

Education and Training Monitor 2019

Estonia



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Education and Training Monitor 2019

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Volume 2 of the Education and Training Monitor 2019 includes twenty-eight 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 teachers and challenges of teaching profession. Section 4 looks at investment in education and training. Section 5 deals with policies to modernise early childhood and school education. Section 6 discusses measures to modernise higher education. Finally, section 7 covers vocational education and training, while section 8 covers adult learning.

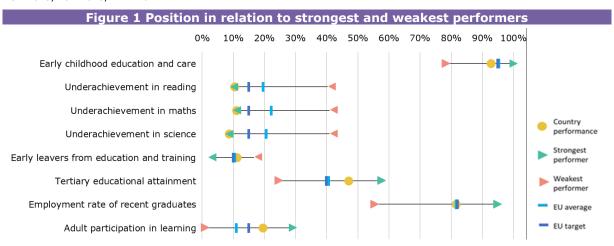
The Education and Training Monitor 2019 was prepared by the Directorate-General for Education, Youth, Sport and Culture (DG EAC), with contributions from the Directorate-General of Employment, Social Affairs and Inclusion (DG EMPL) and the Eurydice Network. DG EAC was assisted by the Education and Youth Policy Analysis Unit from the Education, Audiovisual and Culture Executive Agency (EACEA), Eurostat, Cedefop and the JRC's Human Capital and Employment Unit, Directorate Innovation and Growth. The Members of the Standing Group on Indicators and Benchmarks (SGIB) were consulted during the drafting phase.



1. Key indicators

•			Estonia		EU average	
			2009	2018	2009	2018
Education and training 2020 bend	hmarks					
Early leavers from education and training (age 18-24)			13.5%	11.3%	14.2%	10.6%
Tertiary educational attainment (age 30-34)			36.3%	47.2%	32.3%	40.7%
Early childhood education and care (from age 4 to starting age of compulsory primary education)			96.1%	92.9% 17	90.8%	95.4% ^{17,d}
Proportion of 15 year-olds underachieving in:	Reading Maths Science		13.3% 12.7% 8.3%	10.6% ¹⁵ 11.2% ¹⁵ 8.8% ¹⁵	19.5% 22.3% 17.7%	19.7% ¹⁵ 22.2% ¹⁵ 20.6% ¹⁵
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3 years before reference year)	S ISCED 3-8 (total)		67.7% ^b	81.7%	78.3%	81.6%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)		10.5%	19.7%	9.5%	11.1%
Learning mobility	Degree-mobile graduates (ISCED 5-8)		:	9.6% 17	:	3.6% 17
	Credit-mobile graduates (ISCED 5-8)		:	: 17	:	8.0% 17
Other contextual indicators						
Education investment	Public expenditure on education as a percentage of GDP		7.2%	5.8% 17	5.2%	4.6% 17
	Expenditure on public and private institutions per student in € PPS	ISCED 0	€1 714 ¹²	€5 199 ¹⁶	:	€6 111 ^{15,d}
		ISCED 1	€4 430 ¹²	€5 000 ¹⁶	€5 812 ^{12,d}	€6 248 ^{15,d}
		ISCED 2	€5 100 ¹²	€5 127 ¹⁶	€6 937 ^{12,d}	€7 243 ^{15,d}
		ISCED 3-4	€5 551 ¹²	€5 008 ¹⁶	:	€7 730 ^{14,d}
		ISCED 5-8	€6 414 ^{12,d}	€9 445 ¹⁶	€10 549 ^{12,d}	€11 413 ^{15,d}
Early leavers from education and training (age 18-24)	Native-born		13.8%	11.5%	13.1%	9.5%
	Foreign-born		: u	:	26.1%	20.2%
Tertiary educational attainment (age 30-34)	Native-born		35.9%	45.6%	33.1%	41.3%
	Foreign-born		44.6% ^u	73.8%	27.7%	37.8%
Employment rate of recent graduates by educational attainment (age 20-34 having left education 1-3	ISCED 3-4		65.2%	74.5%	72.5%	76.8%
years before reference year)	ISCED 5-8		70.5%	89.0%	83.8%	85.5%

