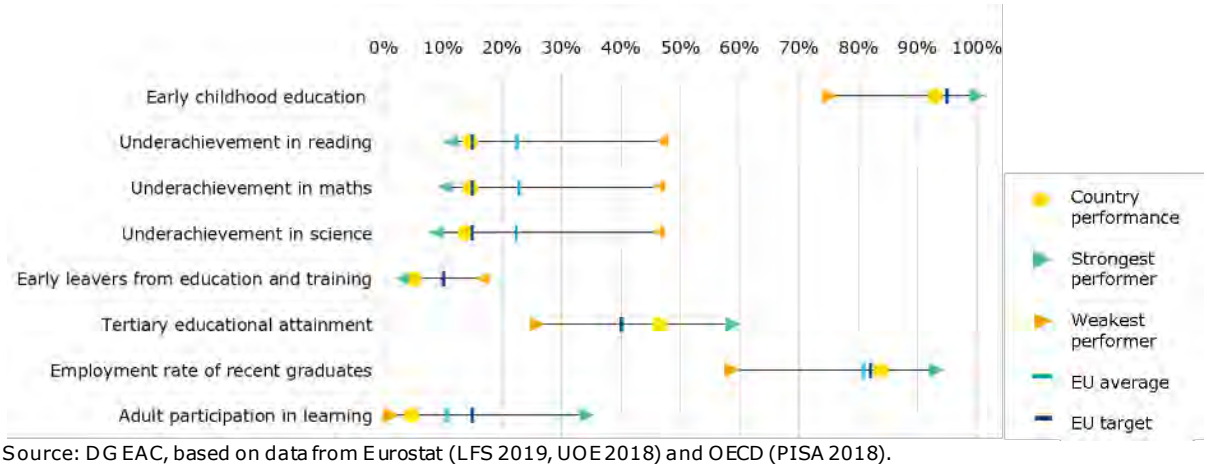
1. Key indicators

Figure 21 – Key indicators overview

			Poland		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			5.3%	5.2%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			32.8%	46.6%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			70.9%	93.0% e, 18	90.3%	94.8% 18
Proportion of 15 year-olds underachieving in:	Reading		15.0%	14.7% 18	19.3%	22.5% 18
	Maths		20.5%	14.7% 18	22.2%	22.9% 18
	Science		13.1%	13.8% 18	17.8%	22.3% 18
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		78.4%	84.0%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		4.7%	4.8%	7.9%	10.8% b
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	1.2% 18	:	4.3% 18
	Credit mobile graduates (ISCED 5-8)		:	1.2% 18	:	9.1% 18
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		5.4%	5.0% 18	5.1%	4.6% 18
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€4 943 12	€5 409 17	€6 072 d, 12	€6 240 d, 16
		ISCED 3-4	€4 519 12	€4 844 17	: 12	€7 757 d, 16
		ISCED 5-8	€6 537 12	€7 188 17	€9 679 d, 12	€9 977 d, 16
Early leavers from education and training (age 18-24)	Native-born		5.3%	5.2%	12.6%	8.9%
	Foreign-born		:	: u	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		32.8%	46.4%	32.0%	41.3%
	Foreign-born		: u	61.3%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		68.7%	77.3%	72.2%	75.9%
	ISCED 5-8		85.7%	90.1%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs, e = estimated, u = low reliability, : = not available, 12 = 2012, 16 = 2016, 17 = 2017, 18 = i2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Poland has met the ET 2020 benchmark on low underachievement in reading, maths and science, and also performs strongly on tertiary attainment and low early school leaving rates.
- Challenges in adjusting to the new school system were intensified by the sudden switch to distance learning due to COVID-19.
- Higher education institutions are implementing reform and preparing for the first evaluation based on new principles. Vocational reform is also progressing.
- The digital skills of adults are low and adult learning remains limited.

3. A focus on digital education

Digital skills are promoted in broader national strategies, but there is no focused digital education strategy. The 2020 strategy for responsible development[243] envisages strengthening the school curricula with innovative skills, including information and communication technologies (ICT), adjusting higher education to the needs of the labour market and embedding new digital solutions in education. The integrated skills strategy up to 2030[244] includes actions to improve the use of digital technologies and combat digital exclusion. Research shows, however, that the successful integration of digital technologies into education and training requires an overall policy vision, organisational change, leadership and, in particular, support for teachers (Conrads et al., 2017). Experts have recommended developing a comprehensive digital skills strategy covering school and adult education, digital talent and e-inclusion (Tarkowski et al., 2018). The new digital competences development programme up to 2030, which is coordinated by the Ministry of Digital Affairs, focuses on the digital skills needs of citizens, ICT specialists, SME employees and public administration[245]. In 2020, Poland received a country-specific recommendation from the Council of the EU to 'improve digital skills' (Council of the EU, 2020[246]).

The new curriculum aims to enhance students' digital skills. In 2019, 51% of 16-19 year-olds reported having above-basic overall digital skills (EU 57%)[247]. Poland showed the highest increase in the EU, by 19 pps, since 2015. At the same time, only around half of those aged 18-30 think that education has equipped them with the right skills, including digital competences, for their careers[248]. From 2017, the new computer science core curriculum includes programming from the first grade of primary school and, at later stages, introduces competences such as analysing and solving problems based on logical and abstract thinking, algorithmic thinking and information representation (European Commission/EACEA/Eurydice, 2019).

Improving the use of digital technologies in teaching requires specific support measures. Although 90% of teachers state that they use digital technologies in teaching, research shows that they usually use presentations or interactive boards, while still conducting classes via traditional transmission methods (Plebańska, 2017). Only around 12% of students use the internet during lessons, and mainly engage in simple online activities (Pyżalski et al., 2019). Experts recommend a new approach to supporting teachers, equipping them with the skills to use digital content and educational services more interactively (Głomb et al., 2019). Poland continues to support teachers in ICT, also using EU funds (Box 1). The evaluation report of European Social Fund (ESF) support for ICT training for teachers since 2008 suggests the following key drivers for improvement:

243 https://www.gov.pl/web/fundusze-regiony/informacje-o-strategii-na-rzecz-odpowiedzialnego-rozwoju

244 https://efs.men.gov.pl/zintegrowana-strategia-umiejetnosci-2030-czesc-ogolna/

245 https://www.gov.pl/web/cyfryzacja/kompetencje-cyfrowe

246 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0521&from=EN

247 Eurostat: [isoc_sk_dskl_i].

248 https://media30.pl/portfolio-item/rozwoj-kompetencji-cyfrowych-z-fundacja-media-3-0/

i. greater availability of ICT infrastructure in schools;
ii. improving teachers' competences;
iii. ensuring qualified technical staff;
iv. ensuring equal access to education for students with special educational needs (Bieńkowska, Z. et al., 2019).

Given the high expectation that teachers should engage with technology, training needs are high (Czapliński, et al., 2020).

Although progress has been made in schools' digital infrastructure, secondary schools still lag behind the EU. Over the years, projects financed by the government, European Structural and Investment Funds and the private sector have improved schools' connectivity, digital infrastructure and teaching aids. The Polish Educational Network project (OSE[249]) launched in 2017 aims to connect schools to the internet and create a digital education network by the end of 2020. In 2018, 37% of primary school students (EU 35%), 39% of lower secondary school students (EU 52%) and 51% of upper secondary school students (EU 72%) attended schools which were highly digitally equipped and connected (European Commission, 2019a). In mid-March, all education and care institutions closed due to COVID-19, and 2 weeks later pre-schools and schools began providing distance learning[250], facilitated by the swiftly upgraded online educational platforms[251]. To prevent digital exclusion, the government allocated *around EUR 81 million to local governments to purchase ICT equipment for disadvantaged pupils, and for schools and teachers under the operational programme 'Digital Poland', and intensified investment efforts under OSE (both supported by the European Regional Development Fund (ERDF)) (see Volume 1).*

Box 1: European funds support training for teachers in new technologies

'Lesson: Enter' is the largest nationwide digital education project. Its main goal is to train and encourage teachers to use digital content and tools more often The project includes 40 hours of training designed according to individuals' needs, subjects and school levels. Study visits, networking and exchanges, and regional meetings are also provided. Around 15% of the teaching workforce (75 000 teachers) is to be trained in 2019-2023. Public and private regional teacher training centres can participate and draw on the project's curricula, lesson plans and webinars for their own programmes. It is expected that their involvement and that of other regional stakeholders will ensure sustainability of the activities. The project is implemented by three non-profit organisations: the Orange Foundation (leader), the Information Society Development Foundation and the Institute of Public Affairs *http://www.isp.org.pl/* with a grant of EUR 12.5 million under the Operational Programme (OP) 'Digital Poland' (ERDF). *Additionally, online training of teachers in distance teaching* will be supported with ca. EUR 11 million from the ESF under OP 'Knowledge, Education, Development' (OP KED).

See: www.lekcjaenter.pl ; https://www.ore.edu.pl/2020/09/wsparcie-nauczycieli-w-prowadzeniu-ksztalcenia-na-odleglosc-informacje-o-projekcie-2/

4. Investing in education and training

While investment in education is high compared to other EU Member States, spending per pupil remains low. Poland spent 5.0% of its GDP on education in 2018 (EU 4.6%) and 12.0% of total government expenditure (EU 9.9%). Education spending has grown significantly: in 2010-2018, public expenditure on education overall increased in real terms by 13%, and from early childhood education and care up to upper secondary levels it grew in real terms by 17.92%[252] (i.e. by EUR 2 233.1 million). This included the costs of the school system reorganisation. Nevertheless, in 2017, annual spending per student for all education levels remained low compared to other

249 https://ose.gov.pl/
250 https://www.gov.pl/web/edukacja/ksztalcenie-na-odleglosc--nowe-regulacje-prawne
251 www.epodreczniki.pl ; https://www.gov.pl/web/zdalnelekcje
252 Eurostat, COFOG: [gov_10a_exp].

Member States[253]. The very good results of Polish 15-year olds in the OECD Programme for International Student Assessment (PISA) 2018 coupled with this comparatively low spending per pupil indicate that the system is efficient. However, low spending per pupil largely reflects low teachers' salaries, and teachers' enthusiasm is among the lowest in the EU (OECD, 2019b Vol. III) with shortages emerging. In 2019, teachers' average actual salaries were 63% of the earnings of other tertiary-educated workers at pre-primary level (ISCED02), 75% at primary level, 76% at lower secondary level and 75% at the upper secondary level, well below the averages (between 80-94%) for OECD countries (OECD, 2020). Efforts have been made to improve the financial attractiveness of the profession: following an increase of salaries by 14.6% for all teachers and further increases for starting and class teachers in 2019, budget 2020 envisages to increase the minimum teacher salary by 6% from September.

Discussions regarding financing education continue. According to the Statistical Office's data the share of spending borne by local governments has been increasing faster than the central government subsidies (Statistics Poland, 2019a). This is, however, seen differently by the Ministry. The impact of COVID-19 is likely to further affect the local government budgets. Discussions between the central and local government on these issues are ongoing[254], [255].

5. Modernising early childhood and school education

The ECE participation rate is close to the EU average but both coverage and quality of provision vary. In 2018, the participation rate of children aged 4+ in pre-school education in Poland was 93% (EU 94.8%), having increased by 16.7 pps since 2010. Since September 2017, children aged 3-5 have a legal entitlement to pre-school education, yet the participation rate of children 3+ was still only 88.2% in 2018 (EU 92.2%). An assessment by the Supreme Audit Office found that access to pre-school education is not fully ensured for ages 3-5. Provision is weaker in rural areas and there are concerns over the quality of services and the transparency of recruitment processes (NIK, 2019). In an effort to boost quality, from 2019/2020 future pre-school and early education teachers follow a 5-year master's course.

Enrolment of children under 3 is low and faces various barriers. In 2018, the enrolment rate was 10.9% (EU 34.7%). The Ministry of Family, Labour and Social Policy continues to support expanding places for such children under the Toddler+ programme launched in 2011; the government's strategy for responsible development envisages 33% participation by 2030. The Ministry acknowledges barriers to reaching this goal: a shortage of places, a low proportion of municipalities with childcare facilities, and high costs for parents (MRPiPS, 2019). The assessment carried out in preparation for a possible child guarantee scheme indicated the need for: flexible forms of childcare; actions to increase participation of children from recent refugee and migrant families; and better quality of service for children with disabilities and other special needs (Frazer et al., 2020).

Poland continues its high performance in basic skills. According to PISA 2018, 15 year-olds ranked among the best in the EU in reading, mathematics and science. Performance improved in all three testing areas since 2015, with a particularly positive long-term trend in reading and mathematics (OECD, 2019a). The proportion of low achievers has decreased; in 2018, Poland was one of four Member States to meet the ET2020 benchmark in all three areas (reading 14.7%, mathematics 14.7%, science 13.8%). In 2009-2018, the proportion of top-performing students in reading increased by 5 pps to 12.2%, and in 2018 was above the EU-27 average in mathematics (15.8%) and science (9.2%). The proportion of top performers in all three areas was among the highest in the EU (5.3% v 3.4%) (Figure 3) (OECD, 2019b Vol. I). This sustained high performance indicates that the reforms implemented in 1999-2019 have both reduced the number of low achievers and supported high performers. Experts underline a number of challenges still to be addressed: the demotivation of teachers; the need to support students from disadvantaged backgrounds; and the need to update the education process in line with changing needs in an

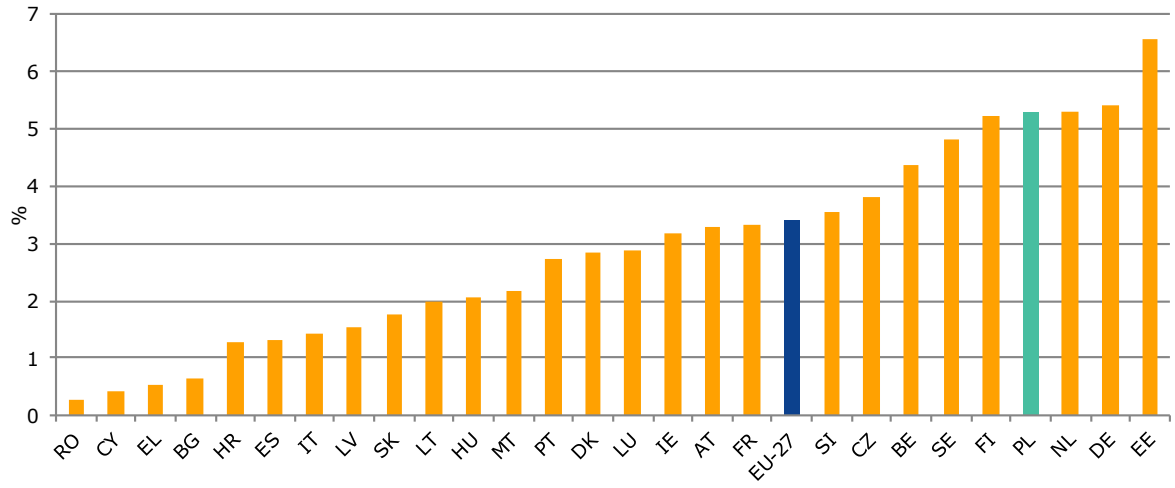
253 Eurostat, UOE: [educ_uoe_fini04].

254 https://www.gov.pl/web/edukacja/posiedzenie-komisji-wspolnej-rzadu-i-samorzadu-terytorialnego

255 https://www.metropolie.pl/pl/7796,7796/

increasingly digital environment (Sitek & Ostrowska, 2020). Since the 2016 law fundamentally changed the school system and curricula, it will be necessary to closely monitor educational outcomes.

Figure 3 - Percentage of top performers in all three domains (reading, mathematics and science), PISA 2018

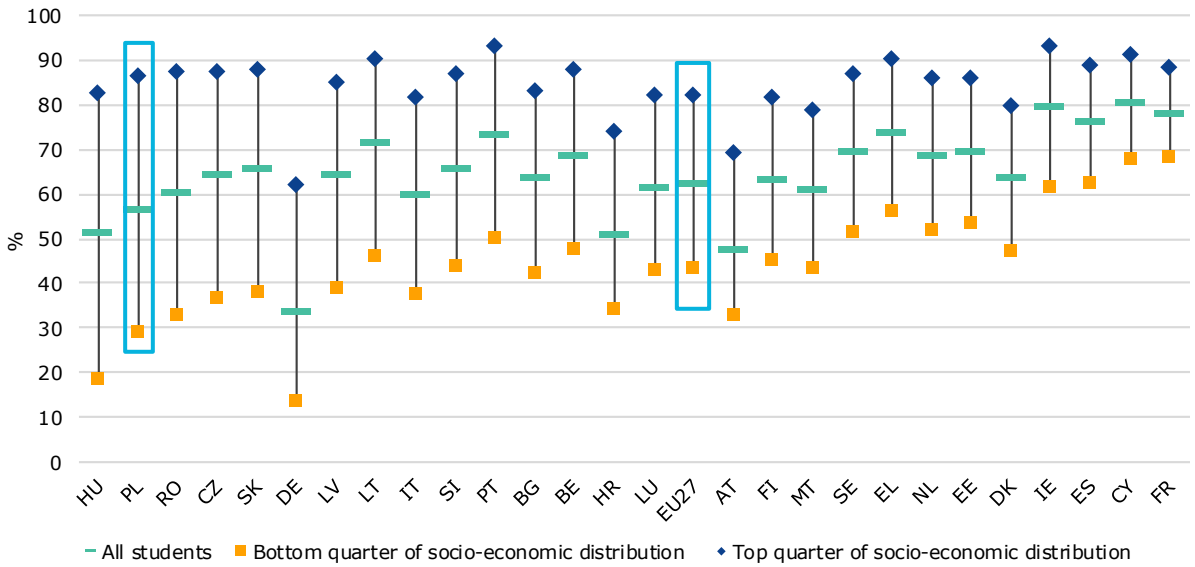


Source: OECD 2019b, PISA 2018

Socio-economic background has a relatively low influence on PISA results but impacts strongly on pupils' academic ambitions. Boys' reading performance significantly improved in 2009-2018; the gender gap in favour of girls narrowed from 50 to 33 score points. In mathematics and science, girls scored similarly to boys. The impact of socio-economic status (11.6%) is relatively limited and below the EU-27 average (14.2%), and the variation between advantaged and disadvantaged schools is also below the EU-27 average (81 v 137 score points) (OECD, 2019b, Vol. II). However, socio-economic background strongly affects academic ambitions: only 29.3% of pupils from the lowest socio-economic cohort planned to complete tertiary education (EU-27 43.4%) and 47% of high-performing students from disadvantaged backgrounds did not intend to do so. In contrast, 86.5% of pupils from advantaged groups planned to do so (EU-27 82.3%), and only 8.4% of high-performing advantaged students did not (Figure 4). This finding points to a persistent risk of intergenerational transmission of poverty, as lower-education perpetuates the risk of lower earnings and higher unemployment[256]. Although education and career guidance is obligatory to all students, disadvantaged students may need more appropriate support regarding their education and career choices. A relatively low proportion of disadvantaged schools provide career guidance in Poland (51.3%) (OECD, 2019b, Vol. II).

[256] European Commission (2018). Employment and Social Developments in Europe 2018.

Fig. 4 – Percentage of 15-year-olds who expect to complete tertiary education, by socio-economic status, 2018



Source: OECD (2019b), PISA 2018. Countries are ordered from the biggest to the lowest gap between students in the top and bottom quarters.

School climate and students' well-being require attention. In 2018, the proportion of students who reported that they belonged at school (60.8%) was lower than the EU-27 average of 65.2%, and the proportion who reported being bullied at least a few times a month increased by 5.27 pps to 26.4%. Bullying is particularly common among low-achieving students (36.3% v 21.2% for high achievers). Improving the school climate could enhance students' academic ambitions and attitudes to learning later in life, as negative educational experiences are one of the barriers to adult learning (Ministry of National Education, 2019).

The rate of early school leavers remains low at 5.2% in 2019. In 2009-2019, the level of early leavers from education and training fell by 0.1 p.p.). It is particularly low in cities (4.0%), and fell also in rural areas by 1.2 pps to 5.6%, while increasing in towns and suburbs by 2.1 pps to 6.3%. Regional variations persist: the highest rate is in Northern Poland (7.5%), while the lowest is in Southern Poland (3.2%)[257].

While they were adjusting to the new education system, schools faced the additional challenge of suddenly switching to distance learning due to the COVID-19 crisis, which created additional challenges. Schools started fully implementing the changes introduced by the 2016 law[258] in 2019/2020 which created challenges related to the increased number of students in primary and secondary schools, new curricula and homework burdens (European Commission, 2019b). While measures to support distance learning were swiftly implemented, notably provision of additional ICT equipment, e-materials, online platforms, and guidance for teachers and parents, the COVID-19 crisis revealed that there are still groups of students at risk of educational exclusion (RPO, 2020). A survey[259] among school heads undertaken a month after distance learning was launched showed that 85% of surveyed schools were able to provide distance learning, although relying largely on their own resourcefulness, and that there was a digital divide affecting both students and teachers. School heads also indicated a need for psychological support for students, teachers and parents. At the end of the school year, 87% of surveyed teachers had learnt how to use digital teaching tools, but only 10% felt fully prepared for online teaching (Fundacja Orange,

257 Eurostat, LFS: [edat_lfse_16].

258 The reform of lower and upper secondary schools introduced by the Law on School Education of December 2016 for implementation between 1 September 2017 and the school year 2022/2023.

259 https://lekcjaenter.pl/uploads/RAPORT_Dyrektorzy%20do%20zadań%20specjalnych.pdf

2020). The crisis prompted an expert discussion resulting in a series of 'Educational Alerts'[260] discussing *inter alia* digital skills and education, digital exclusion of pupils, the quality of teaching at all levels, and the financing of education. Building a broad consensus with social partners, teacher unions, parents and student organisations on teaching content, including digital and social competences, is seen as key to ensuring that the high quality of education can be maintained.

Poland continues measures to improve inclusive education. With the assistance of the European Commission's Structural Reform Support Programme, the Ministry of Education continues its efforts for better integration of students with disabilities into mainstream education. The new regulation[261] on initial teacher education standards and qualifications puts stronger emphasis on practical training and on supporting students with special educational needs. The European Agency for Special Needs and Inclusive Education is helping the Ministry prepare new legislation drawing on evidence from within and beyond Poland. Numerous workshops and a national conference were held. Poland continues to implement projects to improve inclusive education, including with ESF support[262]. The number of foreign-born students in Polish schools more than doubled in 2017-2019, reaching almost 58 000 (Statistics Poland, 2019a), requiring additional efforts to ensure their integration.

6. Modernising vocational education and training

The implementation of the vocational education and training (VET) reform is ongoing. In February 2019, a new regulation was adopted defining core curricula for all occupations in a new classification, including additional vocational skills for selected occupations. In 2019, the Ministry of National Education published the first forecast of demand for employees in vocational occupations. In 2020, local governments will receive increased state subsidies for VET learners in high-demand occupations identified in the forecast. In 2019, the employment rate of recent graduates at ISCED 3-4 level was 77.3% (EU 75.9%).

The activities of vocational schools were restricted due to COVID-19. Distance learning primarily covered theoretical vocational subjects and the practical content which could be implemented remotely. Technical and post-secondary school students completed their apprenticeships in the school year 2019/2020 and employees (students of sectoral schools) will be able - in agreement with the employer - to take practical classes in the following years[263]. Schools resumed on-site classes in September; however, they may switch to distance or blended learning if approved by the local health authorities.

ICT specialists are needed. In 2018, a third of Polish enterprises needing ICT specialists reported difficulties in filling vacancies. The supply of ICT specialists is gradually growing, but remains below the EU average. ICT specialists represent a lower proportion of the workforce (3%) than the EU average (3.9%) and only 0.9% of employed women are ICT specialists (European Commission, 2020).

Several digital training initiatives were launched. In 2019, the Ministry of National Education launched an initiative to enhance the use of modernised content, tools and e-resources in initial and continuing VET. It is expected to improve provision for learners with disabilities, develop learners' digital competences and promote learner-centred teaching and teamwork. To support long-term productivity, Poland needs to continue improving digital skills and female participation in the digital domain (European Commission, 2020).

260 Open Eyes Economy Summit, https://oees.pl/alerty-eksperckie/; https://oees.pl/wp-content/uploads/2020/08/Raport-edukacja.pdf

261 http://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20190001450

262 https://www.ore.edu.pl/category/projekty-po-wer/opracowanie-modelu-scwew/

263 https://www.gov.pl/web/koronawirus/szkola

Box 2: *Modernisation of vocational education in Małopolska II (MVEM II)*

'Career Festival' is part of a project to modernise vocational education in the Małopolska region, carried out under the Regional Operational Programme between 2016-2023, supported by ESF. The festival promotes vocational education, vocational counselling and professional orientation. It addresses pupils in the last grades of primary schools to help them make educational and professional career choices.

Every year, nearly 150 exhibitors, including a wide range of schools, present their educational offer in an interactive manner, allowing pupils to see and experience what their future career path could look like. They have an opportunity to see robots operated by students in mechatronics, be made up and have their hair styled, talk to woodworkers or shoe designers and taste food prepared by chefs-to-be. There are also panels for parents. The seventh Festival, held on 21-23 March 2019, was visited by over 30 000 people. Thanks to the transport provided, pupils from remote parts of the region could participate.

ESF support: EUR 2 085 920

See: https://www.malopolska.pl/ksztalcenie-i-doradztwo-zawodowe/festiwal-zawodow/festiwal-zawodow-2019

7. Modernising higher education

Tertiary education attainment is well above the EU average, yet the gender gap widens. In 2019, the higher educational attainment rate was 46.6%, up by 0.9 p.p. since 2018 and exceeding the Europe 2020 national target of 45%. The gender gap at 19.2 pps in favour of women is significantly above the EU average of 10.5 pps. The overall proportion of graduates in science, technology, engineering and mathematics (STEM) decreased to 21.6% (EU 25.4%)[264]. The proportion of women in STEM at 9.4% is above the EU average (8.5%). The employment rate of recent tertiary graduates increased from 83.7% in 2010 to 90.1% in 2019 (EU 85%). Poland's graduate tracking system (ELA[265]) shows that the labour market situation of graduates is improving. The risk of unemployment among graduates drops below the national average around 9 months after graduation. Graduates in engineering, IT, mathematics and economics have the highest salaries; those in medical, engineering and social studies are most likely to find jobs quickly (Chłoń-Domińczak, 2019).

Higher education institutions (HEIs) are implementing the latest reform aimed at improving quality[266]. 2019/2020 was the first full year of implementation of the reform. HEIs are putting in place new statutes, reorganising their staff and setting up scientific councils. They are also preparing for the first cycle of scientific evaluations according to the new principles planned for 2022 under new quality assurance institutions (e.g. the Council of Scientific Excellence, the Science Evaluation Committee). Critics argue that despite valuable new initiatives such as the 'Masters of teaching', the importance of teaching is undervalued in the new law[267] (Żylicz, 2019), which provides no requirements for lecturers to undertake initial pedagogical training or continuing professional development. The OECD Skills Strategy for Poland suggests strengthening support and incentives for effective teaching in HEIs (OECD, 2019c).

Internationalisation of higher education is slightly improving. The number of foreign students increased by 7.6% between 2017/2018 and 2018/2019 and now constitute 6.3% of the total. The majority of foreign students come from Ukraine, Belarus and India (Statistics Poland, 2019b). However, the inward degree mobility rate remains limited at 2.3% (EU 7.8%)[268] in 2018. Poland subsidises the programme `Poland my First Choice´[269], seeking to encourage students from

264 Eurostat, UOE: [educ_uoe_grad03].

265 http://ela.nauka.gov.pl/en/

266 Law 2.0 *(Ustawa 2.0)* of 20 July 2018 came into force on 1 October 2018.

267 http://obywatelenauki.pl/2019/05/co-dalej-z-dydaktyka-akademicka-czyli-smutne-refleksje-po-reformie/

268 Eurostat, UOE: [educ_uoe_grad01] and [educ_uoe_mobg02].

269 https://nawa.gov.pl/studenci/studenci-zagraniczni/program-poland-my-first-choice

target countries to pursue second-cycle studies there. According to the 2018/2019 Mobility Scoreboard, learning mobility support for disadvantaged students could be improved (European Commission/Eurydice, EACEA, 2020c).

Overall, HEIs moved swiftly to online learning, although some were strongly affected. Due to COVID-19, HEIs implemented distance learning, as well as online recruitment, exams and assessments between mid-March and the end of the academic year. According to a survey among students, 47% reported having had distance learning in all classes while 24% indicated they missed out in more than one class (NZS, 2020). It was remarked that the closure strongly affected medical, pedagogical and artistic HEIs, as many activities could not be conducted remotely[270]. In consultation with stakeholders, the Ministry for Science and Higher Education prepared guidelines for reopening from 25 May. Following a competition launched under the operational programme 'Knowledge, Education, Development', the MOOC platform www.navoica.pl, managed by the Ministry of Science and Higher Education, will include new e-learning courses focused also on digital literacy.

8. Promoting adult learning

Adult learning needs strong reinforcement. Although the education system is gradually opening up to non-formal adult education and informal learning, the scale and the results remain weak. At policy-making level, the priority is to develop the details of the integrated skills strategy (MoE, 2019) and sectoral skills councils. The limited progress suggests a need for inter-ministerial cooperation. At employer/employee level, there is a need to raise awareness of the benefits of lifelong learning and improve access to learning opportunities (MoE, 2019). Poland continues implementation of the ESF LOWE project (Local Knowledge Education Centres), and in June, the government approved the national 'folk university support programme 2020-2030' aimed at providing adult learning opportunities (Eurydice, 2020).

More adults need digital skills, especially in the post-COVID-19 world. Despite the increasing numbers of adults going online, basic and advanced digital skills remain below the EU average. Only 44% of individuals have at least basic digital skills (EU 58%) (European Commission, 2020). Evidence shows that while the majority (70%) of the digitally excluded are aware of the benefits of internet use, more than half do not see any need to start using technology, and about one in four do not believe that they can learn these new skills. According to the draft 'digital competences development programme 2030', interventions to date in digital education for adults have lacked resources and focus on media literacy and digital hygiene. The majority of digital education opportunities for adults are co-financed from the ESF and ERDF.

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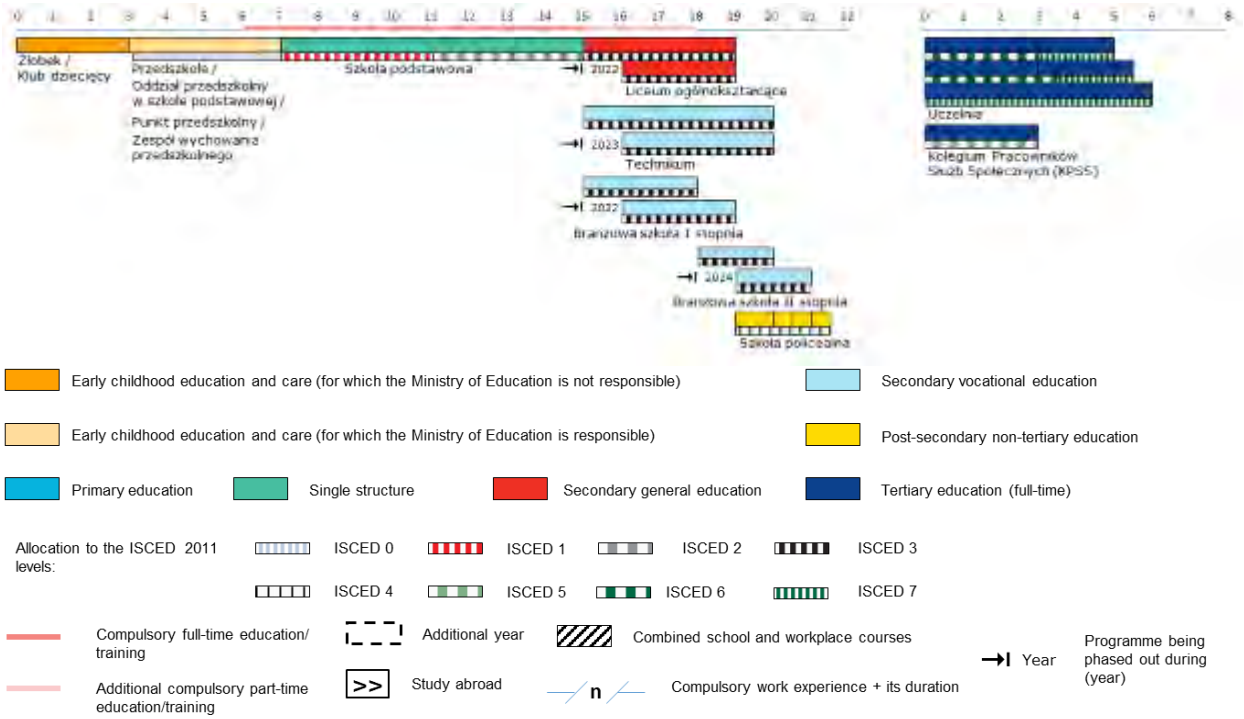
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Sylwia SITKA
Sylwia.SITKA@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

PORTUGAL

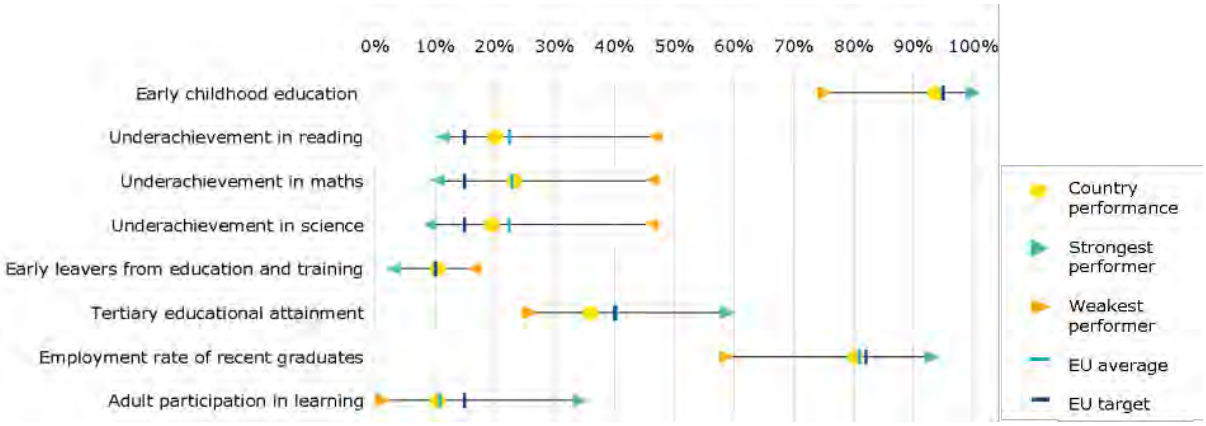
1. Key indicators

Figure 22 – Key indicators overview

			Portugal		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			30.9%	10.6% [b]	14.0%	10.2%
Tertiary educational attainment (age 30-34)			21.3%	36.2% [b]	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			90.1%	93.7% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		17.6%	20.2% [18]	19.3%	22.5% [18]
	Maths		23.8%	23.3% [18]	22.2%	22.9% [18]
	Science		16.5%	19.6% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		82.4%	80.3% [b]	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		6.4%	10.5% [b]	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	4.2% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	7.0% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		6.5%	4.5% [e, 18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€5 239 [12]	€5 597 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€6 907 [d, 12]	€7 016 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€7 403 [d, 12]	€8 209 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		31.0%	10.3% [b]	12.6%	8.9%
	Foreign-born		29.6%	14.4% [b]	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		21.1%	36.2% [b]	32.0%	41.3%
	Foreign-born		22.6%	36.5% [b]	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		79.7%	74.4% [b]	72.2%	75.9%
	ISCED 5-8		84.0%	85.3% [b]	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs; u = low reliability; : = not available; 12 = 2012, 16 = 2016, 17 = 2017, 18 = 2018..

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- The digital skills of the population are improving, but remain below the EU average. Teachers need further training in digital competences and schools require better infrastructure and digital equipment.
- The proportion of early leavers from education and training remains higher in the island autonomous regions than on the mainland. The pandemic crisis revealed a socio-economic divide in students' access to digital technology. The teacher workforce is ageing.
- There are plans to increase the provision of accommodation at affordable prices for tertiary students. The attractiveness of technical tertiary studies is growing.
- New initiatives are fostering enrolment in vocational education and training (VET). Slow progress of the participation rate in adult learning.

3. A focus on digital education

The population's digital skills remain low but are improving. According to the European Commission's Digital Economy and Society Index (DESI) 2020, Portugal ranks 20 of 27 Member States in human capital, significantly below the EU average. In 2019, 48% of the population lacked basic digital skills and around 26% had no digital skills at all (European Commission, 2020a). While increasing, Portugal's share of information and communication technologies (ICT) specialists in total employment in the EU-27 continues to be one of the smallest (2.8% v 3.8% in 2019), and its share of ICT tertiary graduates in the total graduate pool is similarly low (2.2% v 3.8% in 2018). An Observatory for Digital Competences[271] monitors the national digital, information society and media literacy strategy (the InCoDE 2030 initiative), which includes objectives for digital education. InCoDe 2030 sets out several indicators and mid-term goals (years 2020, 2025, 2030) grouped into four main categories[272]: access, human capital, use and investment. None of the 2020 human capital targets have been achieved so far[273].

The national education curriculum covers digital competences at all education levels. Introduced in 2018/2019 in the first years of each school cycle, digital competences have since then been gradually extended to all other grades (European Commission/EACEA/Eurydice, 2019). The 'student profile at the end of compulsory schooling'[274] includes competences related to ICT and digital literacy. Digital competences cover four domains: digital citizenship, search and analysis, communication and collaboration and creativity and innovation. Digital competences are cross-curricular in lower primary education (grades 1-4), while in upper primary and lower secondary education (grades 5-9) they form a compulsory separate subject. In upper secondary (grades 10-12), ICT subjects are optional separate courses[275]. The Ministry of Education provides guidelines for digital content in the curriculum specific to each education level (Ministry of Education, 2019); as well as digital resources and teacher training. Within the Programme of Curricular Autonomy and Flexibility[276], schools can use the guidelines to decide how to integrate digital competences into their programmes.

Teachers require further training to improve their digital competences. Primary and lower secondary school teachers' level of confidence in their own digital competences is below the EU average (European Commission/EACEA/Eurydice, 2019; CNEDU, 2019). The Teaching and Learning

271 http://observatorio.incode2030.gov.pt/o-observatorio/

272 https://www.incode2030.gov.pt/en/goals

273 http://observatorio.incode2030.gov.pt/indicadores/indicadores-todos/

274 https://dge.mec.pt/sites/default/files/Curriculo/Projeto_Autonomia_e_Flexibilidade/perfil_dos_alunos.pdf

275 For instance, in the final year of secondary education (12th grade), there is an optional course on computer applications where students can learn basic notions of coding, algorithms and programming, as well as an introduction to multimedia technologies.

276 For reference see the OECD review (2018): http://www.oecd.org/education/2030/Curriculum-Flexibility-and-Autonomy-in-Portugal-an-OECD-Review.pdf

International Survey (TALIS) 2018 (OECD, 2019a) shows that, on average, 40% of teachers feel well or very well prepared on the use of ICT for teaching, but 12% report a high need for professional development in this area (EU-22 averages 42% and 18% respectively). The proportion of teachers trained in the use of ICT remained broadly stable compared to TALIS 2013 (47% v 49%) and is higher among novice teachers (those having graduated in the last five years) at 72%. The share of teachers who have been trained in the pedagogical use of ICT and on learning applications is well below the EU average (European Commission/EACEA/Eurydice, 2019). Portugal has adopted the European self-assessment tool (TET-SAT[277]) to help teachers evaluate their level of digital competence and thereby define their development needs (European Commission/EACEA/Eurydice, 2019a). A set of short training actions and workshops have been developed (Ministry of Education, 2019) and massive open online courses (MOOCs) on digital-literacy-related topics are available.

The use of digital means for teaching remains limited. TALIS 2018 (OECD, 2019a) shows a higher proportion of teachers letting students use ICT for project or class work (57%) than in 2013 (34%). The share of students who use a computer at school for learning is below the EU average for lower secondary education (36% v 52%) and upper secondary education (43% v 59%) (European Commission, 2019). According to the International Computer and Information Literacy Study (ICILS), only 20% of students surveyed were assessed as independent users of a computer, while the vast majority needed direct instructions to complete basic tasks (Fraillon et al., 2019). The assessment of students' digital competences is made by taking into account the learning outcomes stated in the national curricula. Portugal does not use digital technologies in national tests (European Commission/EACEA/Eurydice, 2019).

Schools require further investment in digital equipment. In public schools located on the mainland (excluding Madeira and Azores) there are on average 5.6 students per computer in primary education, 4.3 in lower secondary education and 4.1 in upper secondary education[278]. In private schools, the proportion is lower in primary and upper secondary, but higher in lower secondary. In public schools, the average number of students per computer has increased in the past 3 years. There are 28% fewer computers in schools and the percentage of old computers (more than 3 years) increased from 64.4% to 85% during the same period (ANPRI, 2018; CNEDU, 2019). TALIS 2018 (OECD, 2019a) shows that 37% of school principals report insufficient internet access. Constraints in public finances left families alone to invest in digital equipment and training, amplifying equity issues. The Government have prioritised during the COVID-19 pandemic of providing schools with digital devices, focusing mainly on socio-economic disadvantaged students and financially supported with EU funds.

Box 1: A national contest for schools on programming and robotic education plans

The National Network of Programming and Robotics Clubs (CPR) was launched in 2014/2015 by the Ministry of Education. Currently, 386 school clubs are registered all over the country involving students from all education levels.

As of 2014/2015, the Ministry launched an annual competition targeting all independent and clustered schools, public or private, from mainland Portugal, with a CPR in operation. In the competition's first phase, the education establishments present a project and an annual activity plan for the CPR. At a later stage, selected CPRs participate in a regional event, through an exhibition and a public presentation and the best make a presentation at a national event. Prizes are awarded to the three best CPR projects at national level. For 2019/2020, three main categories were chosen: robotic vehicles, smart objects and environments, and other free topics.

More information available at: https://www.erte.dge.mec.pt/clubes-de-programacao-e-robotica; https://erte.dge.mec.pt/sites/default/files/Projetos/Programacao/CPR/regulamento_cpr_2019_2020.pdf

[277] Tool developed as part of the Mentoring Technology Enhanced Pedagogy policy experiment project supported by the European Union through the Erasmus+ programme; http://mentep.eun.org/tet-sat

[278] DGEEC/ME-MCTES; PORData

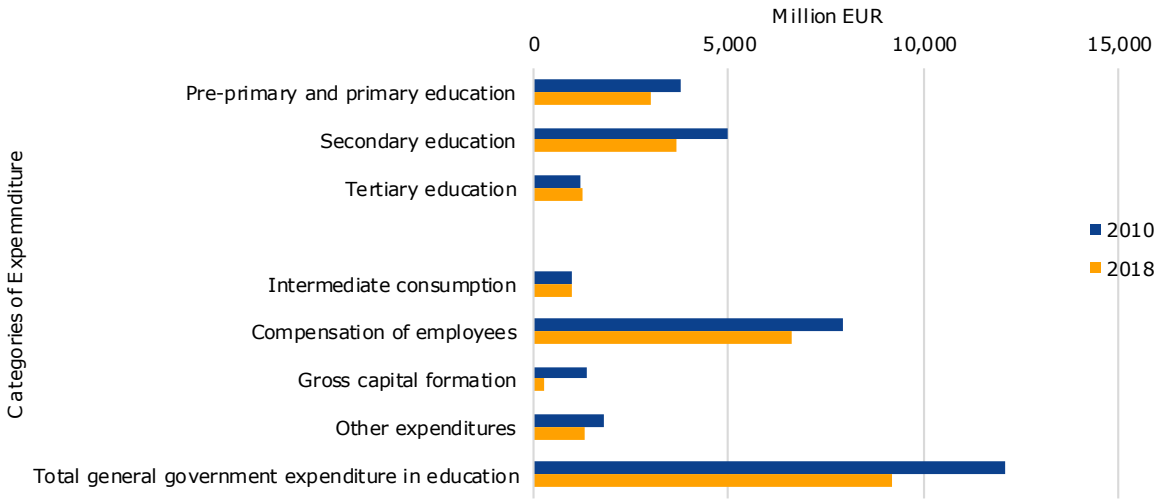
4. Investing in education and training

The education budget is close to the EU average: spending on salaries is high and low on gross capital formation[279]. In 2018, Portugal spent 4.5% of GDP on education and this represented 10.5% of total public expenditure, close to the EU averages (4.6% and 9.9% respectively). Public spending on education increased by 1.3% between 2017 and 2018 in real terms. Spending on secondary education represented 1.8% of GDP, 1.5% of GDP went on pre-primary and primary and 0.6% on tertiary education. 72% of spending went on compensation of employees, well above the EU average of 65%, while the 3% spending on gross capital formation is low (EU-27 7%). Education spending is mainly incurred by central government (3.8% GDP) at all education levels and to a lesser extent by local governments (0.7% GDP). Portugal is one of the EU countries with the highest shares of private spending (16% of total), most of it being household expenditure (15%)[280].

Spending on education has decreased in the last decade. Over 2010-2018, there was a decrease in general government expenditure on education (in deflated values) of 24% (EUR 3 billion less). In tertiary education, real expenditure grew by 5% (EUR 70 million more)[281]. During the same period, EU-27 average spending in education increased by 4% (2% in tertiary education). The major real expenditure reductions between 2010 and 2018 were in gross capital formation (-79%) and compensation of employees (-17%).

A significant investment in digital training is planned. The government will invest EUR 23 million by 2021 in the digital training and qualification of the population. The European Commission's proposal for the European Council 2020 country-specific recommendation to Portugal includes 'support the use of digital technologies to ensure equal access to quality education and training and to boost firms' competitiveness' (European Commission, 2020b).

Figure 3 – General government expenditure on education (in deflated values) 2010-2018



Source: DG EAC, from Eurostat's general government finance statistics (2018). Online data code: [gov_10a_exp].

[279] Gross capital formation comprises the acquisition less sales of fixed capital (e.g. buildings, vehicles, and machinery for example), inventories (stocks of raw materials, work in progress and finished goods) and other valuables items held as stores. See for additional information https://ec.europa.eu/eurostat/documents/3859598/5917333/KS-RA-11-013-EN.PDF

[280] Education at a Glance 2019 : OECD indicators

[281] Eurostat: [gov_10a_exp].

5. Modernising early childhood and school education

The participation rate in early childhood education (ECE) slightly decreased. In 2018, the proportion of pupils from age 4 until the age of compulsory primary education (6) participating in ECE decreased by 0.5 pps (from 94.3% in 2017 to 93.7%), slightly below the EU benchmark of 95%[282]. The participation rate in formal childcare of children under 3 was 50.2%, above the EU average (34.7%)[283]. Regional differences in ECE participation persist, ranging from 97.8% in the autonomous island regions of Madeira and the Azores to 87.4% in the metropolitan area of Lisbon[284]. There is a persistent lack of places in public pre-primary schools, particularly in large metropolitan areas. National data indicate that the average occupation rate for pre-primary schools is 85.6%, higher in the metropolitan areas of Lisbon (90.4%) and Porto (92.4%). 47% of children attend private kindergartens (above the EU average of 23%), ranging from 56% in the metropolitan area of Lisbon to 37% in the Azores[285]. In 2019, pre-primary education institutions made 1 400 more public places available for children aged between 3 and 5 (European Commission, 2020c). In 2020/2021, 88 new classrooms will be opened in the pre-primary education public school network, mainly in the Lisbon and Oporto metropolitan areas, giving rise to a further 2.200 places. The average number of hours per week that Portuguese children spend in ECE is 39.1, among the highest of EU countries (CNEDU, 2019).

Basic skills levels are around the EU average. The OECD Programme for International Student Assessment (PISA) 2018 survey shows that Portugal is one of the few countries with a positive trend in all three tested subjects (reading, mathematics and science) over the 2009-2018 period (OECD, 2019b). Compared to 2015, only the average score in science decreased. Girls are significantly better in reading, while boys perform better in mathematics. The rate of underachievement in all three tested subjects remained stable over the 2009-2018 period, and is close to the EU average (European Commission, 2020d) but still far above the 15% ET2020 benchmark. The proportion of top performers in reading and mathematics was unchanged between 2015 and 2018, but decreased in science.

Students' background has a strong influence on educational outcomes. PISA 2018 shows that socio-economic background is a strong predictor of student performance, even if its impact was less than the EU average, (OECD, 2019c). The gap between advantaged and disadvantaged students in reading corresponds to over two years of schooling (95 score points). The mean score in reading of students with a migrant background is below that for native pupils (463 v 495 score points). This gap is particularly large for those born abroad and much narrower for pupils born in Portugal from a migrant background (483 points). Moreover, disadvantaged pupils are significantly less likely to complete tertiary education (OECD, 2019d).

The gender gap in science, technology, engineering and mathematics (STEM) careers is high. Among high-performing students in mathematics or science, about half of male students expect to work as an engineer or science professional, while only about one in seven females expects to do so. About 6% of boys, but only 1% of girls, expect to work in ICT-related professions (OECD, 2019d).

There is comparatively good student well-being. In Portugal, few students (14%) reported being bullied at least a few times a month, the second lowest in the EU (22%). A small proportion of students in Portugal reported always feeling sad, compared to other PISA-participating countries and economies (OECD, 2019e).

High dropout and early school leaving rates persist in the Azores and Madeira. The last available data from 2017 indicate dropout rates of 26.9% in the Azores and 23.2% in Madeira, above that in mainland Portugal (13.3%)[286]. Nevertheless, these figures are much better than in

[282] Eurostat, LFS: [educ_uoe_enra10].

[283] Eurostat, LFS: [ilc_caindformal].

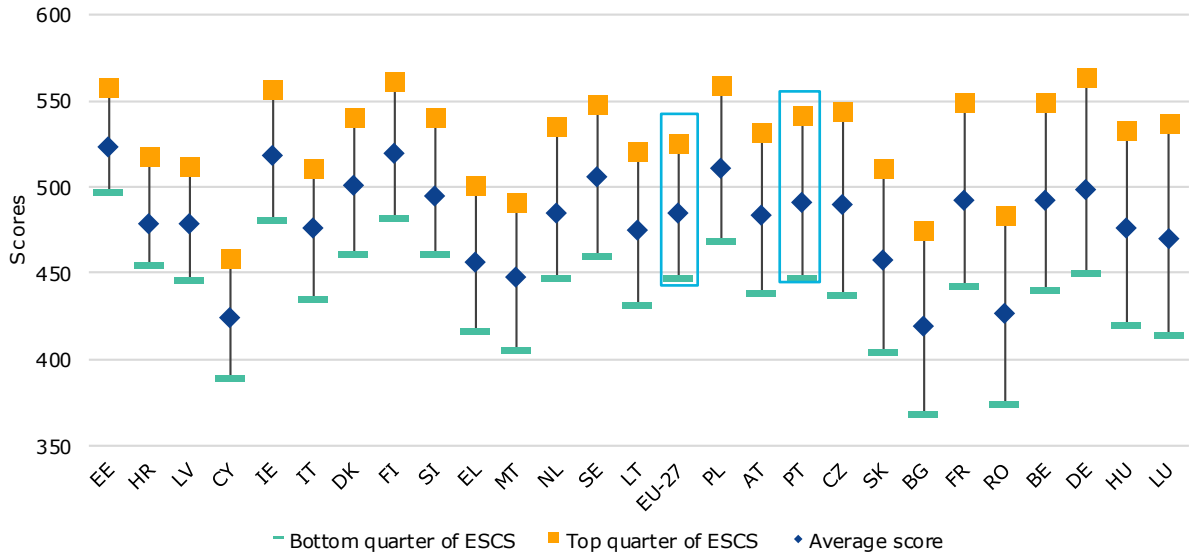
[284] Eurostat, LFS: [educ_uoe_enra17].

[285] Source National Institute of Statistics (INE)

[286] Source National Statistics Pordata

2010 (27.5% in mainland Portugal, 44.8% in the Azores and 36.6% in Madeira). Following the positive trend in the last 10 years, the rate of early leavers from education and training keeps decreasing and stood at 10.6% in 2019, close to the EU average of 10.2% and lower than in 2018 (11.8%)[287]. All regions have reduced their rates, but Azores still have the highest proportion (27%), although less than in 2018 (28.3%)[288].

Figure 4 - Reading performance by socio-economic status (ESCS), PISA 2018



Source: (OECD, 2019c), PISA 2018.

Education moved quickly to distance learning in response to the pandemic crisis. Due to the COVID-19 outbreak, schools and universities were closed down on 16 March 2020 and in-person education was replaced by distance learning. This included broadcast TV programmes #EstudoEmCasa[289] (study at home) for all education levels, also available via YouTube. The Directorate-General for Education and the National Agency for Qualifications and Professional Education (ANQEP) created a portal named Apoio às Escolas[290] (School Support), which provides distance learning resources for schools. A number of initiatives from different stakeholders were adopted to help teachers become more proficient in online and distance learning[291]. In higher education, various tools were used, notably the Colibri collaboration platform[292] developed by the National Scientific Computation Unit of the Foundation for Science and Technology (FCCN-FCT). The school year for all grades, from pre-schooling to upper secondary education, was extended until 26 June. Kindergartens (ages 0-2) opened on 18 May and pre-schools (ages 3-5) on 1 June. Upper secondary students returned to class in mid-May but only for subjects covered by the national examination; the remaining subjects continued to be taught through distance learning. Primary and lower secondary students did not return to class. The national end-of-school exams (‘*exames finais nacionais*’), which give access to higher education studies, were postponed by around one month for the first and second round (July and September).

The school closures posed significant challenges to socio-economically disadvantaged students. A survey by the National Statistics Institute in November 2019 reported that 5% of households with children up to the age of 15 do not have access to internet[293]. It is estimated that

287 Eurostat, LFS: [edat_lfse_14].

288 Eurostat, LFS: [edat_lfse_16].

289 https://estudoemcasa.dge.mec.pt/

290 https://apoioescolas.dge.mec.pt/

291 Among others: *Escola de Professores* (Teachers’ School) *Escola Virtual* (Virtual School) and *Aula Digital* (Digital Class).

292 https://www.fccn.pt/en/collaboration/colibri/

293 https://www.ine.pt/ngt_server/attachfileu.jsp?look_parentBoui=405769656&att_display=n&att_download=y

50 000 and 70 000 students (around 6% of total) do not have computers at home[294]. Families with lower incomes have fewer available computers than those with higher incomes (41% v 96% of households), below the EU-27 averages (67% and 97% respectively)[295]. According to Fraillon et al. (2019) 58% of students from families with lower incomes have less than two computers to share at home.

6. Modernising vocational education and training

VET enrolment remains below the EU average. Total enrolment in upper secondary VET saw a slight decline in 2018, representing only 39.7% of all students (EU average 48.4%). The employment rate among recent VET graduates has declined again to 76.0% in 2019 from 77.4% in 2018 (EU average 79.1%).

Portugal intends to increase the attractiveness of apprenticeships. The aim is to promote greater involvement of companies in training and boost the apprentices' employment rate up to at least 80%. To this end, in 2019 the Institute of Employment and Vocational Training (IEFP) launched a strategy and funded a pilot project called 'Apprenticeship gives employment'. Training institutions carry out the project in the tourism sector, in cooperation with business associations, which are responsible for mobilising companies to provide apprenticeship placements and ensure job offers. After tourism, other sectors will follow (automotive, construction, etc.).

There is a new access route to higher education, available as from this year, to students who complete professional education. In spite of the COVID-19 pandemic, those students will take regional exams to access tertiary studies. VET schools were able to replace 'practical training' by 'simulated practices', taken in distance learning mode.

The training of VET teachers and trainers remains a priority. A process for recognition, validation and certification of the competences of trainers (RVCC-For), launched in 2019, targets professionals with proven experience as trainers or in other education and training activities, who wish to certify their pedagogical competences acquired through formal or informal ways.