Sources: Eurostat; OECD (PISA); Learning mobility figures are calculated by the European Commission's Joint Research Centre from UOE data. Further information can be found in Annex 1 and in Volume 1 (ec.europa.eu/education/monitor). Notes: EU averages of 2009 PISA do not cover Cyprus; d = definition differs, u = low reliability, := not available, 12= 2012, 14= 2014, 15= 2015, 16= 2016, 17 = 2017.



Source: European Commission, Directorate-General for Education, Youth, Culture and Sports (DG EAC) calculations, based on data from Eurostat (LFS 2018, UOE 2017) and OECD (PISA 2015).



2. Highlights

- > Estonia is developing an education strategy for 2021-2035, aiming to bring gradual changes to the system to respond to changes in the labour market and society.
- > Due to demographic trends and the limited responsiveness of the education and training system to labour market needs, aligning skills supply and labour demand remains a challenge.
- > The ageing of the teaching population coupled with the low attractiveness of the teaching profession are a long-term challenge for the functioning of the education system.
- > Participation in adult learning has reached a record high but the need for upskilling and reskilling remains high.

3. A focus on teachers

The teaching workforce is ageing but the number of students in teacher training programmes is insufficient to meet future demand. In Estonia, every second teacher in primary and secondary education is over 50 years old and almost every fifth is over 60. For the moment there is a degree of oversupply of teachers, reflected in the high number of part-time teachers. This is particularly the case in rural municipalities, where schools have less students and distances between schools are longer. However, many schools report difficulties in hiring teachers in specific subjects, particularly in mathematics, chemistry, physics, geography and biology (OSKA, 2018a), while university programmes to train subject teachers are generally undersubscribed. In parallel, the unmet need for support specialists (e.g. school psychologists, speech therapists, special education teachers, etc.) is high and expected to increase further as the inclusive education reform advances. The number of graduates from programmes preparing these professionals is also insufficient. However, the number of those in pre-school and primary school teacher training programmes is projected to be sufficient to meet future demand (ibid).

The teaching profession remains a low-status profession. Only 26.4% of Estonian teachers believe that their profession is valued in society (OECD, 2019a). Nevertheless, this percentage increased significantly compared to 2013, when it was only 14%. In general, teaching is considered stressful, salaries uncompetitive, and working conditions unattractive. Teachers report a lack of feedback and support from mentors, and insufficient cooperation with other teachers and parents (MoER, 2016). While generally unpopular, teaching is particularly unappealing to men, who account for only 17% of school teachers² (EU average: 28%; UOE, 2017). To improve the image of the profession, media campaigns were run and a national educational award was introduced in 2018 giving recognition to teaching. The authorities launched a working group to develop new solutions to tackle teacher shortages. More flexible pathways to the profession were introduced in 2013 to allow teachers to enter the profession with a combination of a pedagogical degree or a non-pedagogical degree at either bachelor or master's level. Nevertheless, the challenges arising from the lack of candidates to become teachers is seen as a risk to the successful functioning of the Estonian education and training system.

The government is increasing salaries to help make the profession more attractive. Between 2014-2018, teachers' salaries increased by more than 40% (NRP, 2019). On average, a school teacher working full time earns 113% of the average wage in Estonia. The intention is for salaries to reach 120% of the average wage, equivalent to the average pay for employees with a tertiary education degree. The government allocated funds to local administrations to top up the salaries of pre-school teachers, which are lower. In general, career prospects and teacher remuneration over their career are factors affecting the attractiveness of the profession (OECD, 2018a). However, minimum salaries have only been set at national level since 2013. As salaries are defined at school level³, they vary significantly across municipalities and across the system (state, municipal, private). More competitive salaries could improve gender balance in the profession, with evidence suggesting that countries with higher salaries tend to have a better

^{44%} of teachers in general education and 60% in vocational education and training (OSKA, 2018a).