Portugal aims to qualify people and organisations to face the challenges of the fourth industrial revolution, through the programme Capacitar i4.0, linked to the Industry 4.0 strategy and INCoDe.2030.

Box 2: Increasing labour market relevance and employability through professional courses

Professional courses ('*Cursos Profissionais*') is a project supported by the European Social Fund for the 2014-2020 period. It aims to improve the labour market relevance of education and training, facilitate the transition from education to work and strengthen the quality of VET. It includes mechanisms for skills anticipation, curricula adaptation and the creation and development of work-based learning systems, including dual education and apprenticeship systems. These constitute one of the dual secondary education and training pathways, where training is carried out simultaneously in a school and work context, in conjunction with local employers, thus giving priority to educational/training offers that correspond to local and regional needs.

Courses take place in three-year cycles and the curriculum is organised in modules and/or units of short-duration training (UFCD), allowing greater flexibility and adaptability to students' learning preferences. At the end of the training course, students must complete a professional aptitude test, consisting of a presentation, before a jury of external stakeholders (representatives from business associations and trade unions, among others), of a project developed in a work context; and also demonstrating the professional knowledge and skills acquired throughout the training.

[294] https://tek.sapo.pt/expert/artigos/ministerio-da-educacao-reforca-medidas-para-manter-alunos-ligados-a-escola-via-online-durante-o-isolamento

[295] Eurostat: [isoc_ci_cm_h].

So far, at the Ruiz Costa Professional School, 900 students have been trained mainly in 3D digital design; electronics, automation and computers; multimedia and technical management and programming computer systems. Graduation rates for the 3-year cycle were 80-90% and the rate of employability and/or continuation of studies measured 6 months after completion of the course was 79%. This data is monitored under EQAVET, the quality system by which the school is certified. Up to March 2020, this school had already approved financing of around EUR 6.3 million from the European Social Fund.

7. Modernising higher education

Higher education enrolment and tertiary attainment keeps increasing. In 2019, tertiary education attainment (aged 30-34) reached 36.2%, higher than in 2018 (33.5%), but still below the national benchmark (40%) and the EU-27 average (40.3%). Regional differences persist, ranging from 29.3% to 40.3%[296]. In 2018, new entrants in bachelor's degree studies increased by 8%, but decreased 21% in master studies[297]. CNEDU (2019) reports an 8% increase in 2017/2018 of students enrolled for the first time compared to 2016/2017. Only 30% of students who enter a bachelor programme graduate within 3 years (the expected duration of the programme for most fields) (European Commission, 2020c). The measures taken to ease and widen enrolment to higher education (reducing fees and increasing the number of available university places, scholarships and student housing facilities) seem not to show any major impact yet.

Technical studies are increasingly attracting tertiary students. In 2017/2018, around 35% of students were enrolled in polytechnic institutes (universities of applied sciences) – a growing trend in the last few academic years. Nearly 7 000 students were enrolled in short-term technical and professional training courses (63% men) (CNEDU, 2019). In 2018-2019, most of the increase in overall enrolment happened in these short-term technical courses (DGES, 2019).

There are increasing numbers of students in ICT and science-related studies, yet low numbers of graduates. Between 2008/2009 and 2017/2018, around 1 000 more students were enrolled annually in the first year of science, mathematics and statistics, and ICT studies. In 2018, 2.6% of total students enrolled in higher education were studying ICT and 6% science, mathematics and statistics - a slightly higher share in ICT than in 2017 (2.4%), but far from the EU-27 averages (4.9% and 7.1% respectively in 2018). The proportion of ICT graduates in the total graduate pool remains one of the lowest of all fields of education (2.2% in 2017/2018) (CNEDU, 2019), and lower than the EU average (3.6%) (European Commission, 2020a).

There is a shortage of student accommodation at affordable prices. Expensive tuition fees and high rents, especially in big cities, represent some of the main barriers to study, particularly for those from low-income households, and force many university students to abandon their studies. Under Law 36/2018[298], the government adopted an initiative for the reassignment and construction of residences for public higher education students. In 2019, the National Plan for Accommodation in Higher Education was launched (PNAES) (Portuguese Government, 2019) aiming to double in four years the current offer by creating 12 000 more housing facilities at regulated prices. By 2030, they expect to offer a total of 30 000 student accommodation places. In 2019, 600 more beds were available thanks to cooperation with youth hostels, military facilities and churches. Another 2 500 new beds are planned by 2020 and 2 700 by 2021. The majority of them are in the Lisbon and Porto areas.

296 Eurostat: [edat_lfse_12].

297 Eurostat: [educ_uoe_ent01].

298 Diario Da Republica: https://dre.pt/application/conteudo/115764791

8. Promoting adult learning

Adult participation in lifelong learning keeps growing slowly. In 2019, the participation rate of adults in education and training (10.5%) remained barely unchanged in comparison with 2018 (10.3%). The share of unemployed (aged 25-64) participating in learning decreased from 13.2% to 12.9%.

Participation in the flagship programme Qualifica, designed to tackle the adult population's low skills level, continues to grow. Over 444 000 adults were involved by December 2019 (still far from the 2020 target of 600 000). However, detailed data regarding the training provision and employability results are still lacking, which makes it hard to assess the programme's effectiveness.

Vulnerable groups, such as inmates and the homeless, are being catered for in upskilling and reskilling plans. There will be a new strategic action plan for the homeless that includes appropriate training programmes. A new social training project aims to provide inmates with digital skills to help their reintegration into the labour market.

Digital education opportunities in programmes directed at adult learners and adult educators are scarce and do not meet the clear needs of the adult population. There is also a need to improve the digital education qualifications of teachers and adult educators and raise awareness about the importance of digital education in adult learning programmes and activities.

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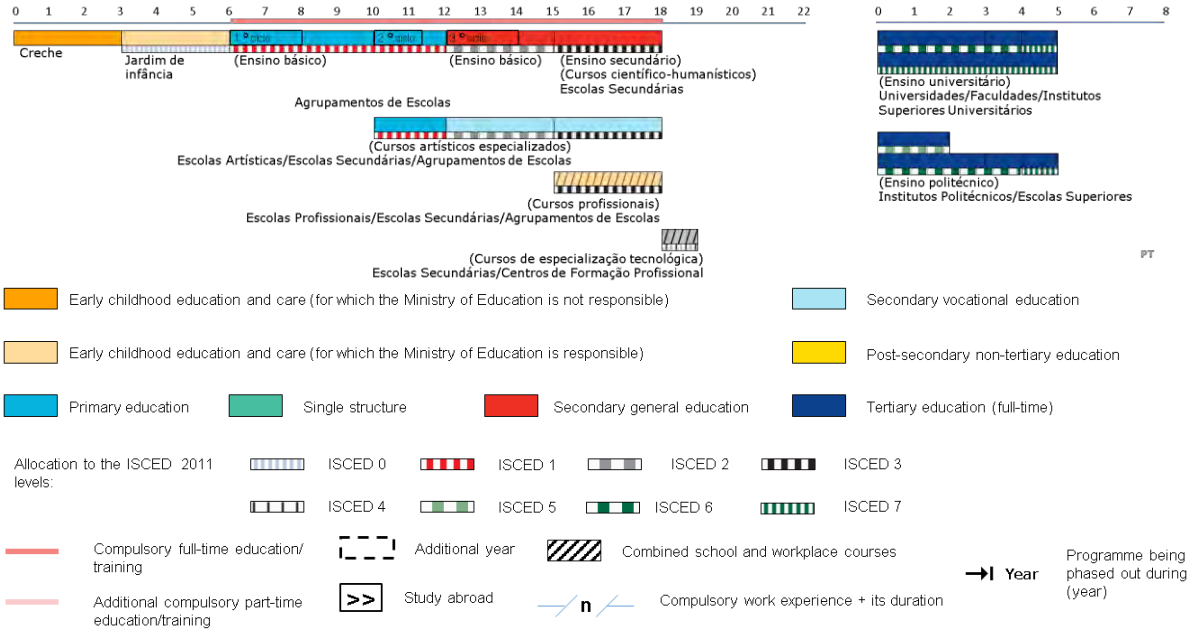
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Antonio GARCIA GOMEZ
Antonio.GARCIA-GOMEZ@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

ROMANIA

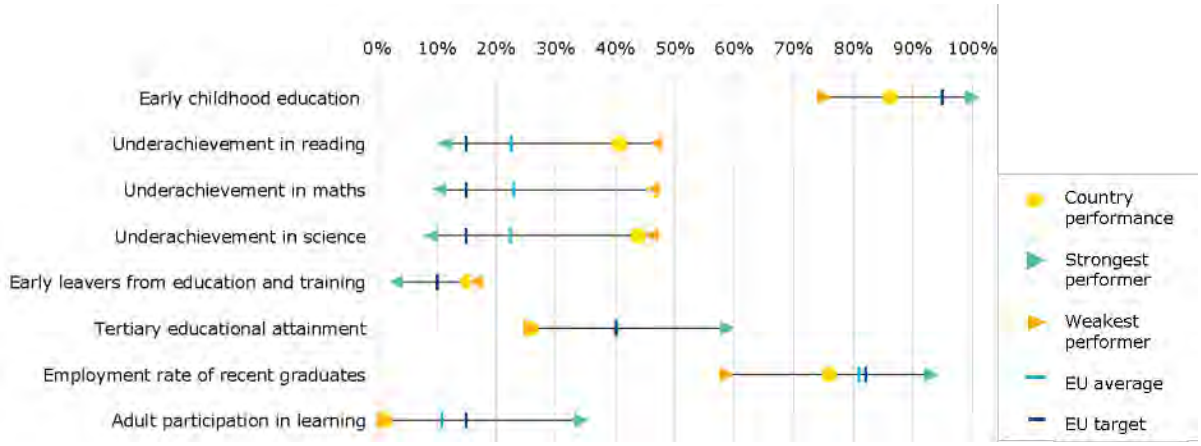
1. Key indicators

Figure 23 – Key indicators overview

			Romania		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			16.6%	15.3%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			16.8%	25.8%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			88.0%	86.3% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		40.4%	40.8% [18]	19.3%	22.5% [18]
	Maths		47.0%	46.6% [18]	22.2%	22.9% [18]
	Science		41.4%	43.9% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		77.6%	76.1%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		1.8%	1.3%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	6.0% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	1.7% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		3.8%	3.2% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€1 668 [12]	€1 930 [16]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€1 769 [12]	€2 466 [16]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€4 035 [12]	€4 688 [16]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		16.7%	15.4%	12.6%	8.9%
	Foreign-born		: [u]	:	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		16.7%	25.8%	32.0%	41.3%
	Foreign-born		: [u]	: [u]	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		69.1%	66.9%	72.2%	75.9%
	ISCED 5-8		85.7%	87.6%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs; u = low reliability; : = not available; 12 = 2012, 16 = 2016, 17 = 2017, 18 = 2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Some efforts have been made to improve the quality of early childhood education and care and strengthen initial teacher education.
- Despite several initiatives, there is a need to increase the digital skills of teachers, trainers and students and better equip schools with digital equipment.
- A large percentage of young people have inadequate levels of basic skills. Ensuring quality and labour market-relevant education and training is still a key challenge.
- Socio-economic background significantly affects students' performance, limiting the role that education can play as an equaliser of opportunities. Despite measures to mitigate the impact of COVID-19 in education, the shift to distance learning risks worsening already high inequalities.

3. A focus on digital education

Despite several initiatives to digitalise the education system, the need to improve the acquisition of digital skills remains high. In 2015, Romania adopted a national strategy on the Digital Agenda setting out actions until 2020 in key areas that included the use of information and communication technologies (ICT) in education. However, the degree to which the commitments of the strategy were met is unknown (European Commission, 2020a). Although Romania has progressively integrated elements of digital technology in its policies, school curricula and training programmes, and despite some major investments at national level, a lack of monitoring and support mechanisms has resulted in many of these initiatives not being sustainable (Balica M et al., 2018). To date, the results remain limited (European Commission, 2020a). At the same time, the private sector, especially tech companies, has started a number of projects with schools and universities focusing on teacher training and development of digital learning resources[299], as well as provision of digital equipment. Overall, only 57% of young Romanians aged 16-19 have basic or above basic digital skills (EU average: 82%). The gap with the EU average is particularly evident in problem solving and software skills, which include making decisions about digital tools and using them, purchasing online, creating content and coding. ICT is an optional subject in primary grades and, since 2017, a compulsory subject in lower secondary education. However, schools in rural areas, which provide schooling to 43% of students[300], are less able to offer digital education due to having fewer qualified teachers and poorer digital infrastructure. In upper secondary education, students' digital competences are evaluated as part of the baccalaureate exam through a fail/pass practical test, which can be equated with the European Computer Driving Licence.

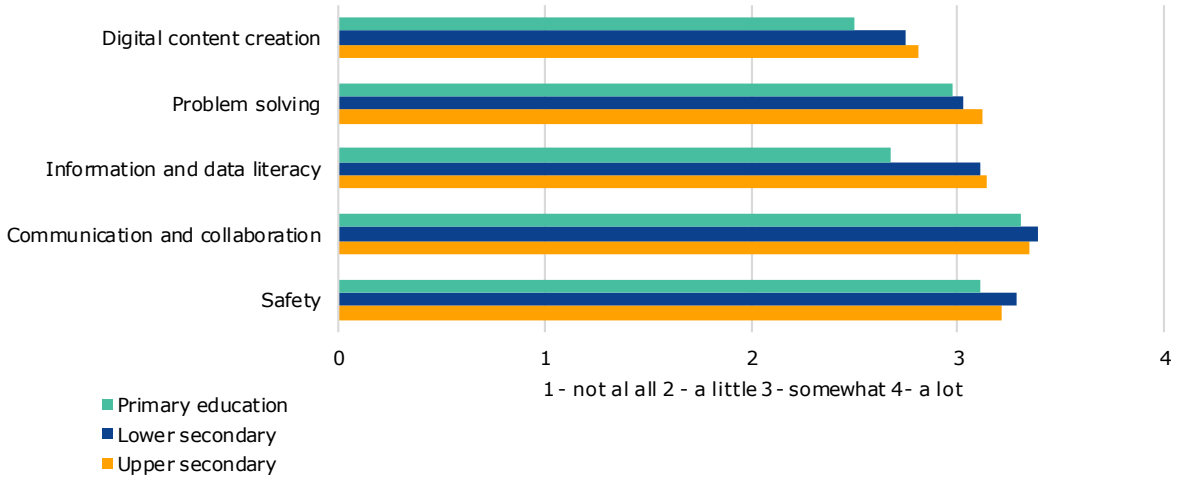
Several areas of teachers' digital skills require strengthening. Romanian teachers feel confident about certain aspects of their digital skills, in particular about communication and collaboration (see Figure 3), but less so when it comes to digital content creation, information and data literacy (European Commission, 2019). Similarly, the OECD's 2018 Teaching and Learning International Survey (OECD, 2019a) showed that almost 70% of lower secondary teachers believe they are well or very well prepared for the use of digital methods in teaching, while 21% reported a high need for professional development in ICT skills (EU average: 18%). Despite a large number of training courses being available for digital skills, their quality, coverage and relevance are lower than expected (ISE, 2018). At the same time, teachers often feel exposed and do not know how to react to the expectations and demands of their students related to the use of technologies for learning (ibid). In addition, more than half of the teachers surveyed had insufficiently developed competences for the effective use of online learning platforms. The CRED project (Relevant Curriculum, Open Education for all), co-financed by the European Social Fund, has been supporting the development of teacher competences, including during the COVID-19 school closure.

[299] e.g. 'Digitaliada', 'Atelierul Digital', 'InfoEducation', 'Clasa viitorului', Educlick, etc.

[300] Primary and lower secondary

Digital infrastructure in schools lags behind, especially in rural areas. Compared to the EU average, substantially fewer schools are highly digitally equipped and connected. Only 14% of Romanian students in primary education (EU average: 35%), 16% in lower secondary (EU average: 52%) and 31% in upper secondary education (EU average: 72%) study in such schools (European Commission, 2019). Available data shows that, in 2017, 1 in 5 schools was not connected to the internet at all, of which only 5% in urban areas and 24% in rural areas (Ministry of Education and Research, 2018). The number of computers per school is 60% higher in urban areas than in rural areas, illustrating the broader rural-urban gap in education.

Figure 3 - Teachers' confidence in their digital competences, 2017-2018



Source: 2nd Survey of Schools: ICT in Education, based on the DigComp framework.

Box 1: Large-scale EU-funded programmes aim to improve the digitalisation of the education system

The 'WI-FI Campus' project is equipping at least 2 000 schools with the technical infrastructure necessary to use open educational resources and 4 500 gymnasiums with wireless equipment. The project is co-financed by the European Regional Development Fund (ERDF) (EUR 38 million).

The 'Electronic Catalogue[301]' (EUR 40 million co-funding from the ERDF) will then help implement online enrolment in high school, electronic class registers and the online evaluation of written national examinations.

On resources, the 'Digital platform with open educational resources' (ERDF co-funding of EUR 41 million) will facilitate free access to electronic textbooks, while the 'CRED project', co-financed under the European Social Fund (ESF), helps develop online educational resources.

Despite measures to mitigate the impact of COVID-19 in education, the shift to distance learning risks worsening already high inequalities. Following the closure of schools, the Ministry of Education and Research organised online trainings for teachers and provided free access to educational platforms. Classes were also web-streamed on national television. A number of initiatives involving the private sector and NGOs have sought to support online teaching and equip students with devices. EUR 31 million were earmarked to purchase 250.000 tablets with internet connection, though with some delays in the process. Guidance was issued to teachers on addressing learning gaps accumulated during the school closure. A recent online survey (National Centre for Policy and Evaluation in Education, 2020) shows that 96% of respondent schools provided distance learning, in a combination of synchronous (real-time) or asynchronous (i.e. content on platforms, emails) format. 94% of respondent students took part in distance learning. Nevertheless, parents' responses showed that this happened with a varying degree of frequency,

[301] Sistem Informatic pentru Managementul Şcolarităţii (SIMS).

while teachers' responses indicated a varying coverage of subjects and of the curriculum. Two thirds of teachers declared that all students engaged in distance learning; more than 20% stated that more than half of their students engaged, and the rest reported that fewer of their students engaged. The mobile phone was used by about 90% of respondent students; about half used a dedicated computer/laptop, while one fifth shared a device. Lack of devices impacted particularly students from rural areas, from professional education (ibid.) and more generally students from disadvantaged backgrounds, including Roma. 38% of respondent teachers had to share a device with family members, while 11% do not own a device. The same percentage had poor internet connections, particularly in rural areas. In 2020, the Council of the European Union adopted a country-specific recommendation calling on Romania to 'strengthen skills and digital learning and ensure equal access to education' (Council of the European Union, 2020).

4. Investing in education and training

Romania's expenditure on education remains among the lowest in the EU. The latest available data shows that, in 2018, general government expenditure on education had increased in real terms by 6.4%, equivalent to 3.2% of GDP. This level of spending is significantly below the EU average of 4.6% and one of the lowest in the EU. Compared to 2010, expenditure on education remained broadly stable, recording real growth of only 1%. Nevertheless, by level of education there has been a shift from tertiary education (-19%) and pre-primary and primary education (-16%), to secondary education (+28%). Under-investment is still particularly felt in pre-university education and funding mechanisms to support equity remain weak. Although the relationship between spending and educational outcomes is not linear, Romania's low spending on essential public services, most notably on education, means that socio-economic background has a pivotal impact on human capital outcomes (World Bank, 2020).

5. Modernising early childhood and school education

Efforts are being made to improve the quality of services in early childhood education and care but participation rates are still low. The latest available data shows that the rate of participation in early childhood education for children between the age of 4 and the starting age of compulsory education declined to 86.3% in 2018. This is significantly below the EU average of 94.8% and the EU benchmark of 95%. Participation rates are low in rural areas and for the Roma (FRA, 2016). The participation rate in childcare (ages 0-3) was 15.1% in 2019, significantly below the Barcelona target of 33%, also due to insufficient availability of facilities. To improve quality, a new pre-school curriculum was introduced in 2019. The ESF is supporting the development of a strategy for early education and a framework regulation setting clear organisation and functioning rules. New accreditation standards for pre-school education have been developed and are expected to be adopted by the end of 2020.

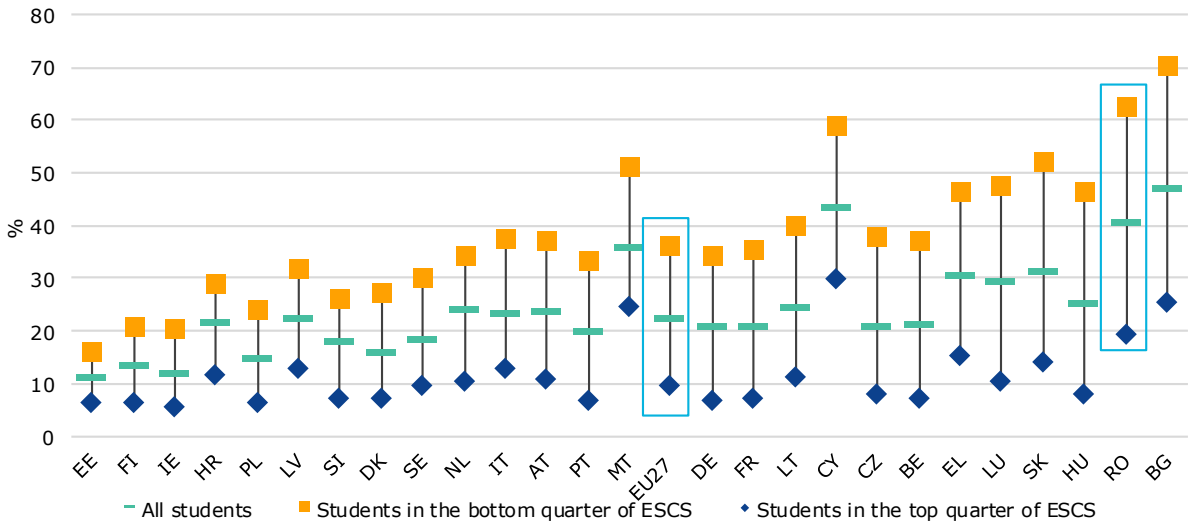
Early school leaving has dropped but remains high. The proportion of early leavers from education and training among 18-24 year-olds decreased for the fourth consecutive year. Nevertheless, at 15.3% in 2019, the rate remains one of the highest in the EU, significantly above the EU average (10.2%) and Romania's 2020 target (11.3%). Echoing wide disparities in access to quality education and socio-economic factors, early leaving is particularly high in rural areas (22.4 %) and among disadvantaged groups, including the Roma (FRA, 2016). In practice, there is still no integrated national approach to prevent and tackle the structural problem of early school leaving, although some measures are in place. These include EU-co-funded second chance programmes and integrated projects in several schools in disadvantaged and marginalised communities, as well as nationally-financed social assistance measures. The warm meal pilot project was recently extended from 50 to 150 schools. The early warning mechanism will be piloted in 10 counties, providing hands-on support to selected schools and support to stakeholders at national, regional and local level, with a view to scaling-up the project at national level.

The percentage of low achievers in reading, mathematics and science is very high and the situation has not improved. The 2018 OECD Programme for International Student Assessment (PISA) shows that 40.8% of Romanian 15 year-olds had difficulties understanding texts of moderate length and complexity or unfamiliar material (OECD, 2019b). 46.6% had

difficulties in interpreting and recognising how simple situations can be represented mathematically, while 43.9% did not have a level of basic knowledge in science. These rates of underachievement are among the highest in the EU and about twice the EU average (22.7% for reading, 22.9% for mathematics and 22.3% for science). In all three domains, the mean PISA score of Romanian students was about 60 score-points below the EU average, equivalent to one-and-a-half years of schooling. Compared to 2015, Romania's performance has not improved in reading or in science and has worsened considerably in mathematics[302], reversing some of the gains observed between 2006 and 2015 (OECD, 2019c). The proportion of high achievers, i.e. students who demonstrated complex knowledge in the subjects tested, is very low, significantly below the EU average: 1.4% in reading (EU average: 8.5%); 3.2% in mathematics (EU average: 11%); 1% in science (EU average: 6.3%). The impact of the ongoing curricular reform – which shifted the learning approach from content to competences – will only be measurable starting from the next testing round (2022), when PISA will assess for the first time the competences of students who have followed the new curriculum. The PISA survey also showed that almost 45% of 15 year-olds feel that they do not belong at school. A third reported being bullied at least once a month and their performance was 40 score-points lower.

The learning outcomes of students from disadvantaged backgrounds and rural areas are significantly lower than the national average. While the mean PISA score of Romanian students from advantaged socio-economic backgrounds is only around the average of all students in the EU[303], they still outperform students from disadvantaged backgrounds by a large margin. In reading, this performance gap is 109 score-points, equivalent to more than two-and-a-half years of schooling. These figures show that challenges related to the quality of education go hand in hand with a lack of equity. The percentage of underachieving students in the bottom socio-economic quartile is particularly high, with 62% of disadvantaged pupils struggling in reading compared to 19% of their socio-economically advantaged peers. At the 2020 national evaluation at the end of eighth grade, 24% of candidates did not obtain the minimum grade of 5, of which 15% were in urban areas and 38% in rural areas. Furthermore, Romania has a strong intergenerational persistence of education, implying that students' final educational achievement is highly linked to that of their parents, which limits the role that education plays in bringing about equal opportunities (World Bank, 2020). In addition, Roma inclusion in education remains an important challenge. The methodology for monitoring school segregation, envisaged by the 2016 revised anti-segregation order, was adopted at the end of 2019, but to date there has not been a clear follow-up.

Figure 4 – Underachievers in reading by socio-economic status (ESCS), PISA 2018



Source: OECD 2019b, PISA 2018 Database. Note: the EU-27 average does not include Spain.

[302] The mean score decreased by 15 in mathematics, while the percentage of underachievers increased by 6.6 p.p. The changes for science and reading are not statistically relevant.

[303] 484 score-points in reading compared to 487 on average in the EU.

Strengthening the teaching profession remains a key priority for modernising the school system. Romania's aspirations to raise learning outcomes and develop a competency-focused student-centred approach to teaching and learning largely depend on its teachers (OECD, 2020). In October 2020, a pilot master's programme in pedagogics started in eight universities. It explores a new model of initial teacher education that could replace the current socio-pedagogical module, which offers very little practical preparation, especially in modern teaching techniques and inclusive pedagogy (OECD, 2017). However, with less than 30% of school teachers older than 50 and the overall number of teachers expected to decline in line with the student population, any reform of initial teacher education will only affect a minority of the profession in the next few decades (OECD, 2020). This implies that updating and modernising teachers' knowledge and skills will primarily be achieved by working with the existing teachers (ibid). Although a high percentage of Romanian teachers take part in professional development, the content and delivery of courses is not perceived as sufficiently adapted to their needs (ISE, 2018), and participation is often restricted by high costs (OECD, 2019a). At the same time, attracting highly motivated teachers to work in disadvantaged schools, including in rural areas, remains a key challenge.

6. Modernising vocational education and training

The attractiveness of vocational education and training (VET) has increased, but ensuring quality and labour market relevance remains a challenge. Compared to the 2011/2012 school year, the number of students enrolled in professional schools increased seven-fold. Of the 85 000 students pursuing this study field in 2019, 15% were enrolled in dual education. The number of new entrants to dual VET was almost three times higher than in 2017/2018, revealing strongly increasing interest among students and companies in this training path. In 2019, new six-month apprenticeship programmes became available for low-qualified people and for those who left school without any qualification. These programmes support integration in the labour market and do not require prior formal qualifications, while employers receive an incentive of about EUR 340 per month for each apprenticeship contract. However, the overall employment rate of recent vocational graduates suggests that the adequacy and quality of the training is insufficiently aligned to labour market needs (67.7% compared to the EU average of 79.1%). Furthermore, the PISA test showed a large performance gap between students in general and those in the VET strand (108 score-points).