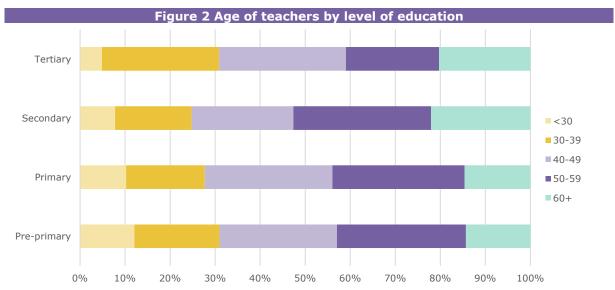
² ISCED 1-3.

Typically based on experience, extra qualifications and professional development activities (Santiago et al., 2016).



gender balance (OECD, 2018b). Nevertheless, even in countries with higher levels of pay, unattractive working conditions and the low status of the profession are factors that make teaching a less attractive career choice (ibid).

There is a need to improve teacher education programmes. Compared with the average of 23 EU countries⁴ surveyed in the 2018 Teaching and Learning International Survey (OECD, 2019a), Estonian teachers report a greater need for additional training in teaching students with special educational needs (26.1%; EU-23: 21%), teaching cross-curricular skills (17.2%; EU-23: 12.1%) and ICT skills for teaching (19.2%; EU-23: 16.1%). As the number of students with special educational needs in mainstream education increases, there is a need to better prepare teachers for this purpose in initial teacher education and continuing professional development (OSKA, 2018a). Teachers also report an insufficient level of digital skills, and that this is a major obstacle to teaching digital skills (Praxis, 2017). They often report difficulties in creating digital content and in problem-solving. Moreover, the Survey of Adult Skills showed that Estonian teachers have average or slightly below-average information processing skills but perform worse in problem-solving in a technology-rich environment (MoER, 2013).



Source: DG EAC calculations based on Eurostat and UOE, 2017.

4. Investing in education and training

Spending over the short- and medium-term is likely to be driven by the planned education reform. As a percentage of GDP, Estonia's general government expenditure on education is above the EU average (5.8% in 2017, against 4.9%). Spending on education is also high as a share of total government expenditure (14.8% against 10.2% in the EU), reflecting the importance attached to education and training policies at national level. Work has started on developing an education strategy for 2021-2035, which would also cover the use of EU funds between 2021 and 2027. The strategy is expected to make gradual changes to the system, such as revising the curriculum and introducing a new approach to learning. It seeks to foster more flexible transitions and more permeability between educational levels by stepping up cooperation between educational institutions through the 'Consortium' approach. To ensure a more efficient use of school resources, Estonia plans to further address demographic trends within the student population and the teaching workforce, for example, by giving further incentives to reorganise the school network and addressing the high share of part-time work among teachers.

Reorganisation of the general upper secondary school network needs to be finalised but overall investment needs in school infrastructure are expected to fall. Reorganising the

In 2018, 23 Member States participated in TALIS: Austria, Belgium fr, Belgium nl, Bulgaria, Croatia, Cyprus, Czechia, Denmark, England (UK), Estonia, Finland, France, Hungary, Italy, Latvia, Lithuania, Malta, the Netherlands, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden. TALIS 2018 covers lower secondary teachers and school leaders in mainstream public and private schools.



school network, partly financed by EU funds, is ongoing and will require further investment in the coming years (European Commission, 2019). However, a large part of the infrastructure plans – building or renovating buildings — has been completed, so investment needs are expected to fall compared to previous years. 15 out of the 24 planned state gymnasiums have already been opened, the network of vocational education schools was modernised and schools received EU funding to update their infrastructure to make them more energy efficient. In addition, the government offers financial support to basic education schools in return for discontinuing the provision of upper secondary education. The pace of reorganisation is uneven across municipalities. In 2018, 160 schools offered upper secondary education (compared with about 200 in 2013), though the reorganisation aimed to reduce this number to 100 by 2020. Out of 532 general education schools, almost a third are small (fewer than 100 students) or very small (fewer than 30 students). The need remains to continue the reorganisation of the network of upper secondary schools, alongside investing in improving the quality of the entire school network (NRP, 2019).

Box 1: The skills challenge in Estonia

Although the level of education is Estonia is high compared with many other EU countries, there are significant imbalances in aligning skills supply to labour demand. Existing data suggests that there is a shortage of cognitive and other transversal skills (OECD, 2019b). Employers expect more general knowledge from graduates of vocational education and training and more practical knowledge from higher education graduates.

There are labour and skills shortages in a number of sectors, including in ICT and construction, and emerging shortages in others (e.g. teachers). According to forecasts, half of those entering the labour market will need a higher education degree and a third will need a vocational education degree; however, the number of graduates in either track will not suffice to meet future needs (OSKA, 2018b).

Although young Estonians have a good level of basic skills, educational outcomes are lower in rural areas and among graduates of Russian-medium schools. Too many young people leave the education and training system too early, particularly young men. An increasing number of young people do not continue their studies after general upper secondary education.

27% of Estonia's workforce has no more than a basic or general upper secondary education and no professional qualifications (either vocational or higher education) (NRP, 2019). Although participation in adult learning is improving, existing skills shortages and mismatches suggest that the need for upskilling and reskilling remains high.

Estonia performs on average in terms of adopting high performance workplace practices and the strength of its innovation system (OECD, 2019b), while the research and innovation (R&I) system does not meet its full potential (European Commission, 2019).

To address these challenges, the 2019 country-specific recommendations call on Estonia to address skills shortages and foster innovation by improving the capacity and labour market relevance of the education and training system (Council of the European Union, 2019).

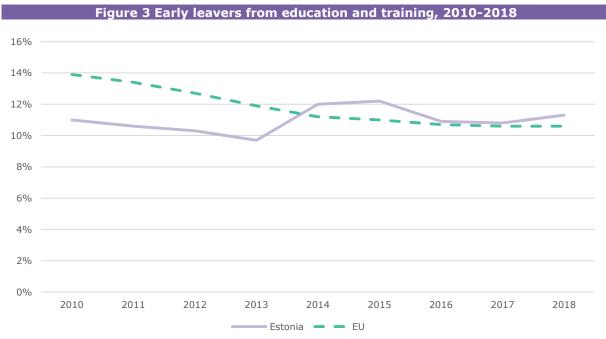
5. Modernising early childhood and school education

Participation in early childhood education and care is improving but is still below the EU average. In 2017, the participation rate for children aged 4 to compulsory education age increased to 93% (EU average: 95.4%). For children aged 0-3, the enrolment rate is 27% (EU average 34%), with parents' educational attainment not seemingly a determining factor (OECD, 2018a). Work has started on harmonising the legal framework and quality requirements for childcare and early childhood education. To support Estonian language learning from an early age, a pilot project providing Estonian speaking teachers in pre-school education groups was launched in the two regions with the highest proportion of Russian speakers. The objective is for children from Russian-speaking families to speak Estonian at A1 level⁵ by the time they go to school, with plans underway to extend the programme, according to the needs in Harjumaa and Ida-Virumaa.

⁵ A1 corresponds to a basic level of proficiency in the Common European Framework of Reference for Languages.



Too many young people leave the education and training system too early. At 11.3% in 2018, the rate of early leavers from education and training (ages 18-24) has not improved in recent years. It is above the EU average (10.6%) and Estonia's Europe 2020 target of $9.5^6\%$. Early school leaving is particularly problematic given the economic and demographic context: as the need for higher skills increases but the working-age population decreases, it is becoming increasingly important to ensure that young people acquire adequate skills and attain either vocational or higher education. Men are much more likely to leave the education system early (16.1% compared with 6.4% of women — the highest gender gap in the EU). The main factors affecting completion of upper secondary education are weak learning outcomes in basic education and lack of motivation, suggesting that interventions should be offered before students reach upper secondary education (MoER, 2018).