Steps have been taken to continue VET remotely. A consistent part of the training component of VET programmes was taught online in partnership with companies, with a focus on development of skills and professional competences. Where needed, remedial practical activities were expected at the beginning of the school year. For students in final years who had not completed a practical period of their studies, online activities will be carried out to allow them to complete their training properly. Graduation exams for European Qualifications Framework (EQF) 3 and 4 training programmes were replaced by a student project in the field of study that was submitted for examination. For graduates from EQF 5, the written and practical part were equated with the final grades for the specialty modules obtained throughout the years of study and with the presentation of a report, which took place either online or face-to-face.

7. Modernising higher education

Although the demand for higher skills is increasing, the number of tertiary educated graduates is low and graduates' skills do not match labour market needs. Having a sufficient number of higher education graduates is important for productivity growth, innovation and competitiveness. However, according to EUROSTAT, in 2019, only 25.8% of Romanians aged 30-34 had a university degree, significantly below the EU average of 40.3% and the lowest in the EU. Nevertheless, the rate has increased significantly compared to 2009 (16.8%), even though it is still below Romania's national Europe 2020 target of 26.7%. A look at graduating cohorts shows that, in 2018, for every 1 000 people aged 20-29 there were 45 higher education graduates combined at bachelor's, master's and doctoral level. This number is significantly below the EU

average of 60[304]. In 2018, 28.1% of graduating students graduated in science, technology, engineering or mathematics (STEM), of which 5.8% in ICT. Although these proportions are among the highest in the EU, the actual number of professionals ready to enter the labour market is low. Furthermore, graduates' skills often do not meet the expectations of employers (see Box 2).

The number of students in higher education is shaped by demographic, educational and socio-economic factors. At the start of the 2019/2020 academic year, the total number of students enrolled in higher education had increased slightly compared to the previous year (by 1.8%). Still, this number was 38% lower than in 2011, and has dropped particularly in private universities, whose number has decreased sharply from 52 to 27. Influencing this downward trend are demographic factors, including emigration, but also high early school leaving rates, the low percentage of high-school graduates that pass the baccalaureate exam (64.5% in 2020), and a certain preference for studying abroad[305], whereas the number of foreign students is rather low (5.7% in 2018/2019). Among the 15 year-olds that sat the PISA test in 2018, 60% expect to complete higher education (EU average: 62.4%). However, only 33% of the poorest students expect to do so, compared to 87.3% of their more advantaged peers, which and is one of the biggest gaps in the EU.

Universities have moved to online examinations and admission due to COVID-19. Universities were in a better position to shift to remote learning thanks to the better availability of digital infrastructure and online platforms. Teaching and examinations were carried out mostly online, while practical examinations that required physical presence were postponed. To overcome learning gaps and compensate for practical training that could not take place online, universities planned to organise intensive recovery sessions. Most universities organised admissions online, taking into consideration students' grades and their result in the baccalaureate exam. Only for certain study fields, including medicine and pharmacy, were admission exams organised *in situ*.

8. Promoting adult learning

Several initiatives have been introduced to promote adult learning, but there is still little policy innovation in this area. In 2019, only 1.3% of adults had had a recent learning experience. This is one of the lowest levels in the EU, significantly below the EU average of 10.8%. In 2019, a methodology for managing the national register of qualifications was adopted to help bring the descriptions of all qualifications acquired through initial, continuing and tertiary education and training together in one place. In 2020, the national authority for qualifications launched a project to systematise and simplify registries for qualifications. There are limited resources for awareness campaigns, counselling services, or for setting up the proposed community centres for lifelong learning, although the necessary regulations were adopted in 2019. Ensuring skills development for a just transition will require sustained effort aimed at improving skills through quality upskilling and reskilling opportunities.

The acquisition of digital skills faces significant challenges, although some existing projects and planned initiatives seek to improve the situation. The Agenda for Competences for Romania for 2025 lists digital competences as a priority for connectivity and the labour market, as well as being key competences for life. In general, adults have to pay to acquire or improve their digital competences, unless they are taking part in dedicated projects or using open educational resources. Addressing training provision for all segments of the population (the elderly, people living in rural areas, or those in other vulnerable situations) systematically, including ensuring infrastructure and training of teachers for digital competences, remains a challenge. Steps have been taken during the COVID-19 crisis to make training courses available online. For example, in various counties, specialised ICT training providers run courses for different levels of digital competences, from basic skills to advanced programming.

[304] ISCED 5-8, which includes short cycle programmes.

[305] In 2018, 6.6% of upper secondary graduates from Romania finalised their studies abroad.

Box 2: The skills challenge

Romania has one of the lowest labour force participation rates in the EU and its working-age population has been declining steadily since 2008, while labour and skills shortages have been increasing (European Commission, 2020b). There is therefore a need to capitalise better on existing human resources and invest in the skills of the current and future workforce. However, the education and training system is struggling to provide the skills the country needs (World Bank, 2020), due to challenges linked to quality, equity and labour market relevance.

Early school leaving remains high, especially in rural areas and for the Roma. Many 15 year-olds, who are Romania's future workforce, do not have the basic skills that are required to solve the kinds of problems that are routinely faced by today's adults. Educational poverty is particularly acute among disadvantaged groups, thereby reinforcing social inequalities. The digital skills of the general population and among young people are lower than the EU average. Overall, less than a third of Romanians aged 16-74 have at least basic digital skills, compared to 58% on average in the EU.

The availability of tertiary educated professionals is restricted by the limited number of graduates and by emigration – almost 40% of Romania's higher education graduates aged 24-64 are estimated to have emigrated (World Bank, 2019).

There are significant skills mismatches, with a high proportion of people with tertiary education either over-educated for their occupations or employed in a sector that does not match their field of education (World Bank, 2020). Many employers view the curricula of secondary and tertiary education as being too abstract, with insufficient focus on the practical application of knowledge and problem solving and outdated teaching methods which are focused on memorisation rather than application, problem solving and team cooperation (ibid).

There is no skills forecasting system to feed into the planning of VET and higher education programmes, although one is expected to be developed as a pre-condition for using European Structural and Investment Funds (2021-2027). Despite the high need for training to keep up with trends in the economy and to improve the resilience of the workforce, participation in adult learning programmes is very low.

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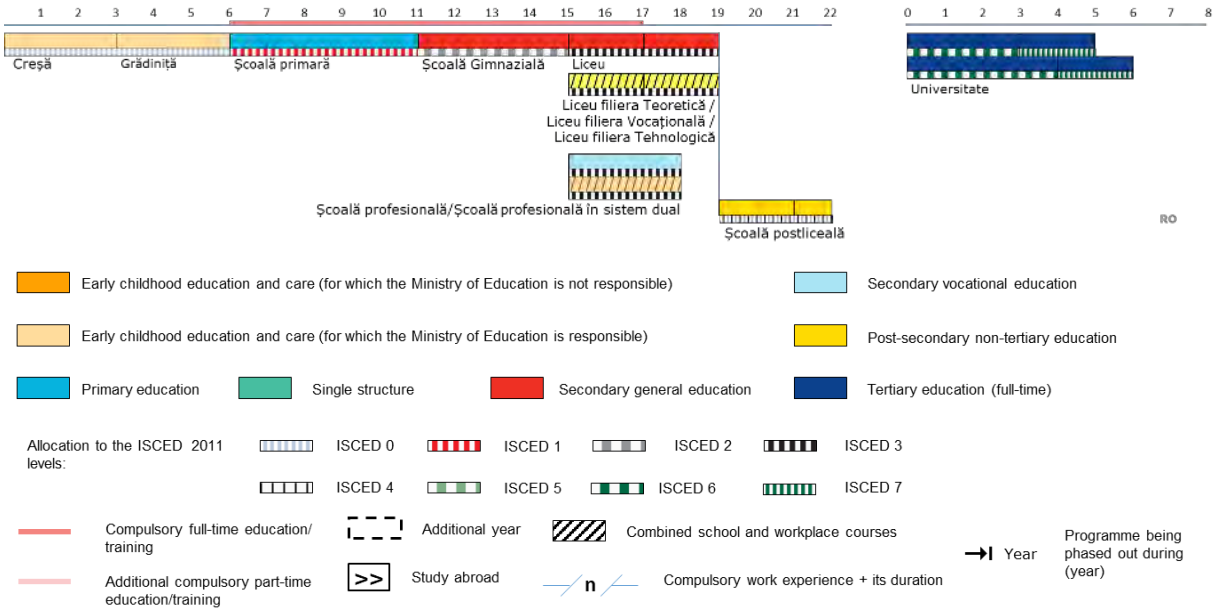
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Alexandra TAMASAN
Alexandra.TAMASAN@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

European Commission

SLOVAKIA

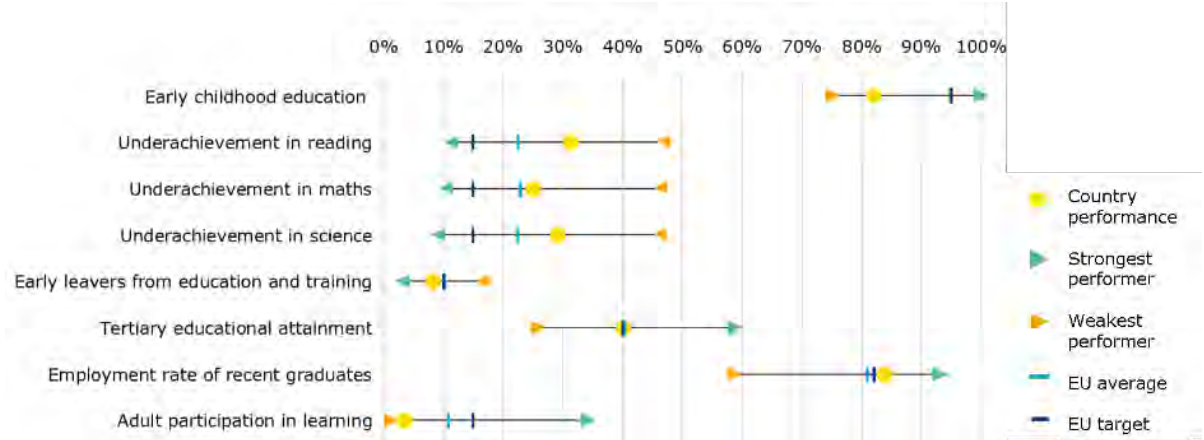
1. Key indicators

Figure 24 – Key indicators overview

			Slovakia		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			4.9%	8.3%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			17.6%	40.1%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			77.4%	82.2% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		22.2%	31.4% [18]	19.3%	22.5% [18]
	Maths		21.0%	25.1% [18]	22.2%	22.9% [18]
	Science		19.3%	29.3% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		74.4%	83.9%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		3.1%	3.6%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	15.7% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	: [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		4.5%	4.0% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	: [d, 12]	€4 499 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€3 907 [d, 12]	€5 102 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	: [d, 12]	: [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		4.9%	8.3%	12.6%	8.9%
	Foreign-born		: [u]	: [u]	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		17.5%	39.9%	32.0%	41.3%
	Foreign-born		: [u]	52.8% [u]	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		67.9%	84.8%	72.2%	75.9%
	ISCED 5-8		83.5%	83.4%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs; u = low reliability; : = not available; 12 = 2012, 16 = 2016, 17 = 2017, 18=2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- PISA 2018 results show persistently weak basic skills and a high level of inequalities, strongly linked to socio-economic background and regional disparities. From 2021, Slovakia plans compulsory pre-school education from age 5, which will particularly benefit vulnerable children.
- Digitalisation receives significant policy attention, but during the COVID-19 closure equal access to quality education was further hampered by a lack of adequate digital resources.
- Slovakia has reached the EU benchmark on tertiary attainment, but concerns persist about the quality of higher education. The employment rate of recent vocational education and training (VET) graduates is well above the EU average.
- Investment in education and training is low and inefficient, and has an adverse effect on learning outcomes.

3. A focus on digital education

Slovakia puts greater focus on digital competences, but regular policy evaluation is lacking. The broad 'Strategy for digital transformation of the Slovak Republic 2030[306]' and its 2019-2022 action plan outline the priority investment areas, including the adaptation of education and training for the digital age and enhancing competences for participating in digital society (digital citizenship) (Slovak Government, 2019). The current 2020 digital education strategy for school and higher education[307], which aims to improve access to digital educational content, modernise digital infrastructure and improve the competences of teaching staff, will be followed up by the 2030 strategy[308], which will additionally cover lifelong learning and cybersecurity. The level of digital skills in the wider population is comparatively low: in 2019, the proportions of the population (aged 16-74) with at least basic digital skills (54%) and above basic digital skills (27%) were below the EU-27 average (58% and 33% respectively) (European Commission, 2020b). The proportion of information and communication technology (ICT) graduates was slightly above the EU-27 average in 2018 (3.9% v 3.8%)[309]. Despite the improved focus on digital skills, there is no regular policy evaluation (European Commission/Eurydice/EACEA, 2019a), which could facilitate a more successful implementation.

While more young people have above basic digital skills, gaps are emerging. In 2019, the proportion of Slovaks aged 16-19 who reported having above basic overall digital skills had increased by 4 pps since 2015, reaching the EU-27 average of 57%. The proportion of those who considered their digital skills low has also increased to 16% (EU-27 15%). The 'IT Fitness Test' 2019 results indicate the need to improve critical thinking and evaluation of information, and highlight regional disparities in primary school pupils' digital skills (Kučera, P. et al., 2019). More than half of pupils at lower secondary (52%) and upper secondary (60%) level use a computer for learning purposes at least once a week at school (European Commission, 2019a), but 20% of secondary school students with disadvantaged backgrounds still lack access to a computer for schoolwork (OECD, 2020c). Given the strong influence of socio-economic background on secondary school students' learning results (OECD, 2019b; see section on PISA 2018 below), as well as regional disparities, expanded access to ICT for learning purposes for disadvantaged students and schools would be beneficial to prevent a digital divide (European Commission, 2017).

Appropriate support to teachers is crucial for digital education. Around half of teachers (47%) declare that they allow students to use ICT for class work (OECD, 2019a). However, the 2018 audit of lower secondary schools found that teachers used ICT mainly to present learning content, and that pupils rarely used it to enhance their knowledge (SSI, 2018). In addition to

306 https://www.vicepremier.gov.sk/wp-content/uploads/2019/06/Strategia-digitalnej-transformacie-Slovenska-2030.pdf

307 www.minedu.sk/informatizacia-a-digitalizacia-skolstva/

308 'School Informatisation Programme with a view to 2030' (Program informatizácie školstva s výhľadom do roku 2030)

309 Eurostat, UOE: [educ_uoe_grad03].

equipment and technical support, integration of ICT into teaching and a positive impact on learning outcomes depend on various factors, including appropriately designed curricula, teaching methodologies and teacher preparedness (Comi et al., 2016). In Slovakia, a majority of primary (63%) and lower secondary (62%) schools offer only weak support for digital education (EU-27 68% and 45% respectively) (European Commission, 2019a). Also, fewer teachers participate in subject-specific training on learning applications (European Commission, 2019a) while research shows that professional learning is most effective if it is linked to subject-specific and curriculum-relevant learning outcomes (Conrads et al., 2017). It is thus positive that Slovakia is developing ICT-supported methodologies for teaching school subjects with subject-specific training for teachers (Box 1). Evaluation of the project should provide further policy guidance on the use of digital technologies in education.

Box 1: Development of digital skills supported by the European Social Fund (ESF)

The objective of the 'IT Academy' is 'developing a model for education and training focused on informatics and ICT to meet current and prospective needs of a knowledge-based society and labour market'. The project aims to support the development of digital skills of primary and secondary school students, the integration of new technologies into teaching, and the development of university study programmes in data science, internet of things, computer networks and business information systems. Teachers are trained in innovative methodologies linking ICT and inquiry-based learning in different subjects aligned with the curricula.

The project will involve 33 000 primary and secondary school students, 3 000 higher education students, 2 100 teaching and non-teaching school staff and 20 university teachers. 500 teachers and 6 500 upper secondary students are expected to take free tests for the European Certificate in Digital Learning. A further 460 schools have joined the project with their own equipment. Based on its results, a new ICT curriculum for primary schools is to be implemented from 2021/2022.

The project is being run from September 2016 until October 2020 by the Slovak Centre of Scientific and Technical Information in partnership with five Slovak higher education institutions. Total budget: EUR 21 046 596.77.

See: http://itakademia.sk/zakladne-informacie/

Efforts have been made to equip schools and pupils with ICT infrastructure, but, they are still insufficient. Providing digital infrastructure to schools has been an investment priority over the years, largely supported with EU funds. In 2018, 55% of students at ISCED 2 level and 44% at ISCED 3 level attended highly digitally equipped and connected schools (EU averages 52% and 72% respectively) but the proportion of ISCED 1 students in such schools was only 17% (EU average 35%) (European Commission, 2019a). The closure of schools in the COVID-19 lockdown intensified the need for equal access to quality digital learning, to improve educators' digital skills, implement learning management systems, and provide support to disadvantaged families. Oonly 52% of children from poor households have internet access, and 28% have a laptop available; the proportions for Roma children are lower, at 40% and 21% respectively (Bednárik, M. et al., 2020). The Ministry of Education, in cooperation with non-governmental organisations, launched a website[310] supporting online learning. The IT sector[311] supported schools and teachers with software and digital solutions free of charge. Helplines were launched for parents and children in need of psychological or special educational support. The Ministry allocated EUR 500 000 for summer schools to compensate for educational losses caused by the school closure.

[310] www.ucimenadialku.sk

[311] https://www.slovensko.sk/sk/it-firmy-pomozte-slovensku

4. Investing in education and training

Investment in education and training remains comparatively low. In 2018, general government expenditure on education as a share of GDP remained below the EU average: 4% v 4.6%. Spending as a share of total public expenditure, at 9.5%, was also below the EU average (9.9%). Annual public spending per student in purchasing power standards remains among the lowest in the EU: in 2017[312], it was 4 348.5 for primary and lower secondary students, and 4 602.6 for post-secondary non-tertiary students. School principals overall report more material shortages than the OECD average, while those in disadvantaged schools report staff shortages more often than those in advantaged schools (OECD, 2019b Vol. II). However, higher investment alone is not sufficient to improve schools' and students' results; other countries with similar levels of cumulative expenditure per pupil achieve much better educational outcomes (European Commission, 2019d). Better efficiency and effectiveness of spending, and systemic changes to improve quality and equity along the lines put forward by MESA10 experts (Box 2), are needed. Under the 2014-2020 Operational Programme Human Resources, Slovakia earmarked approximately EUR 280 million (EUR 223.5 million from ESF) to finance additional staff at schools and kindergartens, yet with no clear vision on their post-project employment. A systematic approach to maintaining project results and evaluating the outcomes of ESF projects is needed to help guide further policy actions and achieve sustainable system-level measures.

Amid efforts to make education expenditure more effective, strengthened focus on vulnerable groups is needed. In 2019, the Ministries of Finance and Education carried out a spending review with ESF support. The government subsequently adopted a final report in March 2020 (MoF, 2020a). The review sets out measures to increase the inclusion of vulnerable groups, totalling EUR 262.8 million, of which EUR 107.1 million should be spent in 2021. Two thirds of the total package is intended for early childhood education and care (ECEC), especially for children from marginalised Roma communities. The review proposes ensuring early care to children below 3 living in such communities, increasing kindergarten facilities, strengthening inclusive teams, better support for disadvantaged students throughout the education process, piloting the adjustment of school districts to foster desegregation, measures to shift pupils from special to mainstream education, and related improvements in teacher training programmes. The 2020 national reform programme proposes defining standards for counselling services concerning disadvantaged children, including legal entitlement to such services. A new law on financing schools will be developed to increase the efficiency of the funds spent (MoF, 2020b).

The first action plan (2018-2019) of the 2018-2027 national programme for the development of education has been implemented. The key measures included introduction of compulsory education from age 5, efforts to improve continuing professional development of teachers, teachers' salary increases, in particular for new recruits, reform measures in higher education aiming to improve the quality assurance system, and the creation of the independent Slovak Accreditation Agency for Higher Education. The new law on pedagogical staff (Act 138/2019) introduced the function of a career counsellor in VET and modularisation of complementary pedagogical studies (Cedefop ReferNet, 2020). The proposals planned up to 2027 (second to fifth action plans) have been published[313].

Box 2: Supporting the debate on a comprehensive change in education — *Learning makes sense*

This project is a response to long-standing problems (increasing early school leaving (ESL) rate, low inclusiveness, poor educational outcomes, unattractiveness of teaching, low quality of tertiary education) and develops a comprehensive proposal for change to the system, as well as processes for change management.

The MESA10 think tank's proposal builds on the results of extensive research whose scope and approach was unique in Slovakia (421 individual and group interviews, 15 322 respondents). All relevant legislation and guidance in five thematic areas was analysed, covering content and form

312 Eurostat, UOE: [educ_uoe_fine09].

313 https://www.minedu.sk/17786-sk/narodny-program-rozvoja-vychovy-a-vzdelavania/

of education, selection, preparation and development of teaching staff, individualised support for learners, permeability and openness of the education system and governance and financing of education. Throughout the project, MESA10 experts engaged in active cooperation with practitioners and policy-makers. The intention of the project was to provide findings for further discussion on the education system and solutions to its weaknesses.

The project was implemented by MESA10 between May 2018 and May 2020, funded under Operational Programme – 'Effective Public Administration', with a budget of EUR 284 098.45.

See: https://en.todarozum.sk/

5. Modernising early childhood and school education

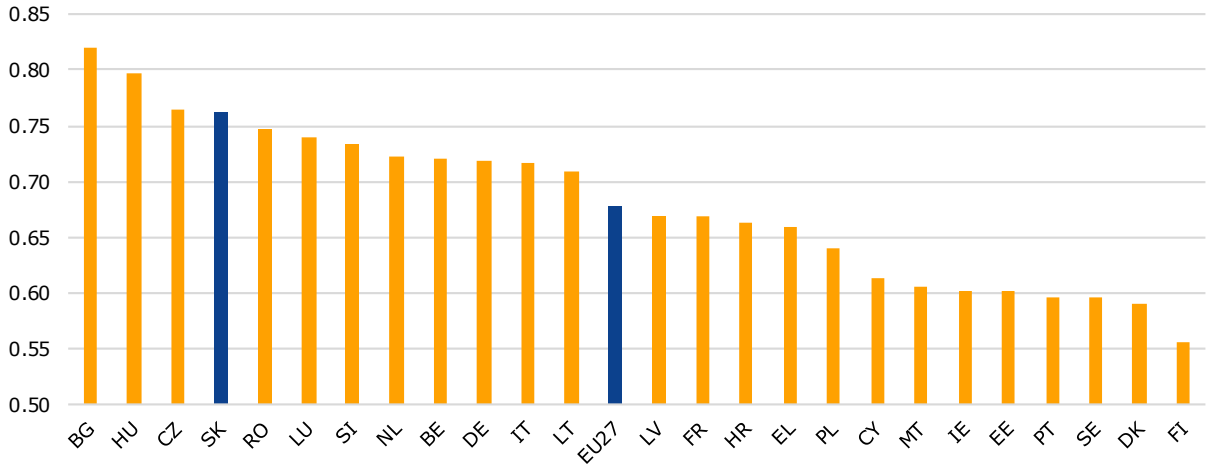
Slovakia aims to increase participation in ECEC; however, high quality and inclusiveness have to be ensured. After years of stagnation, in 2018 the participation rate of children over 4 increased by 4 pps compared to 2017, reaching 82.2% (EU-27 94.8%). In 2018, several new kindergartens and classes were opened (Eurypedia, 2020). However children from disadvantaged backgrounds attend ECEC less than their affluent peers, and often attend poorer-quality ECEC services (Frazer, H. et al., 2020). In 2018/2019, only 41% of children aged 3-5 from families receiving the 'benefit in material need' (2 pps less than in 2017/2018), and 32% of children aged 3-5 from marginalised Roma communities were enrolled in kindergartens (MoF, 2020a). Compulsory pre-school education for 5 year-olds will be implemented from 2021[314]. Creating a legislative framework for an integrated education system and care for children from 0-6 (MoF, 2020b) would facilitate decision-making and effective investment.

The OECD Programme for International Student Assessment (PISA) shows persistently low educational outcomes. According to the PISA 2018 survey, despite some improvement since 2015, notably in mathematics, Slovak 15-year olds' overall performance in all areas tested is still significantly worse than 2009 and below the EU average. The proportion of low achievers is significantly above the EU-27 average (31% v 22.5% in reading, 29% v 22.3% in science, and 25% v 22.9% in mathematics). The high rate of students who are underachievers in all three domains, at 17%, (EU-27 13.4%) is likely to translate into serious problems in further education and later in life (European Commission, 2019d). The particularly low share of top performers at 1.8% (EU-27 3.4%) suggests that the education system does not support high skills needs either.

Socio-economic status continues to have a strong influence on students' performance. More than half of all pupils in the bottom social quartile are low achievers (51.9% v EU 36.4%). The index of isolation of disadvantaged students from high achievers, at 0.76, is among the highest in the EU (Figure 3), indicating that disadvantaged students are unlikely to be in the same school as high-performing students, which may affect their performance. Socio-economic segregation across schools threatens social cohesion, and can also widen inequalities as disadvantaged students are more at risk of being left behind (OECD, 2019b Vol. II; Habodászová, Ľ., 2019). Fifteen year-olds from advantaged backgrounds outperformed those from disadvantaged backgrounds in reading by 106 points (EU-27 average 97 points), a gap which corresponds to more than 2 years of schooling.

[314] https://www.nrsr.sk/web/Dynamic/DocumentPreview.aspx?DocID=468868

Figure 3 - Isolation index of disadvantaged students from high-achieving students in reading, PISA 2018



Source: OECD, PISA 2018. Note: The EU average does not include ES. The isolation index of disadvantaged students from high-achieving students measures whether socio-economically disadvantaged students are concentrated in schools distinct from those that enrol high-achieving students. The index is related to the likelihood that a representative disadvantaged student attends a school that also enrols high-achieving students. It ranges from 0 to 1, with 0 corresponding to no segregation and 1 to full segregation.

Pupils' well-being at school requires more attention. More than one in four students (28.3%) reported being bullied at least a few times a month (EU-27 22.7%), and low achievers are much more exposed to frequent bullying than high achievers (39.8% v 18.6%). Furthermore, 31% of Slovak students do not feel part of a school community, which also affects their performance: on average they scored 21 points less in reading. Unfavourable school climate may also prevent development of children's social and emotional competences at school (European Commission, 2019d). In Slovakia, only 9% of pupils from the bottom social quartile are academically resilient (EU-27 11%), i.e. they have scored in the top quarter of performance in reading. The low level of resilient students in Slovakia is likely to be linked to the high isolation index (see above), as disadvantaged students are less likely to overcome the odds against them and to perform well at school.

Systemic solutions are needed to address the increasing rate of early school leavers. Unlike the EU trend, Slovakia's early leavers from education and training rate has strongly deteriorated to 8.3% in 2019 (EU-27 10.2%) from a low base of 4.9% in 2009 (EU-27 14.0%). Eastern Slovakia has the highest rate (13.8%) and the rate in towns and suburbs has doubled from 5.1% in 2009 to 11.7% in 2019 (EU-27 11.2%). According to the 'assessment of the implementation of the 2011 Council Recommendation on policies to reduce early school leaving', while ESL is addressed in policies at national level and with ad hoc actions, there is a stark gap between policy and implementation (European Commission, 2019c). The 'OECD Skills Strategy: Slovak Republic' of January 2020 suggests that causes need to be analysed, and the 'Resort Information System' should be redesigned to be a fully-fledged early warning system (OECD, 2020a).

Slovakia plans to develop an inclusive education strategy. The proportion of pupils with special educational needs is among the highest in Europe, at almost 20% of primary school pupils. Some 5.9% of these pupils are educated in special classes or special schools (EU 1.6%). In several districts in eastern Slovakia, which have a large share of Roma, the proportion of primary school pupils in special schools for children with intellectual disabilities exceeds 10% (Hall, R et al., 2020). Systemic measures to prevent disproportionate placing of Roma children in special schools, Roma-only schools or Roma-only classes are lacking. The 2020 national reform programme aims to develop an inclusive education strategy (MoF, 2020b). A European Commission infringement procedure against Slovakia on the segregation of Roma children in education is ongoing. In 2020,

Slovakia received a country-specific recommendation from the Council of the EU to 'ensure equal access to quality education' (Council of the European Union, 2020)[315].