Source: Eurostat, LFS.

Proficiency in Estonian language for students with a different mother tongue remains a challenge. Less than 61.4% of graduates from basic schools where Russian is the language of instruction master Estonian at B1 level, well below the national target of 90%. Overall, 69.2% of all basic school graduates with a different mother tongue than Estonian reach the B1 level. This rises to 86% for students of immersion classes and to 99% for students educated in an Estonian-speaking environment (MoER, 2019). Language competences improve in upper secondary education, where at least 60% of the curriculum is taught in Estonian, with 83% of graduates of Russian-medium schools reaching level B2⁷. Apart from Estonian, having good English skills is perceived as important for competing on the labour market. However, there is a large gap in English-language performance between Estonian and Russian native speakers (MoER, 2018). As of September 2019, all graduates from upper secondary will be able to certify their language skills free of charge by taking an internationally recognised high-level test (Cambridge C1).

Box 2: School of the future

The 'School of the future' is a project financed by the European Social Fund. It aims to develop a new approach to learning by strengthening schools' capacity to innovate using evidence and to support teachers in becoming agents of change. Participating schools have the opportunity to analyse their challenges, set sustainable goals and develop plans for the future. Each school is assigned a consultant to work with on a regular basis, which includes online communication and weekly visits. Additional experts can be involved, depending on the schools' need.

⁶ 9% target under the Lifelong Learning Strategy.

⁷ B1 and B2 correspond to an intermediate level of language proficiency.



In practical terms, teachers receive support to develop innovative solutions and assess their effectiveness based on evidence, analysed jointly with Tallinn University. Monthly seminars are held to reflect on the process of change and to prepare next steps. At the school level, a steering group of 4-6 members comprising teachers and school leaders follow up by developing specific plans to implement the innovative solutions identified.

6. Modernising higher education

The number of new labour market entrants with higher education is insufficient to meet future labour market needs. The number of students entering higher education is falling due to demographic trends and the fact that an increasing proportion of upper secondary graduates do not continue studying, particularly men, Russian speakers, and graduates from schools furthest away from economic and administrative centres (MoER, 2017)⁸. Admission to doctoral programmes is also falling. The number of young people who graduate from higher education does not meet the future labour force demand (OSKA, 2018b). Although the number of foreign students is increasing, reaching 13% of admitted students, it is insufficient to offset labour market shortages as few remain in Estonia after graduation, mainly due to their lack of knowledge of Estonian. Although tertiary educational attainment in the age-group 30-34 is currently above the EU average (47.2% compared with 40.7%), it may worsen if the high dropout rates persist.

Higher education is insufficiently aligned with labour market needs. Employers often report mismatches in terms of transversal skills. These are critical for building a flexible workforce and include a variety of skills like creativity, critical thinking, entrepreneurship, autonomy and capacity for problem-solving. Two thirds of students in Estonia work whilst studying (Praxis, 2018), which enables them to acquire practical experience. However, as many students drop out or interrupt their studies to move into full-time work, this can lead to a situation where their skills do not meet employers' expectations (MoER, 2018). In addition, the actual number of graduates in science, technology, engineering and mathematics (STEM) – who play a key role in R&D investments – is also insufficient to meet labour market needs. This shortage reflects both the demographic trend and the fact that some STEM fields remain unattractive.

More women attain tertiary education than men but men are better paid. In 2018, 38% of men aged 30-34 had a tertiary education degree compared with 57.5% of women in the same age group. This gap has persisted. The employment rate for tertiary educated men who have recently graduated is higher than for women (93.3% vs 85.4%), which may be partly explained by parental leave arrangements. But even when employed, tertiary-educated women earn about 30% less than men. This high gender pay gap has been linked to a number of factors, including insufficient pay transparency, family care responsibilities and gender differences in the field of study (EIGE, 2017).

7. Modernising vocational education and training

The implementation of a new funding model for vocational education and training (VET) has started but is delayed due to funding constraints. The government introduced performance-based funding to promote innovation and better cooperation between schools and companies. However, only EUR 0.5 million were allocated for this purpose in 2019, compared to the EUR 12 million initially expected. Total enrolment in upper secondary VET⁹ in Estonia also increased slightly in 2017 compared with previous years, with 40.7% of students enrolled (UOE, 2017). However, this was still below the EU average of 47.8%. The share of VET students enrolled in programmes with workplace-based learning experience has doubled but, at 5%, it was still very limited.

Estonia promotes entrepreneurial skills in VET and supports teachers and trainers in acquiring these skills. Fourteen VET schools have taken part in the entrepreneurial programme together with general schools and higher education institutions. By 2020, 2 900 teachers and business/industry specialists (including VET teachers and trainers) are expected to attend in-

In 2017, 56% of upper secondary education graduates continued their studies in the academic year after graduation, 11 percentage point lower than in 2007. 9% of VET graduates continued to higher education, of which three quarters to professional higher education.

UOE data. The methodology for this indicator is different from the one in the Estonian Lifelong Learning Strategy.



service training in entrepreneurship education. 75 cooperation projects are planned to promote mutual learning between teachers, employers, learners, parents and other institutions. In 2018, 800 teachers followed in-service training in entrepreneurship education and 45 cooperation projects were launched in VET and general education institutions. A network was created for both career and entrepreneurship teachers to share new information and teaching practices. E-materials supporting teachers were compiled and integrated in the training material for pilot schools.

8. Developing adult learning

Estonian adults update their knowledge and skills through learning more often than the EU average but the need for upskilling and reskilling remains high, especially for the low educated. In 2018, 19.7% of adults aged 25-64 had had a learning experience (EU average: 11.1%). As the number of jobs requiring only a low level of education is decreasing, it is important to upgrade the skills of adults with low levels of education, including older workers. Participation in learning schemes has increased, including for the low educated (7.4% in 2018, EU average: 4.3%). However, the participation rate of this group remains considerably lower compared to highly educated workers in Estonia (28.8%, EU average: 19%). To increase the participation in learning amongst adults with a low level of educational attainment, there is a need to focus on attitudes and to provide learning opportunities tailored to learners' needs. The Estonian Quality Agency for Higher and Vocational Education started to develop a quality evaluation system for continuous training aiming to provide information about the quality of training for adult learners and to encourage providers to systematically improve quality.

The Unemployment Insurance Fund rules were revised to incentivise adult learning. Since 1 June 2018, the target group to receive formal education support and training vouchers was extended to cover people on temporary contracts. The income eligibility threshold for support was increased from the national median wage to the average wage (from about EUR 800 to 1 200 per month in 2018). Employers can now apply for support to provide Estonian language training to their employees.

Estonia plans to improve its skills governance system. With support from the European Social Fund, Estonia developed a comprehensive system to anticipate labour market needs and skills (OSKA). Since 2017, the European Centre for the Development of Vocational Education and Training (Cedefop) has provided technical advice with the aim of improving the management and coordination of skills anticipation, improving the take-up of recommendations and forging a close link between skills intelligence and the education and training system. The tool is expected to be further developed with the support of EU funding to improve the methodology and the implementation concept.

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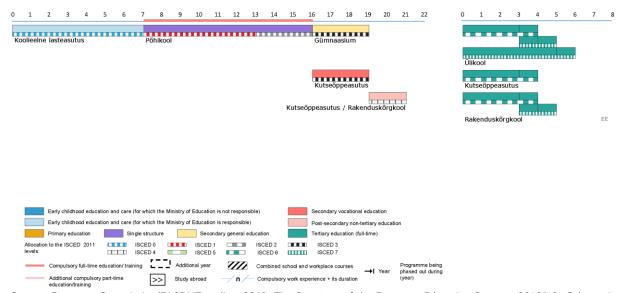
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Annex I: Key indicator sources