The attractiveness of the teaching profession remains limited, and teacher training lacks quality. Following salary increases in 2018-2020, the Ministry of Education estimates that teachers in public institutions will earn 73% of the average salary of other full-time employees with tertiary education. This is still far below the 2019 EU-23 average for teachers (OECD, 2020d). Low pay is the key factor discouraging potential candidates from entering the teaching profession, which is perceived as not sufficiently valued in society (Perignáthová M., 2019) Teachers' enthusiasm in teaching is the second lowest in the EU, affecting students' learning outcomes (OECD, 2019b Vol. III). According to the January 2020 'OECD Skills Strategy: Slovak Republic', the teaching workforce needs to be strengthened, including by modernising initial teacher education programmes, strengthening continuing professional development and enhancing teacher career advancement (OECD, 2020a). The higher education reform has not yet brought any change to initial teacher education.

6. Modernising vocational education and training

Slovakia aims to improve employees' adaptability to new labour market requirements. In 2019, the ESF project 'Sector-driven innovations for an efficient labour market in the Slovak Republic' was launched, focusing on both initial and continuing vocational education and training. In addition to supporting employees, it aims to contribute to the identification of skill needs by monitoring the demand of enterprises for skilled labour. With a budget of approximately EUR 20 million, project activities cover i) helping Sectoral Councils update job profiles and occupational standards included in the National System of Occupation, ii) creating a sector-driven lifelong learning system focusing on VET for both young people and adults and iii) providing comprehensive sources of information regarding skill needs (Cedefop ReferNet, 2020). A new upper secondary programme 'Intelligent and digital systems' was launched during 2019/2020. Graduates will be able to offer services related to internet of things and in support of smart factories, smart homes and smart cities (Vantuch, J.; Jelínková, D., 2019).

In 2018, total enrolment in upper secondary VET remained stable at 67.8%, well above the EU-27 average of 47.8% (UOE, 2018). Students enrolled in VET had some exposure to work-based learning (12% in 2017 compared to 11% in 2016). Most educational programmes provide some practical elements in the curriculum (UOE, 2017). In 2019, the employment rate of recent VET graduates at 84.6% continued to be well above the EU-27 average of 79.1% (LFS, 2019).

Due to COVID-19, the school calendar for VET has been extended. Also, flexibility has been allowed regarding practical experience in the workplace, and work-based learning modules will be exceptionally integrated with a project module so that the work environment-related objectives can be addressed. During practical exams, the evaluation of practical experience uses different instruments flexibly to show that the students have reached the objectives included in the evaluation criteria. The proposed flexibility enables regional educational authorities and teachers to find the most appropriate means for each case and situation. Entrance exams to access intermediate or higher vocational training for those who do not have the academic requirements were postponed until the first half of July and later.

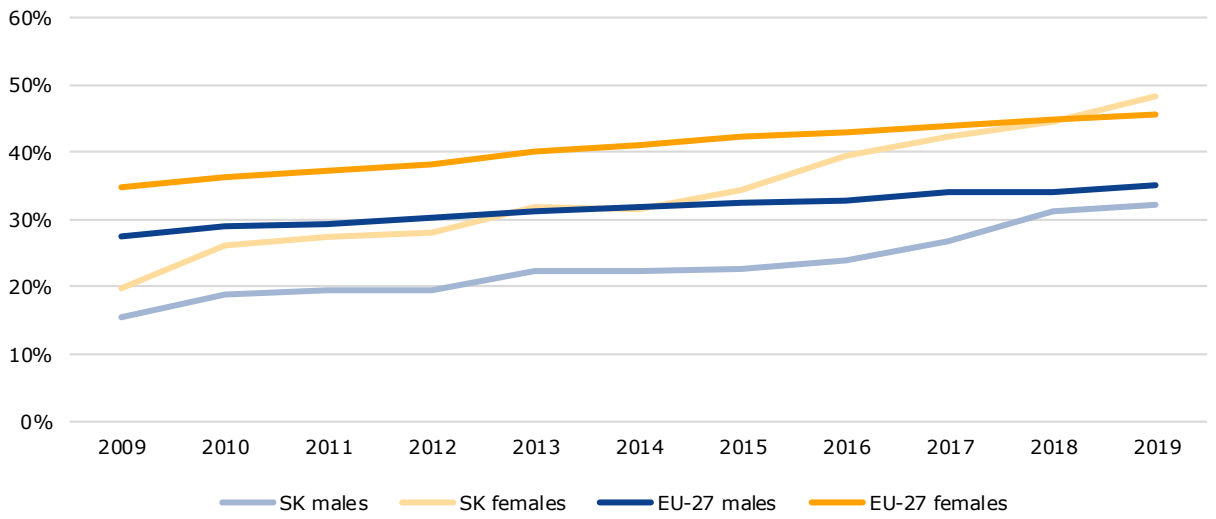
7. Modernising higher education

Slovakia has reached the EU benchmark on tertiary attainment, but disparities are widening. Following years of steady growth, in 2019 Slovakia's tertiary educational attainment rate reached 40.1%, in line with the EU-27 average (40.3%). However, the gender gap in favour of women has quadrupled over the past decade from 4.3 pps in 2009 to 16.1 pps in 2019 (EU-27 10.5 pps). The attainment rate for Slovak men thus remains below the EU-27 average (32.2% v

[315] https://ec.europa.eu/info/publications/2020-european-semester-country-specific-recommendations-commission-recommendations_en

35.1%) (Figure 4). The attainment gap between individuals living in rural areas and cities has also widened from 18.2 pps in 2009 to 35.5 pps (EU-27 22.1 pps).

Figure 4 - Tertiary attainment rate (30-34) by gender, 2009 - 2019



Source: Eurostat, LFS, [edat_lfse_03].

The employment rate of recent tertiary graduates has increased, while the proportion of science, technology, engineering and mathematics (STEM) graduates remains unchanged. In 2019, the employment rate of recent tertiary graduates (aged 20-34) reached 83.4%, reducing the gap to both the EU average (85.0%) and the higher employment rate for upper secondary VET graduates (84.6%)[316]. The proportion of STEM graduates remains limited at 22.6% in 2018 (EU-27 25.4%), essentially unchanged since 2013. The proportion of women among graduates in natural sciences, mathematics and statistics (65%) is one of the highest in the EU; however, it is among the lowest in ICT[317], at 15%. The 2020 national reform programme aims to increase the number of professionally-oriented bachelor programmes, including with ESF support, which should improve the overall employability of graduates. During the COVID-19 lockdown, higher education institutions (HEIs) switched to digital learning, but its effectiveness is not yet known.

Slovakia continues its reform measures to boost the quality of higher education. Slovak HEIs rank low internationally (Times Higher Education, 2020). Weaknesses result from factors such as fragmentation, low teaching quality, and limited internationalisation and job market orientation (European Commission, 2019b). Based on the legal framework adopted in 2018[318], Slovakia is establishing a new system of accreditation and aims to increase the importance of quality assurance. The new Slovak Accreditation Agency for Higher Education, which is operational since January 2020, is developing internal quality assurance system standards, study programme standards for accreditation, and standards for awarding the degrees of 'docent' and 'professor'. The Student Council for Higher Education presented four pillars to improve higher education: social support, education, infrastructure, and science and research[319]. The Council advocates bringing quality assurance into line with Standards and Guidelines for Quality Assurance in the European Higher Education Area.

316 UOE, LFS: [edat_lfse_24].

317 Eurostat, UOE: [educ_uoe_grad02].

318 Act No 269/2018, the amendment to Act No 270/2018.

319 Student Council news, 23 January 2020: https://srvs.eu/2020/01/22/navrhy-na-zvysenie-kvality-vysokoskolskeho-prostredia/

8. Promoting adult learning

A comparatively small share of adults (8.6%) has not acquired at least an upper secondary qualification, compared to an EU-27 average of 21.6% (LFS, 2019). The likelihood that adults in Slovakia will frequently update their knowledge and skills through adult learning is low: only 3.6% of adults aged 25-64 have had a recent learning experience in the past 4 weeks (EU-27 10.8%) (LFS, 2019). Slovakia has launched upskilling initiatives, particularly in validation. The objective of the ESF project 'System of verifying qualifications' (2019) is to set up a comprehensive system by establishing structures and mandatory procedures for lifelong learning, with an emphasis on the validation and recognition of qualifications, and piloting the validation system for non-formal and informal learning of approximately 300 qualifications, including validation of partial qualifications. This 4-year project also aims to complement the existing qualification standards of the National System of Qualifications by introducing assessment procedures. It is expected that these qualifications will be recognised by the Ministry of Education, certifying professional competences in line with Lifelong Learning Act (568/2009) (Cedefop ReferNet, 2020).

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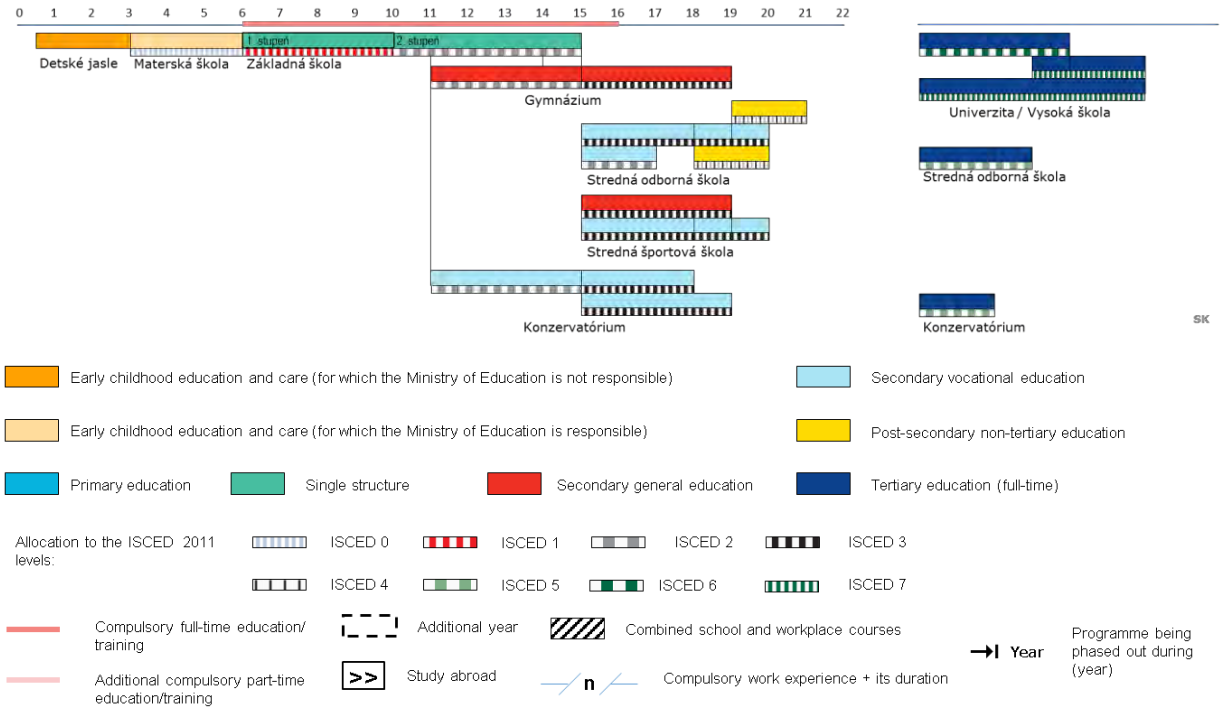
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Sylwia SITKA
Sylwia.SITKA@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

European Commission

SLOVENIA

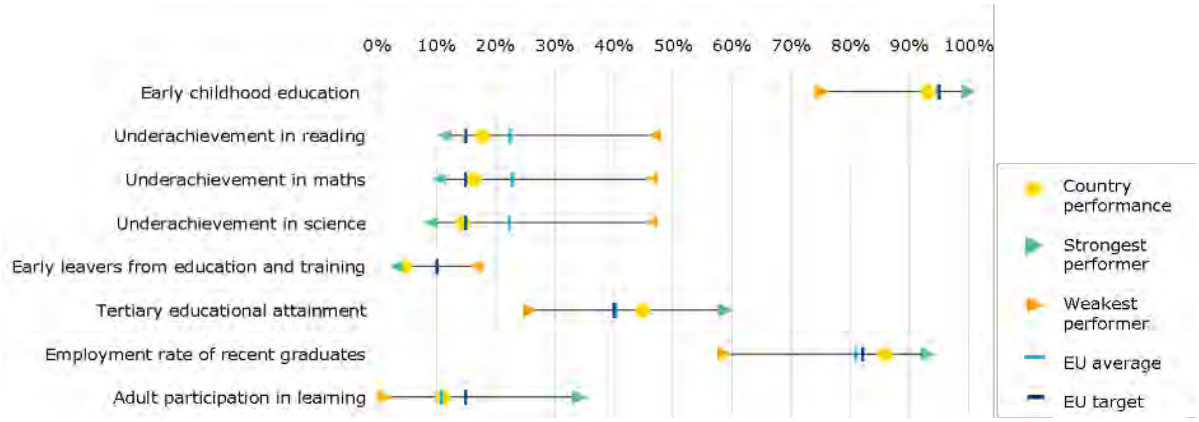
1. Key indicators

Figure 25 – Key indicators overview

			Slovenia		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			5.3%	4.6%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			31.6%	44.9%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			87.7%	93.1% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		21.2%	17.9% [18]	19.3%	22.5% [18]
	Maths		20.4%	16.4% [18]	22.2%	22.9% [18]
	Science		14.8%	14.6% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		82.3%	86.0%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		14.8%	11.2%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	4.0% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	: [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		6.6%	5.4% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€7 207 [12]	€6 801 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€5 353 [12]	€5 672 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€8 359 [12]	€9 510 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		5.0%	4.0%	12.6%	8.9%
	Foreign-born		13.0% [u]	11.6% [u]	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		32.2%	47.1%	32.0%	41.3%
	Foreign-born		21.0% [u]	25.8% [u]	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		73.3%	79.0%	72.2%	75.9%
	ISCED 5-8		88.7%	89.6%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs; u = low reliability; : = not available; 12 = 2012, 16 = 2016, 17 = 2017, 18=2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Investments prompted by the COVID-19 pandemic are well targeted.
- Pupils perform above the EU average in all three skills in PISA, though results in science and reading have decreased.
- Gender gaps and gaps between native born and pupils with migrant background are pronounced at all levels of education.
- The downward tertiary enrolment trend is continuing.

3. A focus on digital education

Digital skills are integrated into school education and the digital skills of young people are better than the EU average. Among 16-19 year-olds, 8% have low, 21% basic and 72% above basic overall digital skills, better than the respective EU averages (15%, 25% and 57%)[320]. According to the Digital Economy and Society Index (DESI) the share of information and communications technology (ICT) graduates in the total graduate population, at 3.5%, is relatively low[321]. ICT is integrated into compulsory subjects in schools (European Commission, 2019b), and informatics is an obligatory subject in the first grade of general secondary schools (60 hours) and in technical vocational and educational training (VET) schools (but not other VET schools). It is tested after secondary school in paper-based tests (European Commission, 2019b). Informatics and computer science are elective baccalaureate subjects. In 2016/2017, 17% of pupils in grades four-six of primary school chose optional informatics (RINOS 2018, p. 27). Students in upper secondary school are slightly more confident of their digital competencies than the EU average (European Commission, 2019), but this is not supported by the results of national tests, which suggest that students demonstrate only basic digital competencies (RINOS, 2018). In 2020, Slovenia received from the Council of the EU a country-specific recommendation to 'strengthen digital skills' (Council of the European Union, 2020).

Gender gaps in ICT are apparent. Gaps between girls and boys in schools are much higher than the EU average (e.g. at lower secondary school 18 pps more girls never code, compared to 6 pps in the EU) (European Commission, 2019). The gender gap in ICT employment is somewhat higher than the EU average; the percentage of ICT specialists in the labour market is a bit above the EU average (3.8% v 3.7%) and the female share a bit lower (1.3% compared to 1.4%)[322].

Students attend schools that are better digitally equipped than the EU average, but digital policy and support are weak. Students at all levels attend better digitally equipped and connected schools than the EU average (e.g. 89% compared to 72% for upper secondary schools), especially for high-speed connectivity (70% of upper secondary schools; EU average 18%) (European Commission, 2019), but connectivity is lower in remote areas. However, according to PISA, students in Slovenia report one of the lowest rates of ICT availability for their use at school (European Commission, 2020). Policies exist at national level for investments in school digital infrastructure and for development, availability and quality of digital learning resources (European Commission, 2019b), but few schools have ICT strategies (much lower than EU average at all ISCED levels) (European Commission, 2019), although primary schools have ICT coordinators.

Teachers are confident of their ICT skills, but do not use them much. There is no obligatory ICT training in initial teacher education (ITE), but teachers' digital competencies are assessed before entry into the profession. Training (often online) is provided in continuing professional development (CPD), for which the need is defined in the general teacher competence framework and assessed through the European self-assessment tool TET-SAT (European Commission, 2019b). Very few teachers report a high levels of need for this kind of CPD (8.5%; EU-22 18%). In the past 2 years, fewer than the EU average have participated in ICT-related professional training

320 Eurostat: [isoc_sk_dskl_i].

321 DESI.

322 DESI.

(European Commission, 2019). A majority report that they feel well prepared to use ICT in teaching (67% compared to EU average 37.5%) (OECD, 2019b), though the crisis showed insufficient knowledge. However, according to the Index of Readiness for Digital Lifelong Learning, most teachers are not digitally enabled and skilled, especially in primary and secondary education. Older teachers' digital competencies need improvement, and primary and secondary school teachers need to use digital methods more (CEPS, 2019). The percentage of teachers who let students frequently or always use ICT for projects or class work is 36.5%, one of the lowest in the EU (EU-22 46.9%) (OECD, 2019b).

The COVID-19 response was effective, even if somewhat delayed by the change of government. Slovenia already had the digital teaching materials, created mostly in 2005-2015 (Čuk, A. et al., 2014), networks for the exchange of good practice available on the i-ecosystem web-page[323], and good infrastructure. The change of government during this period led to some changes in instructions[324] and there was a strong reliance on voluntary help[325]. Pupils asked for clearer guidance and more harmonised coordination of schools' actions[326]. However, distance education seemed to function well in most cases, with both teaching materials[327] and lessons for teachers on how to provide online teaching[328] provided on the central web-site (which also enabled online classrooms, teachers' collaboration, professional development and tools)[329] and other relevant sites.

4. Investing in education and training

Slovenia invests more in education and training than the EU average, though spending is still lower than before the previous economic crisis. In 2018, Slovenia spent 5.4% of its GDP on education, compared to the EU-27 average of 4.6%. This is still lower than before the previous economic crisis, when it was 6.5%, but increases are planned in the budget for the next 2 years (Proračun, 2019), and spending increased by 3.2% between 2017 and 2018. The share of total general government expenditure spent on education (12.4%) is also above the EU-27 average (9.9%)[330]. The shares for pre-primary, primary and tertiary education are higher than the EU-27 average (37.9% v 34.1% and 17.7% v 16.4%[331]). Investment in higher education has increased since 2017 (in 2019 it was 7.5% higher than in 2018), towards the target of one percent of GDP (NRP 2020, p. 35).. Due to the impact of the COVID-19 pandemic, the remaining EU Structural and Investment funds for 2014-2020 (EUR 280 million) are being reallocated under the Coronavirus Response Investment Initiative to areas with pressing needs, including education, where they will target remote learning infrastructure to help students and teachers without requisite equipment (NRP 2020, pp. 40-41).

Issues raised by the Constitutional Court's decision on public funding of private primary schools have finally been resolved. In 2015, the Constitutional Court decided that all private basic school programmes should be 100% funded by the government, not 85% as regulated by law. This caused dissention, as this reduces funding for public schools, and diverging interpretations. In April 2020, the Constitutional Court clarified that this applies only to the obligatory part of their programme[332].

323 https://www.zrss.si/iekosistem/

324 https://www.gov.si/novice/2020-03-15-posebno-obvestilo-ministrice-dr-simone-kustec-o-varstvu-otrok/

325 https://www.gov.si/novice/2020-03-23-poudarki-dneva-z-ministrstva-za-izobrazevanje-znanost-in-sport-23-marec-2020/, https://www.gov.si/novice/2020-04-01-dostava-tablicnih-racunalnikov-in-modemov/

326 http://www.edusinfo.si/DnevneVsebine/Novice.aspx?id=261263

327 https://eucbeniki.sio.si/, https://eucbeniki.sio.si/, https://www.zrss.si/ucilna-zidana/ucbeniki-ucila

328 https://www.zrss.si/ucilna-zidana/izobrazevanje-na-daljavo, https://www.zrss.si/ucilna-zidana/predmeti-in-podrocja/predmeti-in-podrocja, https://www.zrss.si/professional-results/digital-bar, https://jazon.splet.arnes.si/, https://www.cmepius.si/ucenje-poucevanje-na-daljavo/

329 https://novice.sio.si/2020/03/14/enotna-vstopna-tocka-za-pouk-na-daljavo/

330 Eurostat, COFOG.

331 Eurostat, COFOG.

332 http://www.edusinfo.si/DnevneVsebine/Novice.aspx?id=261395

Government is making investments to address COVID-19 challenges. Due to the disruptions caused by COVID-19, the government has decided to support tertiary students who are not covered by pension and disability insurance with a one-off solidarity allowance of EUR 150[333]. EUR 1.42 million will be spent on co-financing the publication of bilingual textbooks and e-materials in minority languages (Italian, Hungarian and Roma), to ensure access to distance education. From EU funds, EUR 4 million will be used to fund tools to implement distance education and purchase 4 220 laptops for students and teachers who need them[334].

5. Modernising early childhood and school education

Participation in early childhood education is approaching the EU benchmark. Formal childcare attendance by children under 3 is high, at 46.3% in 2018 (EU-27 34.7%)[335]. Participation between age 4 and the beginning of compulsory primary education stood at 93.1% in 2018, one p.p. better than in 2017, but still below the EU benchmark for 2020 of 95% and the EU-27 average of 94.8%. Participation is low among children from low socio-economic background and from migrant families (European Commission, 2019c). In May 2019, an Amendment of the Law on early childhood education and care was proposed that, if adopted, would ensure quality and ban unregistered childcare, but it now has to be re-approved before parliamentary procedure due to the change of government

The education system responded well to COVID-19 closures but with some delays. Due to the COVID-19 outbreak, kindergartens and schools closed on 16 March and partially reopened on 18 May. Government decided not to provide ECEC for children of frontline workers[336], but some municipalities sent ECEC teachers into homes. Kindergartens otherwise provided online guidance and support to parents. There were delays in schools organising distance education (some schools started a week later). Seven hundred pupils of lower socio-economic background, initially unable to participate due to lack of internet or computer[337], were later provided with resources through donations[338]. In May 2020, around 1 000 primary school pupils (of mostly Roma and migrant background), corresponding to 0.5%, and around 1 000 secondary ones, corresponding to 1.3%, were not involved in distance learning and could not be reached (MESS, 2020). National external examinations at the end of sixth and ninth grade of primary schools were cancelled. For VET schools practical work will not be examined. Final exams (Matura) are taking place as normal with distancing measures. The practical part of school leaving exams is being assessed online or postponed.

Pupils perform above the EU average in basic competences, though mean scores for science and reading decreased and underperformance in reading has grown; early school leaving is low. The OECD's Programme for International Skills Assessment (PISA) 2018 shows that mean scores in all three skills assessed are above the EU average, and for mathematics are among the best in the EU (509 points; EU-27 492). Though good, mean scores for science (507 points; EU-27 487) and reading (495 points; EU-27 487) have decreased: science shows a continuous downward trend (-12 points since 2006), and reading has decreased by 10 points since 2015. The share of underperformers is also below the EU average in all three skills: mathematics 16.4% (EU-27 22.9%), science 14.6% (EU-27 22.3%) and reading 17.9% (EU-27 22.5%). It has increased by 2.7 pps for reading since 2015, while remaining largely stable for the other two fields. The share of top performers is above the EU average for mathematics and science, but below for reading (OECD, 2019, Vol. I). At 4.6% the early leavers from education and training rate is among the lowest in the EU (EU-27: 10.2%)[339] and below the Europe 2020 national target of 5%.

333 https://www.gov.si/zbirke/storitve/enkratni-solidarnostni-dodatek-studentom/

334 https://www.eu-skladi.si/portal/sl/ekp/izvajanje/izvedbeni-nacrt-operativnega-programa-za-izvajanje-evropske-kohezijske-politike-za-programsko-obdobje-2014-2020, https://www.eu-skladi.si/sl/dokumenti/inopi/inop_20_1_p.pdf

335 Eurostat, EU-SILC: [ilc_caindformal].

336 http://www.edusinfo.si/DnevneVsebine/Novice.aspx?id=259357

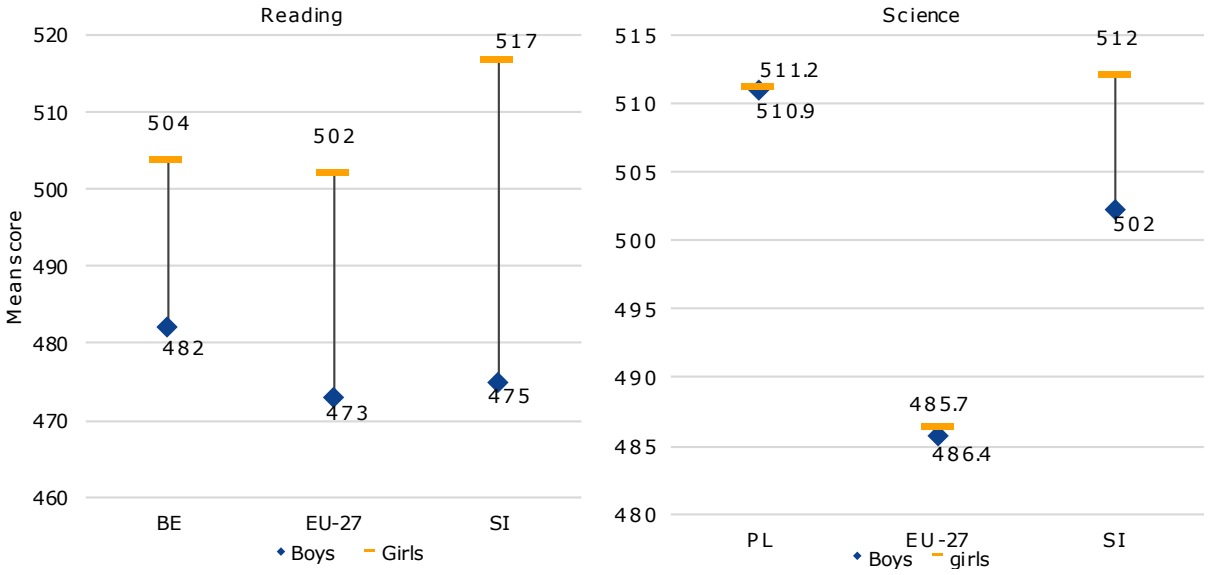
337 http://www.edusinfo.si/DnevneVsebine/Novice.aspx?id=260131

338 http://www.edusinfo.si/DnevneVsebine/Novice.aspx?id=260987

339 Eurostat, LFS: [edat_lfse_14].

The gender gap in reading and science is growing. The gender gap in the share of low achievers in all three fields is above the EU average and growing, with boys performing worse. The gap is particularly pronounced in reading (13.9 pps gap, 1.8 pps higher than in 2015; EU-27 9.9 pps), a bit less for science (4.4 pps, 2 pps higher than in 2015; EU-27 2 pps). The gender gap is also clear in mean scores: in reading it is one of the highest in the EU (42 pps; EU-27 28 pps) and in science above the EU-27 average (10 pps; EU-27 0.7 pp.) (OECD, 2019, Vol. II). Boys are almost twice as likely to skip school as girls (22.9% compared to 12.7%) (OECD, 2019, Vol. III).