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 and care	educ_uoe_enra10			
Underachievement in reading, maths, 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	JRC computation based on Eurostat / UIS / OECD data			
- Credit-mobile graduates				



Annex II: Structure of the education system



Source: European Commission/EACEA/Eurydice, 2019. The Structure of the European Education Systems 2018/19: 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:
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Executive summary

Highlights of the cross-national analysis Highlights of the country analysis





Highlights of the cross-national analysis

Among all factors in the school environment, teachers are considered to have the greatest impact on students' learning outcomes. At the same time, more than $60\%^{10}$ of public expenditure in education in the EU is spent on teachers. Any policy effort seeking to improve educational outcomes – or the efficiency of education and training – is bound to take a close look at the role of teachers and look for ways to help teachers excel in their demanding profession. New evidence from the OECD TALIS survey sheds more light on teachers. The recent survey data inform the 2019 Education and Training Monitor, which contains a dedicated analysis of school teachers in the EU. Being a unique source of information on teachers' motivations, lifelong learning and careers, the new evidence from TALIS 2018 can help policy-makers harnessing the full potential of teachers by preventing and addressing challenges.

After the teacher-dedicated part, the 2019 Monitor sets to analyse the existing targets adopted by the Council of the European Union under the strategic framework for European cooperation Education and Training 2020 ('EU benchmarks'). This part of the report presents latest data on participation in early childhood education and care; early leaving from education and training; tertiary educational attainment; underachievement in basic skills; employment rate of recent graduates; adult learning; and learning mobility in higher education. Next, the 2019 Monitor offers analysis on education indicators used in other well-established or emerging priorities, including entrepreneurship education; digital education; multilingualism. The report concludes with a section analysing public investment in education and training.

At the core of learning: the teachers

Across the entire EU, education systems are confronted with a number of challenges relating to teachers. Several countries already face or are about to face shortages of teachers, either across the board or in particular subject areas (typically science, technology, engineering and maths); or in particular geographical areas. In view of the proportions of teachers aged 50 or plus, the 23 EU countries participating in TALIS 2018 will have to renew about one third of their teaching population in the next decade or so. At least five EU countries will have to renew around half of their secondary school teachers in the same period (Italy, Bulgaria, Lithuania, Estonia, Greece and Latvia; and the same applies to primary school teachers in the former three countries).

Successfully renewing the teachers' population requires acting upon key factors such as the number of students deciding to embark on teacher education, the number of new teachers starting in the job and the number of teachers stopping to work. To address this challenge, there is a need to improve the attractiveness of the profession and offer good working conditions for sustained professional activity.

According to survey data, only 18% of lower secondary school teachers in the EU consider their profession as valued by society; and their proportion lowers with longer years of teaching experience. Similarly, the share of teachers would still choose to work as teachers, declines significantly, in several EU countries, among more experienced teachers. Overall, there is a specific challenge in attracting men into teaching; and particularly so for primary and pre-primary education, where the proportion of female teachers reaches 85% and 96% respectively.

Salaries of teachers do not always compare favourably to salaries of other equally qualified professionals. Among EU countries with available data, in four countries (Czechia, Slovakia, Italy and Hungary) teachers at all education levels earn less than 80% of what other tertiary-educated workers do. In most Member States, primary (and especially pre-primary) teachers earn less than secondary level teachers. In secondary education, teachers' statutory salary tends to be higher at upper-secondary level than at lower-secondary level.

There are also shortages of teachers with specific profiles. Nearly 40% of principals in lower secondary schools in the EU declare that the shortage of teachers teaching students with special

DG EAC calculation on Eurostat's general government finance statistics, reference year 2017 (gov_10a_exp).



needs hinders the quality of instruction at their school. Principals also point to shortages of teachers who have competences in teaching in a multicultural or multilingual setting (the largest shortages are in France, Italy and Portugal); and competences in teaching students from socioeconomically disadvantaged homes (largest shortages in France, Italy, and Portugal). This second type of shortage is driven by change (technology; diversity in classrooms) and points to a need to improve training (initial and continued).