Figure 3 - Gender gap in reading and science performance, PISA 2018



Source: OECD 2019, PISA 2018. The EU average in reading does not include ES results

Migrant background, socio-economic status and school characteristics significantly affect educational outcomes. The difference between the average reading performance of learners with a migrant background (8.9% of students) and that of native students is one of the largest in the EU (63 points; EU 44.9 points), and has grown by 12 pps since 2015. Students with a migrant background are also much more likely to underperform (35.8% compared to 15.7% for native born) (OECD, 2019, Vol. II) – among the biggest gaps in the EU. The gap between schools with many such pupils and other schools is one of the largest in the EU (55 points; EU 26 points). Pupils with a migrant background are much more likely to skip school than native born (9.8 pps difference) than is usual (4.9 pps EU-27 average) (OECD, 2019, Vol. III). In 2019, the number of hours of Slovenian language lessons available to students with a migrant background in the first year of education has increased significantly from 35 to a minimum of 120 hours per pupil (and up to 180 for bigger groups) (Okrožnica, 2019) as a means to facilitate their integration. The mean reading score of pupils from low socio-economic backgrounds is 80 points lower than that of high SES pupils, lower than the EU average of 95 points, but still significant. Pupils in cities score 33 points better than students from rural areas (OECD, 2019, Vol. III).

Further improvements are taking place in schools. From 2019/2020 pupils in the first three grades of basic school obtain textbooks and workbooks from schools for free, all older basic school students can borrow textbooks from school textbook fund. . An increase in the number of non-obligatory hours of physical training to improve health is being piloted in 144 primary schools. In December 2019, government adopted a National strategy for the development of reading literacy until 2030. It sets goals for different age and target groups (e.g. 90% of 15 year-olds with at least basic skills in PISA and 10% at highest levels by 2030). A National Reading Literacy Council of experts for all stages of education will be formed to help in implementation.

The share of young teachers is low, and they question their choice of career more than older ones. The share of new teachers in the workforce is the lowest in the EU (3.9%; EU-23

11.6%), while the share under 30 is below the EU average (6.4% v 7.4%)[340]. Teachers under 30 are twice as likely to doubt that they have chosen the right profession as teachers over 50 (19 pps difference, the second largest in the EU) and to wish to change school (12.8 pps difference; EU-23 6.8 pps) (OECD, 2019b, Vol. II). This suggests possible problems for the future renewal of the teaching workforce, though student enrolment in teaching studies is stable. While the law from 2018 specifies that teachers (except vocational subject teachers) need at least a master's degree, the proportion of schools with such teachers is very low (9.4%; EU-27 58.7%), and nearly twice as high for schools with advantaged pupils (13.2% compared to 7.2%) (OECD, 2019, Vol. II).

Box 1: Universities providing active support during COVID-19

In the University of Maribor, three faculties (Pedagogy, Science and Mathematics, and Philosophy) set up an educational support website for primary and secondary school pupils and teachers, called razlagamo.si, to help with distance education. The site contains a collection of materials and explanations for all primary and secondary school subjects, and provides possibilities for direct communication. The portal has a part for school teachers containing teaching materials and enabling them to collaborate, and a part for pupils. The pupils' section contains materials and video explanations and an area called Conversation (*Podporni pogovori ob težavah*) where they can individually ask questions that will be answered by volunteer students or university teachers.

https://razlagamo.si/

Medical students at the University of Ljubljana volunteered to help in hospitals and in homes for the elderly. Psychology students offered support services to the public through Skype and similar tools, and technical students produced masks and instructions for their making.

https://www.uni-lj.si/v_ospredju/2020041513181393/

6. Modernising vocational education and training

Both the proportion of upper secondary students in VET and the employment rate of VET graduates are very high. Total enrolment in upper secondary VET remained stable in 2018 compared to the previous year, with 70.9% of students at upper secondary level attending vocational programmes. This is among the highest shares in the EU and well above the EU average (48.4%). The employment rate among recent VET graduates saw a decrease, from 84.5% in 2018 to 79.1% in 2019, in line with the 2019 EU-27 average of 79.1%.

Implementation of the 2017 Apprenticeship Act continued. Slovenia continues to closely monitor implementation of the new apprenticeship programmes introduced in 2018/2019 and 2019/2020. In 2019, the second round of evaluation focused on the challenges and improvements of assessment in apprenticeship (Cedefop ReferNet Slovenia, 2020a).

The strategy 'Digital Slovenia 2020' aims for more inclusive digital skills development. It includes activities such as modernising organisation and data management in innovative learning environments (2016-2022) through supporting teachers and managers in administration and management. The Slovenian educational network SIO2020 aims to put in place wireless networks in schools, acquire ICT facilities, and develop and supply e-services such as e-classrooms and MOOCs.

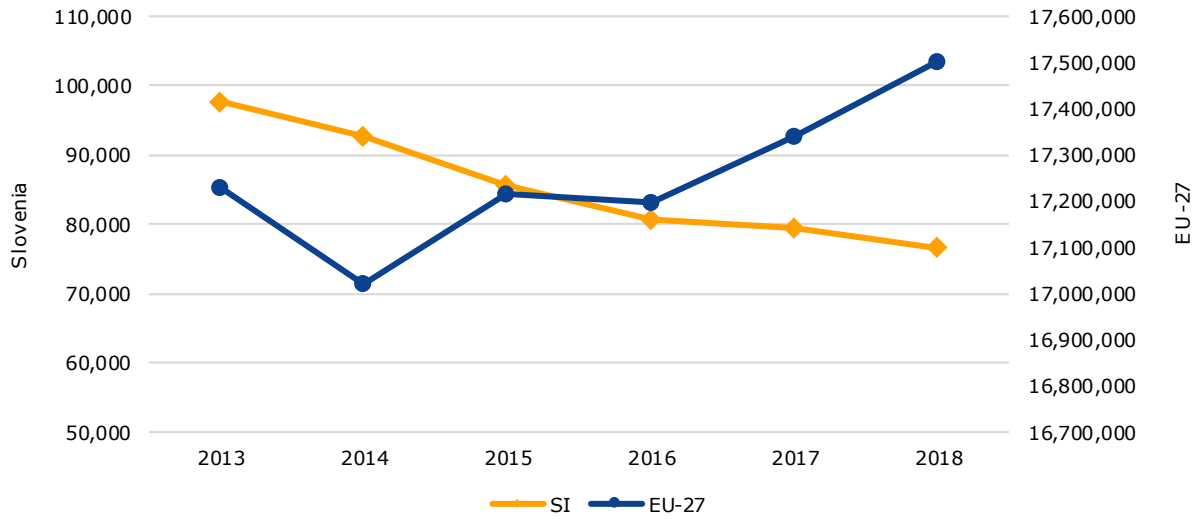
7. Modernising higher education

Tertiary attainment is above the EU average, but there are big gaps between men and women and between native and foreign born. Slovenia already achieved its national target of 40% tertiary educational attainment in 2013. In 2019, it was 44.9%, above the EU-27 average of

[340] Eurostat, UOE: [educ_uoe_perp01].

40.3%. The difference between the tertiary attainment of women and men (57.1% v 34.5%) is the second largest in the EU, a 22.6 pps gap compared to the EU average of 10.5 pps[341],[342].

Figure 4 - Student enrolments in EU-27 and SI, 2013 and 2018



Source: Eurostat, UOE, [educ_uoe_enrt02].

The downward trend in enrolments continues; the share of science, technology, engineering and mathematics (STEM) students is high. The number of students enrolled in tertiary studies is in a long-term decline (97 706 in 2013 v 76 534 in 2018)[343],[344]. This means that the number of students fell by 21.7%[345] in the period, which is partially explained by 8% reduction of population of enrolment age. The number of tertiary graduates in 2019 is the lowest for a decade. Most (84%) study in public institutions and the most popular subjects are business, administration and law (SORS, 2020). The share of students studying STEM is high (29.3%), with two thirds of them studying engineering, manufacturing and construction (18.4%) one of the highest such shares in the EU. STEM students constitute the largest group within short-cycle studies (35.4%)[346].

Employment rates for all recent graduates including tertiary graduates are above the EU average. The employment rate of all recent graduates (ISCED 3-8) in 2019 (86%) is above both the EU benchmark for 2020 (82%) and the EU average (80.9%). For tertiary graduates it is 89.6%, above the EU average of 85%[347]. Employment rates for both categories have been improving since 2014.

University studies successfully shifted to distance education during the COVID-19 lockdown. Universities were the first educational institutions to close due to the outbreak of coronavirus, a week before the others. They successfully made the transition to distance teaching (85% of the entire teaching programme)[348], with the only problem being lab work and practical exercises that cannot be done online. Their restart is planned after relaxation of measures or by September[349]. The University of Ljubljana reduced the requirements for advancement to higher

341 Eurostat, LFS: [edat_lfse_03].

342 This gender difference seems set to continue. Almost two thirds of students in Slovenia in 2017 were female (61.3%, v 38.7% of males).

343 Eurostat, UOE.

344 Causes for this have been analysed in detail in the last year's Education and Training Monitor chapter on Slovenia.

345 Eurostat, UOE: [educ_uoe_enrt02].

346 Eurostat, UOE: [educ_uoe_enrt04].

347 Eurostat, LFS: [edat_lfse_24].

348 http://www.edusinfo.si/DnevneVsebine/Novice.aspx?id=262404

349 http://www.edusinfo.si/DnevneVsebine/Novice.aspx?id=263607

years. The dates for new enrolment in higher education institutions were extended[350]. Universities restarted research work from 4 May.

Box 2: Innovative learning and teaching in higher education

An open call for development of innovative learning environments at all levels of education resulted in projects in three Slovenian universities (Ljubljana, Maribor and Primorska). They included preparation of professional bases for didactic use of ICT for teachers, recommendations for equipping schools with ICT and ensuring information support to teachers, strengthening digital competencies of student teachers, and modernising learning environments on pedagogical studies, resulting in some changes in curricula. The project targeted ITE, and through workshops, seminars and consultations trained higher education (HE) teachers and students in innovative didactic approaches and the integration of ICT into learning processes. The participants applied acquired knowledge to prepare new teaching approaches with the help of ICT technical support experts.

The project involved 256 HE teachers, of whom 238 were teaching on pedagogical study programmes, and 2 776 students - future primary and secondary teachers. Its results were helpful in dealing with the pedagogical challenges of the COVID-19 crisis.

Projects' duration: 1 April 2017 - 30 September 2018.

Call budget: EUR 1.3 million (European Social Fund)

Links to projects:

Ljubljana: http://ikt-projekti.uni-lj.si/GeneralANG.html,

Maribor: https://pef.um.si/raziskovanje-in-umetnost/zakljuceni-projekti/pikt-um/

Primorska: https://upbudi.upr.si/si/akadema/inovativne-in-prozne-oblike-poucevanja-in-ucenja-v-pedagoskih-studijskih-programih

8. Promoting adult learning

Participation in adult education is high, but that of the low-skilled needs improving. The participation rate of adults in lifelong learning slightly decreased to 11.2% in 2019, which is still higher than the EU-27 average of 10.8%. The biggest challenges are how to address target groups, fully meet goals and benchmarks and boost the globally low participation rate of the low-skilled and other vulnerable groups. Equally important is upgrading basic skills and competences and implementing publicly supported lifelong career guidance in companies. To enable lifelong career guidance development and adult learning the Ministry of Education, Science and Sport has invited public providers for adult Education to design a consortium of different partners (including companies) in different regions aiming to provide lifelong learning and career guidance for low-skilled and workers at risk jobs to raise their basic skills and vocational competences in tailor-made programmes. Slovenian Institute of the Republic of Slovenia for Adult Education (SIAE) provides all the professional support to the providers.

Slovenia continues to take steps to improve adult learning and the upskilling of workers, yet challenges remain. An important step is the design of the new National master plan for adult education (2021–2030). It will define the national policy for adult education and form the basis for concrete planning and to supplement the Adult Education Act. The 2017 'Slovenian development strategy 2030' strongly emphasises 'knowledge and skills for high quality of life for all'. Ten competence centres for human resources development and the strengthening of employees' key competences are being established. The Slovene VET Institute (CPI) developed new continuing VET programmes adjusted to employers' needs; more projects focusing on upskilling are ongoing. At the same time, implementation of the publicly financed 'Basic School for Adults' is hampered by low participation. Further development in recognition and certification of non-formally acquired

[350] http://www.edusinfo.si/DnevneVsebine/Novice.aspx?id=262965

knowledge, competences and skills also remains difficult. The impact of the COVID-19 pandemic will increase the need for upskilling and reskilling.

In Slovenia, investment in adult education remains a challenge and a priority. Low-skilled workers and older workers are the most vulnerable groups in the labour market and their unemployment rate is still relatively high, though decreasing. Technological changes will require a more highly-educated workforce and, taking into account that the 45+ age group will be at least 20 more years in the labour market, there is a need for better investments in adult education at all levels to avoid more vulnerable groups on the labour market in the near future.

Many initiatives, mostly based on online assessment, are being taken in response to the extended period of lockdown due to COVID-19. Most education processes shifted to remote learning, through different digital means and social media. A book addressing digital education for adults has been published recently (March 2020): 'E-education for Digital Society'.

In 2016, Slovenia presented Digital Slovenia 2020 – a strategy for the development of information society. The Digital Coalition is working on a coordinated digital transformation, coordinating policies and measures for capacity building, improving digital literacy across target populations, improving e-skills, e-inclusion and better integrating ICT in education and lifelong learning.

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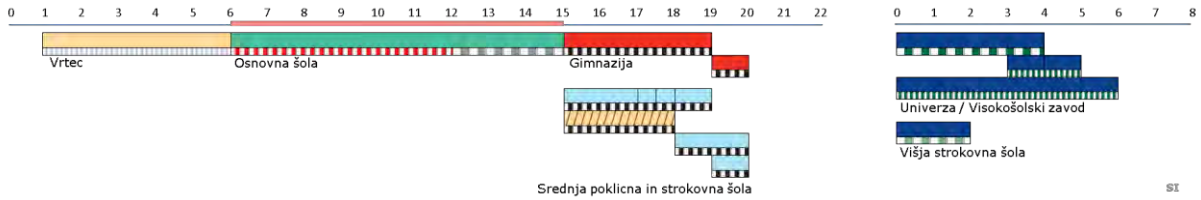
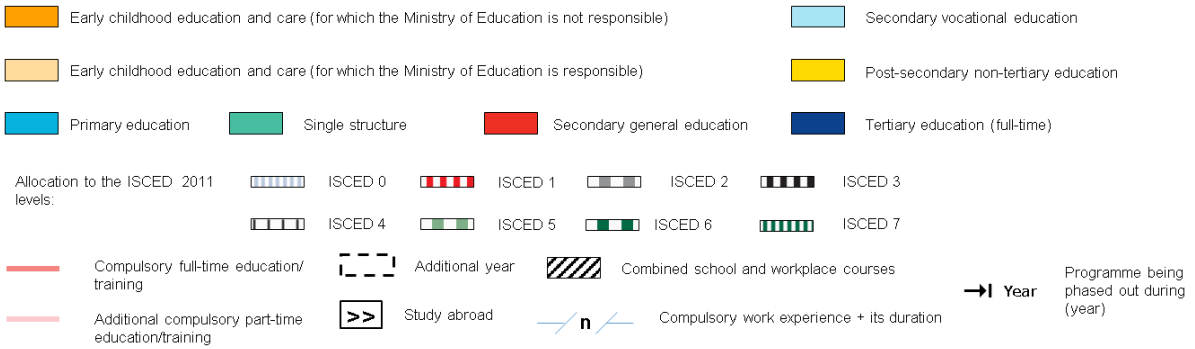
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system





Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Marina GRSKOVIC
Marina.GRSKOVIC@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

European Commission

SPAIN

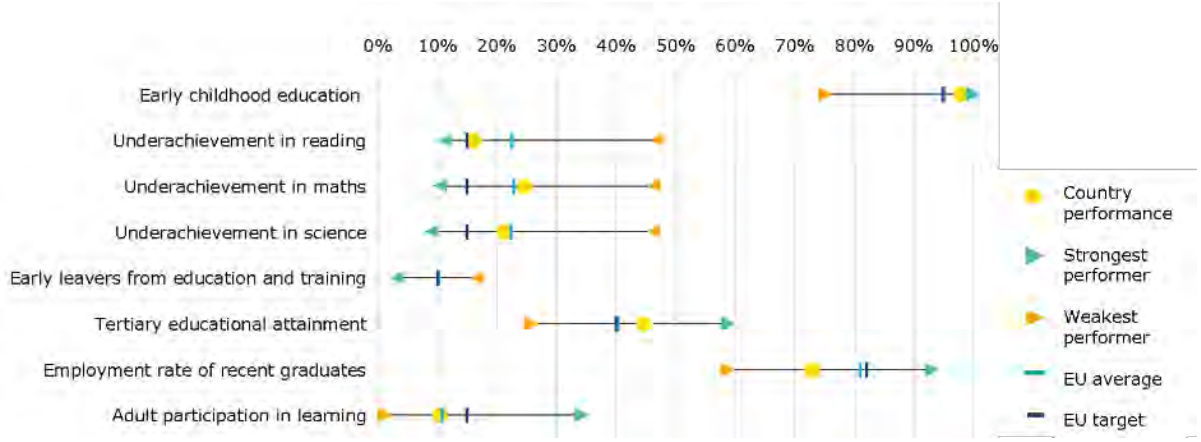
1. Key indicators

Figure 26 – Key indicators overview

			Spain		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			30.9%	17.3%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			40.7%	44.7%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			98.4%	98.0% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		19.6%	: [18]	19.3%	22.5% [18]
	Maths		23.8%	24.7% [18]	22.2%	22.9% [18]
	Science		18.2%	21.3% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		73.0%	73.0%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		10.8%	10.6%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	2.2% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	7.7% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		4.6%	4.0% [p, 18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€5 785 [12]	€6 006 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€6 775 [12]	€7 400 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€9 155 [12]	€9 300 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		27.7%	14.4%	12.6%	8.9%
	Foreign-born		45.2%	31.1%	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		45.8%	48.7%	32.0%	41.3%
	Foreign-born		23.9%	31.9%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		63.9%	61.5%	72.2%	75.9%
	ISCED 5-8		76.5%	77.2%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs; u = low reliability; : = not available; 12 = 2012, 16 = 2016, 17 = 2017, 18 = 2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Schools are well equipped with digital infrastructure and tools, but teachers' digital competences need to improve.
- A comprehensive reform of the education law is ongoing, and its success will depend to a large extent on reaching broad social and political consensus. Students' educational outcomes have not improved and regional differences persist. The pandemic crisis revealed a sharp socio-economic divide in students' access to digital technology.
- Career guidance and orientation are key to reduce skills mismatches. Tertiary graduate tracking is being developed.
- Low enrolment in vocational education and training (VET) persists. VET graduate tracking is under development.

3. A focus on digital education

The national education curriculum covers digital competences at all education levels. Digital competences are integrated either into other compulsory subjects in primary and lower secondary education, or as a compulsory separate subject in upper secondary (European Commission/EACEA/Eurydice, 2019), including VET. Since 2020, the Digitalization and Digital Competence Development Plan *(Plan de digitalización y desarrollo de la competencia digital)* aims at: improving the digital competence of students, teachers and schools, addressing the digital gaps;implementing the School Digital Plan *(Plan Digital de Centro*[351]*)*; and create digital Open Educational Resources. Besides, some Autonomous Communities have specific digital education strategies[352] or general digital strategies that cover education[353].

New digital education plan. *Educa en Digital*, launched in September 2020, complements the Digitalisation and Digital Competence Development Plan, with several actions focused in providing learning stations at home (digital devices with internet connectivity) and digital educational resources; adapting the digital competences of all teachers to the use of ICT in their daily work, as well as the development and application of teaching methodologies; the application of artificial intelligence to establish personalised learning paths. This plan is expected to be financially supported by the European Regional Development Fund (ERDF) with about EUR 261 million (around EUR 184 million of EU contribution). Around 600.000 students will benefit from the investment and help to reduce digital divide.

Teachers' digital competences are at EU average level. The Teaching and Learning International Survey (TALIS) 2018 (OECD, 2019a) reports that 68% of teachers were trained in the use of information and communications technology (ICT) in the past 12 months, a similar proportion to the average in TALIS 2013. 38% of teachers report that ICT was part of their training programme (86% among novice teachers). However, initial teacher education does not include specific ICT training among compulsory subjects. The share of teachers trained in the pedagogical use of ICT in teaching, on learning applications and use of ICT equipment is above the EU average in primary education but lower in lower and upper secondary education (European Commission, 2019a). 15% of teachers report in TALIS 2018 a high development need in this area (EU-22 average 18%). The self-assessed digital confidence of primary and secondary teachers is around the EU average (European Commission, 2019a). Within the *Aprende* initiative, the National Institute of Educational Technologies and Teacher Training (INTEF) provides continuing pedagogical development on digital education through tutored courses, and massive, nano and self-paced open online courses (MOOC, NOOC, and SPOOC respectively)[354].

[351] https://intef.es/wp-content/uploads/2020/07/2020_0707_Plan-Digital-de-Centro_-INTEF.pdf

[352] Andalusia, Castile and Leon, Catalonia, Galicia and Extremadura

[353] Basque Country and Valencia

[354] http://aprende.intef.es/

Box 1: A common digital competence framework for teachers

In line with the European framework on digital competence, INTEF, in collaboration with all Spanish regions, adopted in 2020 the 'Reference framework for the digital competence of teachers'[355] to enhance suitable digital competence of teachers and schools and improve teachers' performance in the use of ICT for teaching. The framework establishes 5 competence areas: 1) information and data literacy; 2) communication and collaboration; 3) digital content creation; 4) safety and 5) problem solving. For each competence, there exist three proficiency levels (basic, intermediate, advanced).

INTEF also developed a 'Teacher Digital Competence Portfolio'[356], which includes a self-assessment tool based on the TET-SAT (a tool developed as part of the MENTEP project supported by the Erasmus+ programme: http://mentep.eun.org/tet-sat). On a voluntary basis, teachers may assess their level of digital competence using this tool and thereby define their development needs.

Schools are digitally well-equipped. 100% of schools and 97% of classes have internet connections[357]. There is no significant difference in class-connectivity between public and private schools, but there is between regions[358]. 77% of schools have more than 20Mb broadband speed and 94.4% have Wi-Fi connections. In 2018-2019, there were on average 3 students per computer (2.8 in public schools, and 3.2 in private schools). In public primary education the ratio was 2.8, and 2.7 in secondary and VET. In small municipalities (below 1 000 inhabitants), the ratio drops to 1.4 (3.5 in big cities). However, there are large regional differences[359]. On average, 60% of classrooms have interactive digital systems, 89% of schools have an internet web page, and 45% have virtual learning environments. Since 2015, around 13 000 schools with 4 million students have received ultrafast broadband through the project 'Connected Schools' (*Escuelas Conectadas*[360]). This project, together with other investment in digital infrastructure in schools and universities, is supported by the European Regional Development Fund with around EUR 400 million.

Using digital means for teaching remains limited. The 2018 TALIS survey (OECD, 2019a) reports that 51% of teachers let students use ICT for project or class work (EU-22 47%), higher than in TALIS 2013 (37%). The share of students who use a computer at school for learning purposes is close to the EU average in lower secondary (49% v 52%) and upper secondary education (58% v 59%) (European Commission, 2019a).

Students' digital competences improve but they are less confident than their EU peers. In 2019, the proportion of 16-19 year-olds who reported having above basic digital skills increased compared to 2015 (67% v 58%). However, those reporting low digital skills also increased, from 9 to 12% (EU-27 averages 57% and 15% in 2019)[361]. Spanish students have slightly lower confidence than the EU average in lower and upper secondary education in almost all areas (data literacy and digital content creation, problem solving and safety), except for communication and collaboration (European Commission, 2019a). Guidance on the assessment of digital competences in the classroom is based on the learning outcomes outlined in national curricula, but some regions have developed their own guidelines (European Commission/EACEA/Eurydice, 2019). Spain does not use digital technologies in national tests.

355 http://aprende.intef.es/sites/default/files/2018-05/2017_1020_Marco-Com%C3%BAn-de-Competencia-Digital-Docente.pdf

356 https://portfolio.intef.es/

357 https://www.educacionyfp.gob.es/servicios-al-ciudadano/estadisticas/no-universitaria/centros/sociedad-informacion/2018-2019.html

358 Ranging from 99.9% (Valencia) to 84.0% (Aragon).

359 The Basque Country and Extremadura have the best ratio (1.5 and 1.7 students per computer respectively); Murcia (4.6) Madrid (3.9) and Valencia (3.9) have the least favourable ration of students per computer.

360 https://www.red.es/redes/es/que-hacemos/e-educaci%C3%B3n

361 Eurostat: [isoc_sk_dskl_i].

4. Investing in education and training

The education budget remains below the EU average. In 2018, Spain spent 4% of GDP on education, the same share as in 2017, and 9.6% as a share of total public expenditure (9.7% in 2017), both below the EU-27 averages (4.6% and 9.9%). Public spending on education increased by 1.9% between 2017 and 2018 in real terms (4.2% in tertiary education). Spending in pre-primary and primary education was 1.5% of GDP, 1.5% in secondary and 0.6% in tertiary. 68% of spending went on compensation of employees and 4% on gross capital formation[362] (EU-27 averages 65 % and 7%. The publicly funded private schools (*escuelas cooncertadas*)[363] receive 12.5% of the total education budget (around EUR 6.3 billion) and 4.4% of total spending goes on scholarships and study grants (MEFP, 2020a). Spain is the EU country with the highest share of private spending on education (19% of total), most of it in the form of household expenditure (17%)[364].

Investment in education decreased in the last decade. Over 2010-2018, general government education expenditure (in deflated values) decreased by 3% (-EUR 1.6 billion), with the highest reduction happening in tertiary education (56%, equivalent to around EUR 500 million)[365]. During the same period, EU-27 average education spending grew by 4% (2% in tertiary education). The major reduction in this period occurred in gross capital formation (-39%) and intermediate consumption (-22%). Compensation of employees (i.e. teachers' salaries) did not show any significant change.

5. Modernising early childhood and school education

Participation in early childhood education (ECE) is high. In 2018, participation of pupils from age 4 until the age of compulsory primary education (6) increased to 98%, above the EU average (94.8%)[366]. Participation in childcare among children under 3 was 50.5% (EU average 34.7%)[367]. Regional differences in participation persist.

There are plans to extend universal access to ECE for all children under 6. The government will put forward an 8-year rolling plan, in consultation with regional authorities. Some regions plan to use subsidies for private providers (Rioja), others to give direct grants to families (Andalusia) and others to invest in public provision and abolish fees (European Commission, 2020a). More than 215 000 children aged 0-3 (49% of the total) attend private kindergartens[368], which are the majority provider in some regions (Save the Children, 2019a).

Basic skills levels have not improved. The 2018 OECD Programme for International Student Assessment (PISA) shows that mean performance fell by 10 points in science and by 5 points in mathematics compared to the 2015 survey[369] (OECD, 2019b). Over a longer period (2009-2018), no significant change is evident in any subject (OECD, 2019b). The rate of underachievers was above the EU average in mathematics (24.7%) and close to the EU average (21.3%) in science - both far from the 15% ET2020 benchmark. This rate remained stable over 2009-2018 for mathematics, but significantly worsened in science (European Commission, 2019b). As in previous PISA surveys, there were comparatively few top performers in Spain. Regional differences decreased in basic skills, though mainly reflecting a deterioration in the best performing regions, but remain significant, i.e. equivalent to at least one year of schooling (Ministry of Education and

362 Gross capital formation comprises buildings, vehicles, and machinery; inventories and other valuables stored items. https://ec.europa.eu/eurostat/documents/3859598/5917333/KS-RA-11-013-EN.PDF

363 *Escuelas concertadas* are private primary and secondary schools that provide free school places under the same conditions as public schools. Their administration is private but their financing is mostly public, alongside parental contributions. Around 26% of students attend such schools.

364 Education at a Glance 2019: OECD indicators

365 Eurostat, COFOG: [gov_10a_exp].

366 Eurostat, UOE: [educ_uoe_enra10].

367 Eurostat, EUSILC: [ilc_caindformal].

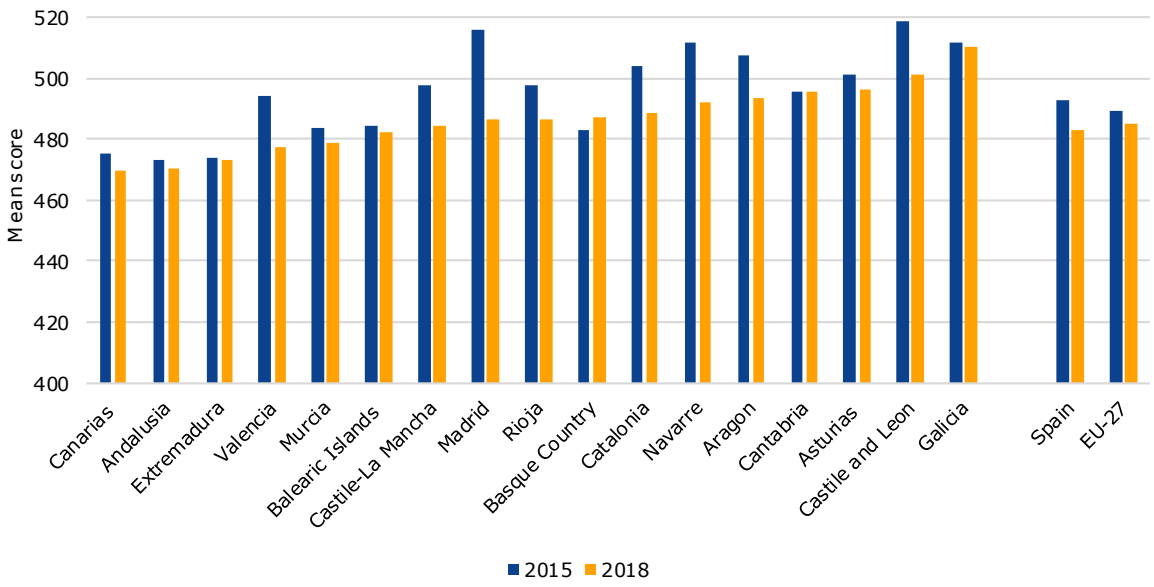
368 https://www.educacionyfp.gob.es/servicios-al-ciudadano/estadisticas/no-universitaria/alumnado/matriculado/2019-2020-da.html

369 Results in reading are not available for Spain. See OECD note at https://bit.ly/2tdJhlj

Vocational Training (MEFP), 2019a). The survey also reveals an above-average rate of grade repetition (29% in Spain; EU average 13%) (MEFP, 2019a).

Students' background has a strong influence on educational outcomes. Socio-economic background had a clear impact on the PISA 2018 mathematics and science results, equivalent to the EU average (OECD, 2019d). Save the Children (2019b) estimates that the likelihood of grade repetition is four times greater among students of low socio-economic status. School segregation by socio-economic status in Spain decreased compared to PISA 2015, but remains high in certain regions (Save the Children, 2019b). The gap between pupils with native and migrant backgrounds narrowed, but mainly reflecting the worse performance of the native students (OECD, 2019c). Differences in the expectation to complete tertiary studies between advantaged and disadvantaged pupils are similar to the EU average (European Commission, 2019b).

Figure 3 – Mean score in science in Spain and its regions, PISA 2015 and 2018



Source: DG EAC elaboration on data from PISA 2018 (2019b), together with national data of PISA results at regional level

The gender gap in science, technology, engineering and mathematics (STEM) careers aspiration remains high. About one-third of high-performing male students in mathematics or science expects to work as an engineer or science professional, while only about one-fifth of female students expects to do so. About 10% of boys but only 1% of girls in Spain expect to work in ICT-related professions (OECD, 2019c).

There are indications of some school disciplinary problems, but student well-being is relatively good. Students in Spain are less frequently bullied than in other EU countries, are more satisfied with their lives, and their sense of belonging at school is the strongest across all PISA-participating countries (OECD, 2019e). Yet, the disciplinary climate[370] was worse than average, and the share of students who had skipped school or lessons in the 2 weeks prior to the PISA test was above the EU average (OECD, 2019e).

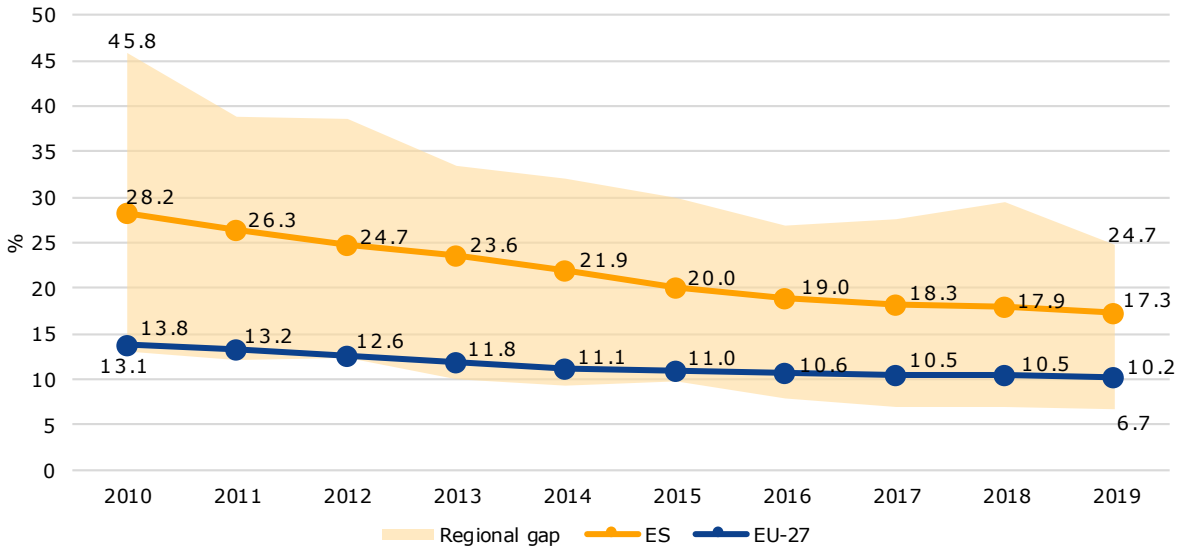
Spain still has the highest rate of early leavers from education and training (ELET) in the EU. The ELET rate fell to 17.3% in 2019, still well above the EU average (10.2%)[371]. Despite having fallen steadily over the past decade, in the last 2 years progress has slowed (1 pps in 2017-2019). The national target of 15% by 2020 seems unattainable. At regional level, ELET rates

[370] Disciplinary climate refers to how frequently the following things happen: 'students don't listen to what the teacher says'; 'there is noise and disorder'; 'the teacher has to wait a long time for students to quiet down'; 'students cannot work well'; and 'students don't start working for a long time after the lesson begins'.

[371] Eurostat, LFS : [edat_lfse_14].

remained statistically stable in most regions, although rate disparities decreased (from 22.6 pps in 2018 to 18.0 pps). ELET rates decreased in 4 regions (Galicia, Madrid, Rioja and Valencia). Increases (up to 3 pps) occurred in socio-economically developed regions (Cantabria, Catalonia and Navarre), contrary to the usual assumption that ELET mostly affects less-developed regions. Gender difference in ELET persists – the rate is 13% for girls and 21.4% for boys. In 2019, 14.9% of young people aged 15-29did not study or work (14.4% for men and 15.4% for women); 0.4 pps lower than in 2018, and 7.6 pps lower than in 2013. Although slightly lower, grade repetition remains high in most regions (over 25% of 15 year-old students). Again, well-developed regions such as Madrid and Navarre saw increased repetition rates in 2019, of 1% each[372].

Figure 4 – Early leavers from education and training 2010 and 2019



Source: Eurostat, LFS, edat_lfse_16 and National statistics from EDUCAbase

A proposal to amend the education law is being discussed in Parliament. The government put forward a proposal for a comprehensive modification of the education law in March[373]. This aims to improve access to and quality of ECEC; reinforce support for students lagging behind (by additional support measures, lower requirements for class progression and to obtain academic degrees, and new gateways between regular education and VET); lower school segregation in publicly funded schools; give schools further flexibility on curricula content, and put greater focus on competence-based learning. The success of these changes will depend, among other things, on the implementation of other linked reforms (teaching profession, VET, higher education). Measures such as limiting grade repetition need to ensure consistency with overarching goals (e.g. improving pupils' educational outcomes) (European Commission, 2020a). The proposals are contested in and outside Parliament (political parties, teachers' unions, associations of schools, parents and students, and other stakeholders), for example, on the grounds that funding is inadequate and that increased flexibility in the curriculum may risk generating even greater regional differences. The European Council has stressed that 'the success of measures that may be adopted depends strongly on taking the necessary time to build a broad and long-lasting social and political consensus around the said reform'(European Council, 2020).

Compulsory education moved quickly to distance learning in response to the pandemic crisis. As result of the COVID-19 outbreak, all education premises were closed on 14 March and in-person education replaced by distance learning. All regions had existing digital learning platforms for teachers and students. The Ministry of Education created a repository of digital learning and

372 https://www.educacionyfp.gob.es/dam/jcr:59f6b4f0-b2a9-4781-b298-96fb27eea0c8/notaresu.pdf

373 See changes in the former education law at http://www.educacionyfp.gob.es/dam/jcr:d458fa45-e9c0-4854-8787-f468015b968e/web-loe-completa-con-lomloe.pdf

teaching materials *'Aprendo en casa'* (I learn from home) for primary, secondary and VET[374] that brought together free resources for teachers, parents and pupils from existing platforms[375]. As well as materials produced by the Spanish regions and private entities, the Ministry and the National Television broadcast 5 hours of weekly programming for schoolchildren aged6-16, *'Aprendemos en casa'* (We learn at home)[376]. For tertiary studies, the Spanish Universities Association (CRUE) and the Ministry of Higher Education launched a platform called #LaUniversidadEnCasa[377]. Even though teachers were not fully prepared, their reaction was overwhelmingly positive.

The pandemic affected students' evaluations and entry exams for university studies. Regional authorities decided to reopen schools from 25 May for students finishing secondary studies, on a voluntary basis. Some regions also allowed return to school for children up to 6, students with special educational needs and those in reinforcement programs. The Sectoral Education Conference decided to cancel all diagnostic tests in primary and compulsory secondary levels and that all primary, compulsory secondary and first-year non-compulsory secondary students should advance to the next grade, with grade repetition to be used only exceptionally. The Conference also decided to delay the end-of-secondary-studies exam giving access to university studies, and to modify the modalities and content of the exam.

The COVID-19 pandemic posed significant challenges for socio-economically disadvantaged students. Education authorities estimate that around 10% of the 8.2 million students did not have digital devices or internet access at home. The teachers' union ANPE pointed out that parents from a low socio-economic background are less able to support their children. The non-governmental organisation (NGO) Save the Children reported that among families with monthly incomes of less than EUR 900, 42% do not have a computer at home and 22% do not have internet access. The Ministry of Education sent 23 000 SIM cards of 40 GBs per month to students of upper secondary and VET with fewer economic resources. City Councils and NGOs also took initiatives to alleviate the digital divide. Some companies contributed by providing free tablets, smartphones and broadband access. The cost of providing disadvantaged students with computers and a reliable internet connection was calculated at EUR 45 million[378]. The Commission's proposal for the European Council 2020 country-specific recommendation to Spain includes 'Improve access to digital learning' (European Council, 2020).

6. Modernising vocational education and training

Low enrolment in VET persists and the employment rate of VET graduates decreased. In 2018, the share of upper secondary Spanish students in VET (35.8%) remained below the EU average (48.4%). The employment rate of recent upper secondary VET graduates dropped from 70.0% in 2018 to 66.0% in 2019, well below the EU average of 79.1%.

VET graduate tracking has been launched. The creation of an integrated information and monitoring system, coordinated by the State Public Employment Service (SEPE), is ongoing to increase transparency and coordination of the VET system for employment. This will include a state registry of all VET providers and a catalogue of all formal and non-formal training programmes and the respective delivery requirements (Cedefop ReferNet Spain, 2019). In July 2020, the Ministry of Education and Vocational Training released two reports: one about VET graduate transition into the labour market (MEFP, 2020b), and another about the education paths followed by VET students after graduation (MEFP, 2020c).

New initiatives aim to strengthen digital skills training. The Spanish Digital Agenda set a roadmap to achieve the EU Digital Agenda goals (Cedefop forthcoming). Multiple initiatives were launched by different public bodies, in some cases in partnership with business, to train young people and the (un)employed. Following an agreement with 12 large technology companies, since

374 https://aprendoencasa.educacion.es/

375 Such as Procomun (open network with more than 94 000 resources), EDIA Project and CIDEAD.

376 https://aprendoencasa.educacion.es/aprendemos-en-casa/

377 https://www.uned.es/universidad/inicio/uned_uoc_solidaria.html

378 https://nadaesgratis.es/admin/brecha-digital-infantil-y-el-covid-19

December 2019 the State Foundation for Training in Employment (Fundae) and SEPE have been offering training resources in digital skills for free, tailored to the unemployed and SME workers (Cedefop ReferNet Spain, 2020a). Red.es, a body of the ministry in charge of the Digital Agenda, is running a number of actions on digital skills, such as 'digital professionals youth employment' for those registered in the Youth Guarantee Scheme (Cedefop ReferNet, 2020). INTEF is developing interactive and multimedia education resources in collaboration with the regions, to support social networking and the integration of ICT into non-university education (Cedefop and Fundae, 2019; Cedefop ReferNet, 2017).

Measures to continue VET online were developed in response to the COVID-19 crisis. The Ministry of Education and Vocational Training partnered with various IT and telecom companies to help upper secondary and VET students with difficulties in accessing resources. National authorities tried to ensure that practical training in companies (in either school-based VET or dual VET) was maintained (Cedefop ReferNet Spain, 2020b).

New legal framework for VET. From January 2020, the whole VET regulation is under the responsibility of the Ministry of Education and Vocational Training, including both initial and continuous VET (for education and employment respectively). Nevertheless, the Ministry of Labour will keep some VET initiatives to address short and specific workplace training needs.

Box 2: Improving digital skills of unemployed young people

The programme, run by the EOI Foundation in collaboration with Google, provides young unemployed people with the knowledge, skills and behaviours needed in a highly digitised job market. It does so through 40 hours of MOOCs followed by 20 hours of tutoring. Accessible on the Google Actívate platform, the MOOCs cover topics such as digital consulting, big data, artificial intelligence/machine learning, robotics and cybersecurity. Once their MOOC is completed, participants can choose an expert who will tutor them for their final project. The programme is active in 36 Spanish provinces, including in rural areas where digitalisation represents a great plus for economic development. With a total budget of EUR 1 392 000 (92% from the European Social Fund) for 2017-2019, nearly 5 500 people followed the MOOCs and 411 participated in the entire programme, of whom 87.5% of women and 77% of men found a job shortly after participating.

7. Modernising higher education

Skills mismatches are significant. Higher education attainment (44.7%) is one of the highest among EU countries (above the average of 40.3%)[379], but graduates are concentrated in fields which are not the most in demand in the labour market. Business, administration and law (19%), education (17%), and health and welfare (17%) are the most popular fields of study[380]; while ICT (3.9%), mathematics and statistics (0.5%) and manufacturing and processing (0.8%), where there are skills shortages, are less popular (Cedefop, 2016; Adecco, 2018). University graduates have a hard time finding jobs that meet their qualifications and are forced to accept middle- or low-skilled jobs. In 2019, the employment rate of recent tertiary graduates in Spain (77.2%) was below the EU-27 average (85.0%)[381]. Of those who graduated at university in 2014, 27.2% were not in work in 2018 (MEFP, 2019b). On the same year, 30.6% of tertiary graduates had a job that did not require a tertiary diploma, above the EU-27 average (28.1%)[382].

Student guidance and orientation on career opportunities is needed to reduce mismatches. Closer cooperation between universities and business could help reduce skills shortages by better aligning education programmes and providing on-the-job traineeships. Educational guidance prior to university does not sufficiently focus on pathways to the labour

379 Eurostat, LFS: [edat_lfse_03].

380 Eurostat, UOE: [educ_uoe_enrt03].

381 Eurostat, LFS: [edat_lfse_24].

382 Eurostat,LFS: https://ec.europa.eu/eurostat/documents/7894008/9596077/Horizontal_Skills_Mismatch_Rate_by_FoE.xlsx.

market. A survey indicates that low enrolment in STEM degrees (25% of total) may be largely due to a lack of guidance (65% of upper secondary respondents) and the perception that these degrees are very challenging (40%) (DigitalES, 2019).

Gender bias influences the choice of tertiary studies. In 2018, 56.4% of tertiary graduates were women and women account for a particularly large majority of current students in fields like education (77.5%), health and welfare (71.7%) and social sciences, journalism and communication (61.8%) The opposite is true in fields like ICT, engineering, manufacturing and construction, and mathematics and statistics (87.5%, 74.7% and 62.6% male, respectively)[383]. While in the past 5 years enrolment of women in tertiary studies increased, in both number and proportion (from 51.4% 2013 to 54% in 2018), the share enrolled in ICT (14.6 % v 12.5%) and in engineering (26.4% v 25.3%) actually decreased. Digital.es (2018) recommended increasing the number of women studying technological subjects by: 1) identifying and making visible models and references in the sector, 2) making changes in the education model, 3) fostering more inclusive business traineeships and 4) generating a working model that fosters co-responsibility for people care.

Spain is developing a tertiary graduate tracking mechanism. At national level, the existing method for tracking graduates is based on the administrative data sets from public employment services (PES), the National Institute of Statistics (INE) and higher education statistics. A system to track skills is under development in Spain, in cooperation with the business sector. PES is producing a methodology to detect training needs in cooperation with regions, social partners and national reference centres (European Commission, 2020a). At regional level, 3 out of 17 regions implement systematic graduate tracking measures and in another 2 conduct less systematic ones. For the remaining territories, there is no evidence on the existence of such measures. At University level, most universities have regular measures to track their graduates, bur these measures differ in content and methodologies and thus, results are not comparable across universities.

8. Promoting adult learning

Profound imbalances in access to digital education and training remain. Adult participation in learning activities slightly improved from 10.5% in 2018 to 10.6% in 2019 (EU average 10.8%). In 2019, 43% of people aged 16-74 lacked basic digital skills (EU average 42%) (European Commission, 2020b). The main challenges for digital education are to provide adults with devices and quality internet access and to improve teacher training for the digital education of adults.

Numerous measures have been taken to support the continuation of education online during the COVID-19 crisis. The Centre for Innovation and Development of Distance Education (CIDEAD) was active in providing distance adult education. '*Aula Mentor*' provides a non-formal, flexible online training programme for adult learners to develop personal and professional competences via a catalogue of courses which includes web design, environmental issues, culture, health, etc.

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[383] Ibid.

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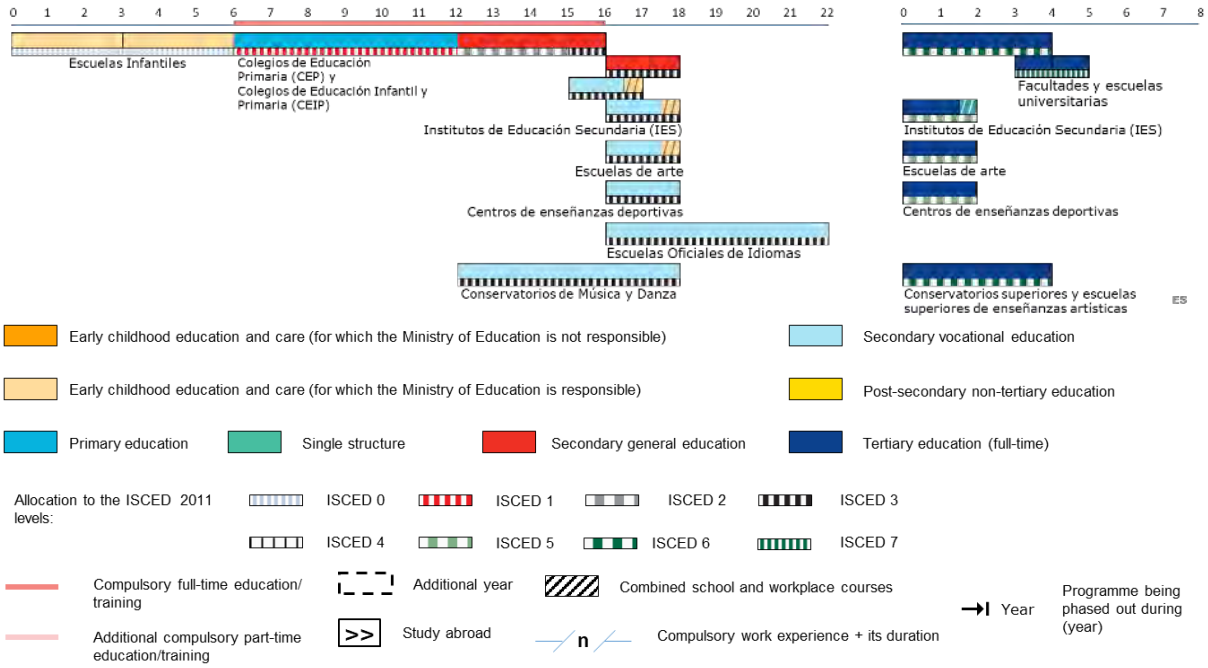
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Antonio GARCIA GOMEZ
Antonio.GARCIA-GOMEZ@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

European Commission

SWEDEN

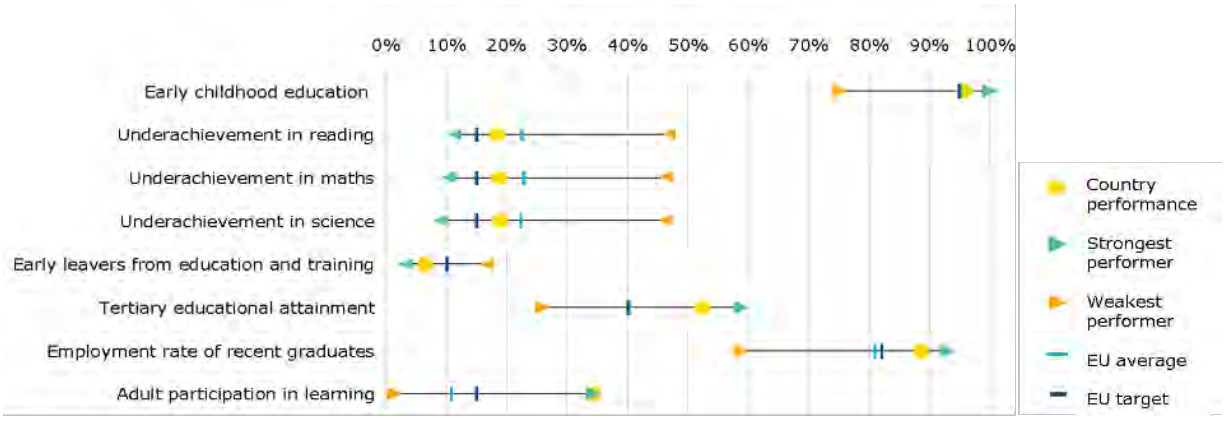
1. Key indicators

Figure 27 – Key indicators overview

			Sweden		EU-27	
			2009	2019	2009	2019
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)			7.0%	6.5%	14.0%	10.2%
Tertiary educational attainment (age 30-34)			43.9%	52.5%	31.1%	40.3%
Early childhood education (from age 4 to starting age of compulsory primary education)			94.7%	95.9% [18]	90.3%	94.8% [18]
Proportion of 15 year-olds underachieving in:	Reading		17.4%	18.4% [18]	19.3%	22.5% [18]
	Maths		21.1%	18.8% [18]	22.2%	22.9% [18]
	Science		19.1%	19.0% [18]	17.8%	22.3% [18]
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-8 (total)		81.6%	88.7%	78.0%	80.9%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		22.5%	34.3%	7.9%	10.8% [b]
Learning mobility	Degree mobile graduates (ISCED 5-8)		:	4.5% [18]	:	4.3% [18]
	Credit mobile graduates (ISCED 5-8)		:	10.5% [18]	:	9.1% [18]
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		6.7%	6.9% [18]	5.1%	4.6% [18]
	Expenditure on public and private institutions per student in € PPS	ISCED 1-2	€8 101 [12]	€8 639 [17]	€6 072 [d, 12]	€6 240 [d, 16]
		ISCED 3-4	€8 430 [12]	€8 477 [17]	: [12]	€7 757 [d, 16]
		ISCED 5-8	€17 358 [12]	€17 745 [17]	€9 679 [d, 12]	€9 977 [d, 16]
Early leavers from education and training (age 18-24)	Native-born		6.4%	4.6%	12.6%	8.9%
	Foreign-born		11.9%	13.6%	29.3%	22.2%
Tertiary educational attainment (age 30-34)	Native-born		44.3%	52.5%	32.0%	41.3%
	Foreign-born		42.6%	52.7%	25.1%	35.3%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	ISCED 3-4		74.6%	84.9%	72.2%	75.9%
	ISCED 5-8		89.6%	91.7%	83.7%	85.0%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by DG EAC, based on UOE 2018 data. Further information can be found in Annex I and in Volume 1 (ec.europa.eu/education/monitor). Notes: The 2018 EU average on PISA reading performance does not include ES; b = break in time series; d = definition differs, : = not available, 12 = 2012, 16 = 2016, 17 = 2017, 18 =2018.

Figure 2 - Position in relation to strongest and weakest performers



Source: DG EAC, based on data from Eurostat (LFS 2019, UOE 2018) and OECD (PISA 2018).

2. Highlights

- Schools are highly digitally equipped and pupils' digital skills are good, but teachers need more training.
- Investment in education is high and many reforms are planned.
- The gap in reading between learners with a migrant background and native students is growing.
- There is a shortage of subject-teacher students, and teacher training needs to be strengthened.

3. A focus on digital education

The population has high digital skills, but there are not enough information and communications technology (ICT) graduates. Digital skills of 16-19 year-olds are better than the EU average: 71% have above basic digital skills (EU-27 57%)[384] and those of general population are among the best in the EU. There is a shortage of ICT graduates on the labour market (European Commission, 2020), which is likely to continue: shares of ICT graduates and students are relatively low (3.7%[385] and 4.3%[386], respectively) and pupils who perform well in the OECD Programme for International Student Assessment (PISA) also show low interest in ICT professions (OECD, 2019-SE).

A National digitalisation strategy for the school system was adopted in 2017 (Regeringen, 2017). It is monitored regularly by the National Agency for Education (NAE, 2019a), and implemented through a National action plan developed by the Swedish Association of Local Authorities and Regions (SALAR, 2019). It includes coding skills in compulsory school and revised curricula and syllabi for upper secondary education. Diploma goals for VET programmes have been updated according to digital competence needs in different vocations.

Teachers' digital skills need to be better supported. There is no compulsory coverage of ICT in initial teacher education (ITE) or assessment of digital competencies before entry into the profession (European Commission, 2019b). The share of teachers trained in ICT in ITE is the lowest in the EU (36%; EU-22 49.1%) and the share who report a high level of need for ICT training (22.2%) is above the EU-22 average (18%) (OECD, 2019b). As digital skills became part of the national curriculum in all schools from 1 July 2018, teachers now probably feel an increased need to acquire ICT skills. A recent Swedish survey about the effect of COVID-19 on education showed big variations between schools in the accessibility of digital learning resources and their use by teachers (a third did not have access and use them, while almost 50% had good access and used them a lot) (Bergdahl & Nouri, 2020). This reflects decentralisation of the school system and the resulting autonomy in funding and teaching. Access to technical and educational support also varies between schools, rising with the level of education (NAE, 2019a). A large number of teachers encounter technical problems during lessons, preventing them from completing them as planned[387]. The share of teachers participating in ICT continuing professional development (CPD) annually (66.6%) grew by 19.8 pps in 2013-2018 (OECD, 2019b).

Schools are highly digitally equipped and connected, and pupils' use of ICT for learning is high. Compared to the European average, pupils at all levels attend schools more highly digitally equipped and connected (see Figure 3), with a favourable ratio of digital equipment per student and high-speed internet. A high share of pupils attend schools where more than 90% of equipment is operational and have access to a virtual learning environment at school and from outside – for lower secondary school 93% (EU average 54%) and 99% (EU average 89%), respectively. Pupils' use of internet at school for learning is the second highest in the EU in both lower and upper

384 Eurostat: [isoc_sk_dskl_i].

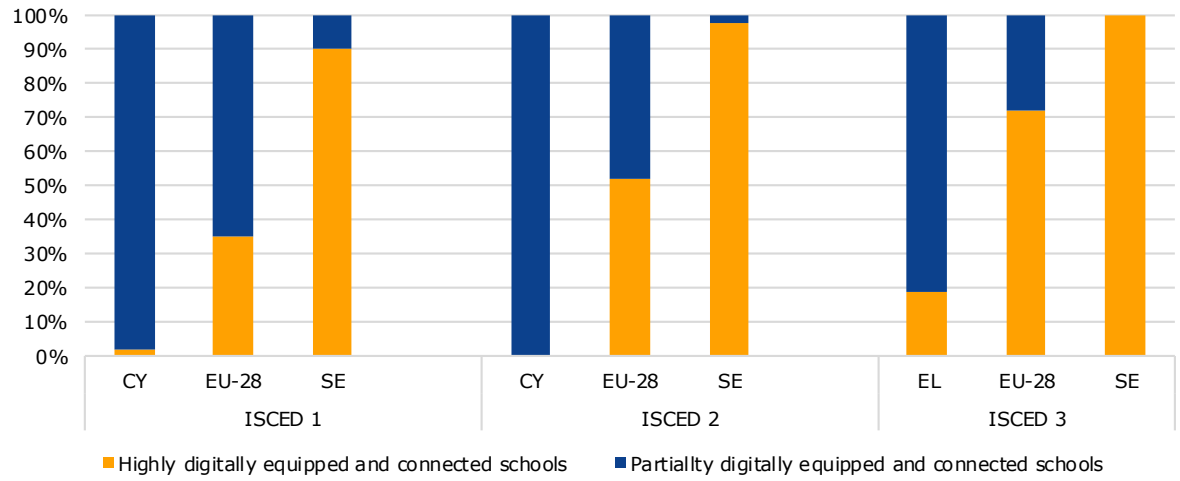
385 DESI, 2019

386 Eurostat, UOE: [educ_uoe_grad03].

387 https://lararnastidning.se/teknikstrul-stor-halften-av-alla-lektioner-sa-drabbas-larare/

secondary school (European Commission, 2019), as is the percentage of teachers who let students use ICT for projects and class work (63.3%; EU-22 46.9%) (OECD, 2019b).

Figure 3 – Share of pupils in digitally equipped and connected schools by education level, 2018



Source: 2nd Survey of Schools: ICT in education, Country Reports, 2019

There are concerns about negative effects of digitalisation on education. Two studies on introducing one computer per pupil have shown its adverse effect on equity in schools, due to more work and to pupils learning alone (Grönlund, Andersson et al. 2014; Hall, Lundin et al. 2019). With digitalisation, the use of printed materials decreases, risking a negative impact on reading comprehension (Delgado et al., 2018). A growing number of students now think that reading is a waste of time (40% in 2018, 10-11 pps higher than in 2009) (NAE, 2019c). To counter these negative effects, a mobile phone ban is being introduced in schools[388].

4. Investing in education and training

Investment in education is high and most spending other than for tertiary level comes from local government. In 2018, the share of GDP spent on education was again the highest of all EU countries (6.9%; EU-27 4.6%). Education's share of total general government expenditure was also among the highest (13.8%; EU-27 9.9%)[389]. Sweden is the EU country with the largest share of education expenditure at local government level (5.5%; EU-27 1.6%)[390], and the only OECD EU country where primary and secondary education are 100% financed from public sources (OECD, 2019c).

New targeted spending aims to improve school education. The NAE received funding to develop new school syllabi and prepare for the introduction of new subject grades in upper secondary school. The Swedish Schools Inspectorate is receiving additional funding to increase supervision based on individual cases and evaluation of the reading, writing, and counting guarantee (Regeringen, 2019d). The equality grant to municipalities, to boost the quality of schools with more children with a migrant background, continues, amounting to EUR 460 million in 2020, and can now also be used for after-school centres[391]. Municipalities were seeking to reduce their education funding before the pandemic; government will give them EUR 2 billion extra to combat its effects, but how much will go to education is not known[392].

388 https://www.regeringen.se/debattartiklar/2019/02/mer-trygghet-och-studiero/
389 Eurostat, COFOG: [gov_10a_exp].
390 Idem.
391 https://skolvarlden.se/artiklar/varbudgeten-flytta-pengar-fran-skolan
392 https://www.regeringen.se/pressmeddelanden/2020/04/ytterligare-tillskott-till-kommuner-och-regioner/

5. Modernising early childhood and school education

Participation in early childhood education and care (ECEC) is above the EU benchmark. Formal childcare attendance by children under 3 is high (49.4%; EU-27 34.7% in 2018)[393]. Participation in ECE from age 4 to the beginning of compulsory primary education was 95.9% in 2018, above the EU average (94.8%) and benchmark for 2020 (95%)[394]. Participation of children with a migrant background is lower; an inquiry is seeking ways to improve it, with a report expected in October 2020 (Regeringen 2019h, and Regeringen 2019i). The last year before primary school - pre-school class - will formally become the first year of primary school. An inquiry is analysing how to do this, with results expected in April 2021 (Regeringen, 2020). There is concern that this may aggravate the teacher shortage. From 1 July 2020, pre-school directors have the title of principal and face the same qualification requirements as school heads (to be acquired in a 3-year part-time course), to increase the quality of instruction[395].

Early school leaving has decreased below the national benchmark, but is highest among boys and those from a migrant background. The early leavers from education and training rate in 2019 is 6.5%, below the EU-27 average of 10.2%[396] and, having decreased by 1 p.p. from 2018, is again below the Europe 2020 national target of 7%. It is higher for boys (by 1.9 pps)[397] and significantly higher for foreign born (13.6%) than for native born (4.6%)[398]. It is also higher in rural areas (8.4%) than in cities (4.6%), a difference that has grown by 3.4 pps since 2009[399].

Pupils' basic skills levels are again improving. Results of the OECD's PISA 2018 show that after a period of deterioration in mathematics and science, pupils' performance has improved and is now better than the EU average in all three domains. Mean scores in all three fields are above the EU average, the share of top performers in mathematics and reading has also improved, and they are among the best for reading (13.3%, EU-27 8.5%) (OECD, 2019, Vol. I). Percentages of underachievers are below the EU averages: mathematics 18.8% (EU 22.9%), science 19.0% (EU 22.3%) and reading 18.4% (EU 22.5%), but remain well above the 15% EU target. The improvement suggests that educational reforms of recent years are bearing fruit.

The gap in reading ability between learners with a migrant background and native pupils is growing. It is among the highest in the EU, both in the mean scores (83 points v EU-27 44.9, higher than in previous years) and in the percentage of underachievers (25.5 pps gap, and especially high for pupils born abroad, at 38.2 pps) (OECD, 2019, Vol. II). The number of pupils with a migrant background nearly doubled in 2009-2018 (European Commission, 2020).

393 Eurostat, EU-SILC: [ilc_caindformal].

394 Eurostat, UOE: [educ_uoe_enra10].

395 https://chefochledarskap.se/sverige-far-4%E2%80%89770-nya-rektorer/

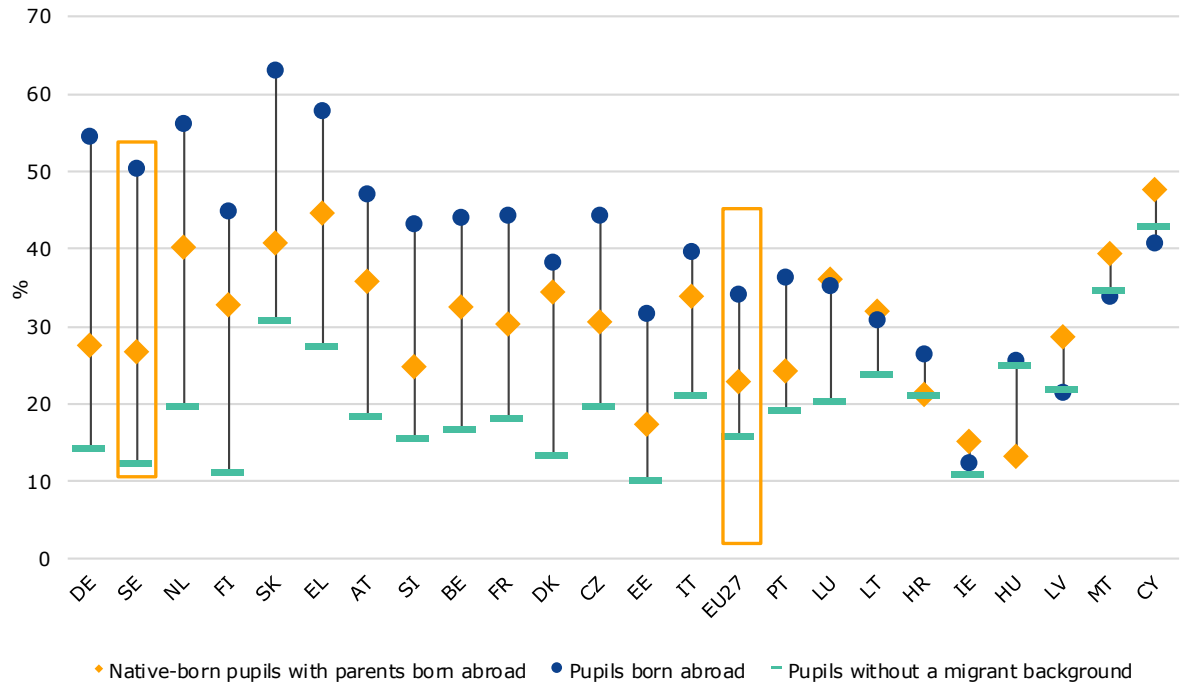
396 Eurostat, LFS: [edat_lfse_14].

397 Idem.

398 Eurostat, LFS: [edat_lfse_02].

399 Eurostat, LFS: [edat_lfse_30].

Figure 4 - Percentage of underachievers in reading, by migrant background, PISA 2018



Source: OECD 2019, PISA 2018. Note: Data for BG, PL and RO are missing. SK, LT, HU, CZ, LV have less than 5% of migrant students. The EU average does not include ES.

Inequalities affect performance. Socio-economic background affects educational outcomes, at individual and school levels, but less than the EU average. School principals reported more staff shortages but less material shortages than the OECD average, and this is more pronounced in disadvantaged schools (40% v 20%) (OECD, 2019-SE, p. 5). There is a widening gap between schools with the highest and those with the lowest results in 115 out of 188 municipalities, and the number of schools where many pupils are not eligible for upper secondary education has nearly doubled in 5 years[400]. Gender gaps in mean scores in favour of girls in reading and science are above the EU-27 average (34 pps v 28 pps and 8 pps v 0.7 p.p., respectively), as are the gaps in the percentage of underachievers. A court in Gothenburg has confirmed that Statistics Sweden should not provide municipalities and the public with school level information on private schools' composition, pupils' background and results due to obligation to preserve statistical confidentiality of individual legal or physical persons' information. This presents problems for education analysis and determination of funding needs[401] and work is ongoing to remedy these problems. There are suggestions to abolish queue time as a selection criteria in private schools to reduce school segregation, and to introduce a coordinated school choice period for private and public schools and equivalent information for all (Andersson et al., 2019). School authorities are working on national targets and indicators for monitoring schools' activities to improve equity and better understand schools' success factors (Regeringen, 2020f). Grading in Sweden is in practice partly dependent on the school and class average: analysis shows that independent schools give higher grades in relation to national tests than this effect alone would account for[402].

Several educational reforms are being considered. On the proposal of the NAE, the government has decided on the changes in the subject syllabi, to make them clearer and simpler and to emphasise teaching of factual knowledge in early years, adapting content to grades. Several inquiries are ongoing or being processed to address inequality and educational quality. They will analyse grade inflation (Regeringen, 2019e) (analysis and proposals of changes in grading delivered in August, now in consultation), the learning environment in after-school centres

400 https://www.dagenssamhalle.se/nyhet/storre-skillnader-mellan-basta-och-samsta-skola-29460
401 https://www.lararen.se/nyheter/senaste-nytt/ny-dom-gor-friskolors-betyg-hemliga
402 https://www.skolverket.se/getFile?file=6564

(Regeringen, 2019b), the possibility of closing schools with major and recurring shortcomings (Regeringen 2019k), and the possibility of transferring school funding back to the state, and propose measures to reduce school segregation and improve the allocation of resources to preschool and compulsory school (Regeringen, 2018). In 2020, Sweden received a country-specific recommendation to 'foster innovation and support education and skills development' (Council of the European Union, 2020).

Wellbeing affects reading performance. One third of all pupils feel that they do not belong at school, and this has a very negative effect on their reading performance (-23 points v EU average of -16). While pupils in Sweden are not likely to skip school, disadvantaged pupils are twice as likely to do so as advantaged ones (13.1% v 6.9%), as are pupils with a migrant background (15.8% v 8.3% for native born, nearly twice the EU difference of 4.9 pps) (OECD, 2019, Vol. III).

Teacher shortages and frequent changes of school principal affect the quality of education. The projected teachers' shortage for 2033 stands at 45 000, lower than previously estimated as projected inflows of pupils with a migrant background have fallen, but corresponding to 21% of the current teacher population (NAE, 2019b). The 'Boost for Teachers' Salaries' scheme has increased the salaries of one in three teachers, but has also created inequalities and divisions, and has not yet caused numbers entering the profession to rise. The budget for 2020 funds continuation of the scheme and another boost additionally benefiting teachers in schools with particularly difficult conditions (Regeringen, 2019f). The 2020 budget also supports targeted programmes for special needs (EUR 3 607 500 in 2020), vocational teachers (EUR 2 775 000 annually until 2023), and additional training of school leaders (EUR 1 850 000 increase) (Regeringen, 2019d). To enable wider participation in the Boost for teachers, the requirement that teachers already teach the subject for which they want to become qualified is removed (Regeringen, 2020c). There is an initiative for unqualified experienced personnel to complete teacher training: Vidareutbildning av lärare och förskollärare (VAL) (Regeringen 2019g). A teachers' union survey shows that 49% of unqualified teachers have started, but not completed, teacher training[403]. An inquiry is looking into how to increase the quality of teacher training and make it easier for people to become teachers[404]. Teacher shortages are worst in rural areas of northern Sweden[405] where in some schools no teacher is certified for the subject they teach. From 30 June 2021 a law will enable the use of distance education as a response: pupils would be in the classroom, but taught by a qualified teacher from another school (Regeringen, 2020b[406]). The Swedish Schools Inspectorate reported a high turnover of principals (50% work in their school for less than 3 years), particularly in schools with bad results. The share of teachers who doubt that they chose the right profession is among the highest in the EU (41.3%; EU-22 25.9%), and significantly higher among men (7.8 pps gap v EU-22 3.5 pps) (OECD, 2019b, Vol. II). CPD for teachers usually takes place in the school, and is less adapted to teachers' personal development needs (61.4%; EU-22 77.9%). CPD is more likely to take the form of peer learning (46.8%; EU-22 32.5%) or networking (46.6% v 30.6%). Participation in the formal qualification programme is far lower than the EU average (5.1%; EU-22 14.7%) (OECD, 2019b, Vol. I), which is especially worrisome due to the large number of unqualified teachers in schools.

Challenges encountered in delivering distance teaching during the COVID-19 pandemic. Only upper secondary schools, higher education and adult education transitioned to distance education on 18 March, while remaining accessible for small groups, for example for practical examinations and special learning support. Most schools had sufficient infrastructure and resources. The NAE on its website https://www.skolverket.se provided guidance on how to organise work and prepared online resources for distance teaching and information for teachers at www.skolahemma.se. Reflecting the decentralisation of the system, all decisions on technical platforms, educational materials, etc. are taken at local, and often even school level. Some teachers reported that newly arrived pupils did not have computers, internet connections or the

403 https://www.lararforbundet.se/artikelsidor/rapport-fraan-obehorig-till-larare

404 https://www.regeringen.se/pressmeddelanden/2019/10/reformering-av-lararutbildningen/

405 https://lararnastidning.se/lista-laget-i-lararbristen-basta-och-varsta-kommunerna/

406 https://www.regeringen.se/rattsliga-dokument/lagradsremiss/2020/02/fjarrundervisning-distansundervisning-och-vissa-fragor-om-entreprenad/

necessary IT skills, and could not get help from their parents (Bergdahl & Nouri, 2020). Many pupils say their internet is not good enough for distance studies. They are concerned about the workload, tests and excessive screen time, and do not feel motivated to learn (Sveriges Elevkårer, 2020). Common challenges included difficulties when teaching practical subjects, teachers unused to digital teaching, overload of internet or platforms and the need to translate materials for students speaking other languages. Pupils who were previously often absent from class or had problems with learning are sometimes more present and perform better than before, due to a more individualised approach and lack of distractions. More reflection-based tests were used, to avoid cheating through use of the internet during tests (Hall, 2020). However, some teachers report that though digitally present, pupils participate less (Lärarnas Riksförbund, 2020c). Schools and universities reopened on 15 June, after the end of the school year, but in time to enable summer classes[407]. Due to the pandemic, new temporary regulation enables upper secondary schools to combine on-site and distance learning, which is already possible in adult and higher education. Education agencies monitor developments.

Box 1: The Swedish approach to the pandemic

While kindergartens and schools in other Member States closed due to the pandemic, they remained open in Sweden. The Public Health Agency's opinion was that closing down kindergartens and compulsory schools would not significantly reduce the spread of the disease, as they are local, but would negatively affect the economy as parents would need to stay home to take care of children[408]. Some municipalities, facing shortages of kindergarten staff, excluded children of unemployed people and those on maternity leave from kindergarten (NAE, 2020), even though this goes against educational goals. Pupils in compulsory schools were obliged to be in school unless ill, and schools were told that since they were open, they had no obligation to teach children who are at home[409]. Many offered them distance tutoring, however. Even teachers who were deemed to be at high risk had to teach in school[410]; 32% of teachers expressed dissatisfaction with this approach. Forty percent of teachers state that they will not be able to complete their teaching programme for the year (Lärarnas Riksförbund, 2020b). The government has allocated about EUR 11 million to vacation schooling for pupils who did not achieve educational goals during the crisis (Regeringen 2020d).

6. Modernising vocational education and training

Participation in initial vocational education and training (IVET) is low, though the employment rate is among the highest in the EU. The share of VET students among secondary students in 2018 was 35.4% (EU average 48.4%). In 2018/19 there were 12 400 apprentices, representing 12% of all national VET learners, an increase of 207% of enrolled apprentices since 2013/14 (Cedefop ReferNet Sweden, 2020). Recent VET graduates' employment rate was 87.4% in 2019, exceeding the EU-27 average (79.1%).

In 2019 Sweden decided on the revision of content in certain IVET programmes, starting from 2021. Aspiring assistant nurses in the health and social care programme, and students of the natural resource use programme and the vehicle and transport programme are most affected. (Cedefop ReferNet Sweden, 2020).

A national commission of inquiry (*Yrkesprogramsutredningen*) recommended that establishment of trade/industry schools to provide the work-based component of secondary VET programmes. This is relevant for trades and industries with too few applicants, and VET institutions do not have the required infrastructure to provide workplaces. Ten trade schools have been selected to pilot the measure in 2018-2023, and a state grant of up to EUR 4 700 (SEK 50 000) per learner is available to them (Cedefop ReferNet, 2020).

407 https://www.regeringen.se/pressmeddelanden/2020/05/kravet-pa-distansundervisning-lattas-upp/

408 https://www.folkhalsomyndigheten.se/smittskydd-beredskap/utbrott/aktuella-utbrott/covid-19/fragor-och-svar/?exp=69079#_69079

409 https://www.lararen.se/nyheter/coronaviruset/skolplikten-gallergrundskolan-behover-inte-undervisa-pa-distans

410 https://skolvarlden.se/bloggar/alexander-skytte/vi-larare-kan-inte-folja-myndigheternas-riktlinjer

The expansion of higher VET continues. The number of study places increased by 70% in 2014-2020, mostly during the last 2 years (38%). This expansion includes the increase provided through distance learning, which grew from 12% to 21% of all programmes in 2007-2019, half of the increase during the last 5 years (Cedefop ReferNet, 2020). The expansion of higher VET is part of the government's ongoing initiative 'the Knowledge Boost', which aims at creating an additional 100 000 permanent study places. (Regeringen, 2019c).

Box 2: Digga Halland

This project is a cooperation between several municipalities, the Halland region and academia to increase the digital competences of workers in the healthcare and care sectors. It consists of 10 parts:

- The first part is broad web-based training about new, digitalised ways of work, current digital tools in health and care, and ethical and legal aspects of their use. It is obligatory for all participants, and courses should be short, individual or group-based, and adapted to the work.
- The next eight parts are specific for certain municipalities and/or organisations, and are organised in the workplace, enabling staff to review their work methods and processes and create new and better ones from a user/patient perspective, using digital tools.
- The last part is monitoring and documenting of knowledge and results and exchange between different participating groups.

The planned number of participants is 7 000, of whom 5 217 have already participated.
Project period: 01/08/2018 – 31/01/2021.
COVID-19 effect on the project: prolonged, some activities re-arranged and, as digitisation of work in this sector has increased, the project will build upon it further.

ESF funding: EUR 1.9 million (SEK 20 996 190)

Website: https://hh.se/diggahalland

7. Modernising higher education

Tertiary attainment is above the EU average, but there is a gender gap. The tertiary attainment rate in 2019 is 52.5%, above the EU-27 average of 40.3%. The gap between women and men (59.9% and 45.5%) is above the EU-27 average (14.4 pps v 10.5 pps)[411]. The difference between native born (52.5%) and foreign born (52.7%) is small, and unusually in favour of foreign born (-0.2 p.p.). This is mostly due to very high tertiary attainment among residents from within the EU (64.7%)[412].

More subject-teacher students and higher quality of teacher studies are needed. The Report of the Swedish Higher Education Authority (UKÄ) shows the need for an 87% increase in annual enrolments for subject-teaching studies in 2023-2035 from 2018 to meet future teacher needs (UKÄ, 2019). The Authority is reviewing quality of 44 out of 103 subject-teacher training courses[413]. Applicants for teacher studies who come directly from secondary school will have to meet higher grade requirements in their chosen subject. This should reduce the number of students who do not finish studies[414].

The employment rate of recent graduates is high. The employment rate of all recent graduates (ISCED 3-8) in 2019 (88.7%) is above the EU benchmark for 2020 (82%) and the EU-27 average (80.9%). For tertiary graduates it is 91.7%, above the EU-27 average of 85%[415].

411 Eurostat, LFS: [edat_lfse_03].

412 Eurostat, LFS: [edat_lfs_9912].

413 https://www.uka.se/om-oss/aktuellt/nyheter/2020-02-19-utvarderingen-av-amneslararutbildningarna-klar.html

414 https://sverigesradio.se/artikel/7463994

415 Eurostat, LFS: [edat_lfse_24].

Universities were able to adapt their programmes and faced few challenges during the COVID-19 crisis. The study loans system was adapted so that students continued receiving payments even if their educational institution was closed[416]. The government has announced funding of EUR 6 million to stimulate distance learning in universities (Regeringen, 2020e). Even though the spring Swedish University Aptitude Test, one of the major routes to higher education, was cancelled due to the pandemic, the number of applications for higher education (HE) studies is 13% higher than last year, the highest ever[417]. Interest in medicine and nursing studies, which have had shortages, increased, nursing applications by 33%. The government has also allocated about EUR 10 million to increase the number of students in these fields by 2 600 (Regeringen 2020c).

8. Promoting adult learning

Participation in adult learning is high, and new investments are ongoing. Investments are particularly relevant for sectors such as health care, construction, education and ICT. Participation in adult learning is the highest in the EU at 34.3% (EU-27 10.8%). In addition to the 2019 'Knowledge boost' initiative (European Commission, 2019c), and as a response to the COVID-19 crisis, the government proposed in March 2020 new initiatives to invest in all levels of education, including in adult VET.

The digitalisation of formal municipal adult education (Komvux) has been much slower than in schools. The number of students per computer is estimated at 3.7 in Komvux compared to 1.3 in compulsory school and 1.0 in upper secondary education (NAE, 2018). The percentage of students who have received or borrowed a personal computer or tablet from the school is also much lower, 6% in Komvux compared to 49% in compulsory school and 88% in upper secondary education.

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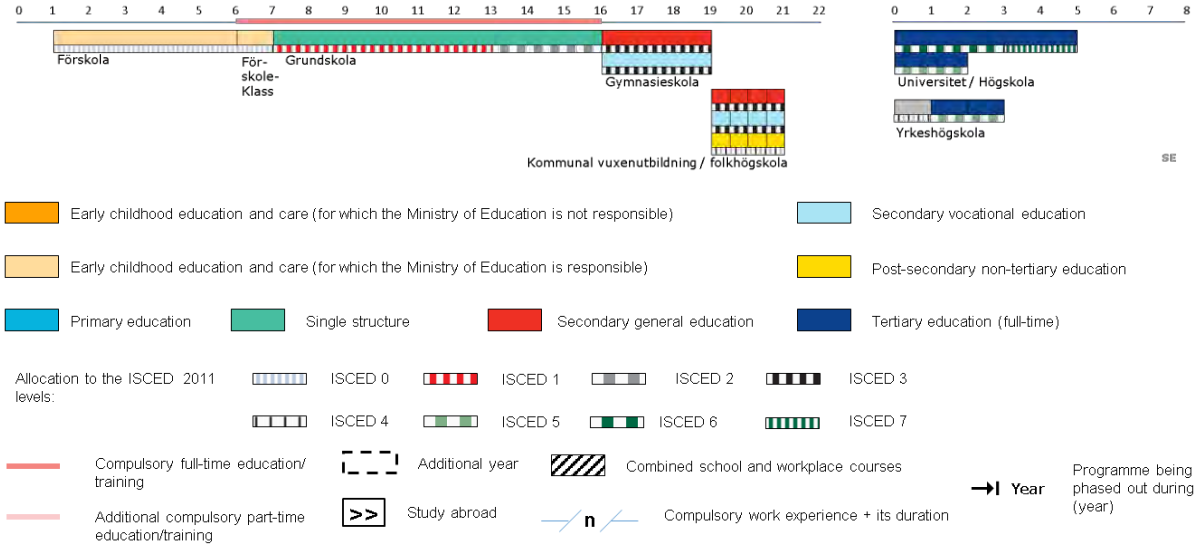
Annex I: Key indicators sources

Indicator	Eurostat online data code
Early leavers from education and training	edat_lfse_14 + edat_lfse_02
Tertiary educational attainment	edat_lfse_03 + edat_lfs_9912
Early childhood education	educ_uoe_enra10
Underachievement in reading, maths and science	*OECD (PISA)*
Employment rate of recent graduates	edat_lfse_24
Adult participation in learning	trng_lfse_03
Public expenditure on education as a percentage of GDP	gov_10a_exp
Expenditure on public and private institutions per student	educ_uoe_fini04
Learning mobility: - Degree-mobile graduates - Credit-mobile graduates	*DG EAC computation based on Eurostat / UIS / OECD data*

Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2020. The Structure of the European Education Systems 2019/2020: Schematic Diagrams. Eurydice Facts and Figures. Luxembourg: Publications Office of the European Union.

Comments and questions on this report are welcome and can be sent by email to:
Marina GRSKOVIC
Marina.GRSKOVIC@ec.europa.eu
or
EAC-UNITE-A2@ec.europa.eu

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