Furthermore, against an evolving technological and demographic background, teachers need new skills more than ever, including for dealing with cultural and linguistic diversity in the classroom, teaching in a technology-rich environment, and adopting collaborative teaching practices. While 92% of teachers report regular participation in professional development, 21% of them declare a further need for training on teaching students with special needs; 16% report a further need for training on the use of information and communication technology (ICT) for teaching; and about 13% report a further need for training in teaching in multilingual and multicultural environments.

Growing participation in education and educational attainment: main achievements in the last decade

In the last decade, the EU experienced a massive increase in tertiary educational attainment and met its target of having at least 40% tertiary graduates in the 30-34 year-old population – up from 32% in 2009. Despite this increase, there are clear patterns of inequalities in educational attainment. For example, on average, women's tertiary educational attainment (45.8%) is higher than men's (35.7%) – and the gap has been continuously increasing over recent years. Typically, women complete tertiary education earlier than men do. Also, young adults born in the reporting country or elsewhere in the EU, graduate more than their peers from non-EU countries (41.0% against 35.8% respectively). Yet, an overview of policy measures to broaden tertiary educational attainment shows that less than half of EU countries set specific targets to support participation in higher education of under-represented groups, such as, for example, people with disabilities, migrants or students from disadvantaged background.

The attendance of children from the age of 4 in early childhood education has expanded, and is, by now, almost universal. There are also high rates of participation in early childhood education by children from the age of 3. Yet the 90% participation rate for the general population decreases to 77.8% in the group of children at risk of poverty or social exclusion. Experiencing education in the early years of life has been found to be beneficial for better learning outcomes later on in life, and particularly so for children from socio-economically disadvantaged homes. The challenge of ensuring equal access to education in the early years needs to be addressed.

Since the EU cooperation framework in education and training started in 2009, the proportion of young adults leaving education and training without obtaining at least an upper secondary qualification has considerably reduced. Nonetheless, at EU level this process came to a halt after 2016. Comparing 2016 and 2018, there was progress on this indicator in large countries such as Spain or Poland, as well as in other countries such as Romania, the Netherlands and Portugal. However, this was countered by negative developments in other countries – for example, Italy, Sweden, Denmark, Slovakia, and Estonia (in descending order by size of population). Furthermore, in the past 2 years, early school leaving rates increased for both young adults born in the EU (between 2016 and 2017) and those born outside (between 2017 and 2018). Reducing early leaving remains a priority and a target of the EU, as those who leave education and training before obtaining an upper-secondary diploma will struggle with lower employment rates and lower rates of participation in adult learning.

The main challenge for the next decade: improving learning outcomes at school, and increasing adult participation in learning

Participation in education can be measured by data on enrolments, qualifications, or performance test. The latter show that reducing the number of underachieving 15-year-olds to meet the EU



target of less than 15% by 2020¹¹ remains a challenge, particularly for pupils from disadvantaged socio-economic backgrounds. Failing to achieve basic mathematics, reading or science tasks at the age of 15 impacts on individuals' chances to continue studying, find and maintain employment later in life, cope with fast-paced technological change, and develop as citizens. Between 2012 and 2015, the EU has actually moved further away from meeting this target. Approximately one fifth of pupils in the EU cannot complete basic reading tasks, and the share is slightly higher for science and maths (2015 data). Despite less favourable or sometimes adverse background conditions, around a quarter of socio-economically disadvantaged pupils born in another country are considered academically resilient. Individual factors associated with higher resilience include high academic expectations, and not repeating grades; while disengagement from school (for example skipping classes, and abusing substances) has a negative association with resilience. At school level, the use of school evaluations, connecting the students' test results to teachers' performance, adequate provision of study rooms and being surrounded by pupils with higher socio-economic status are all factors correlating positively with resilience.

Over the years, there has been limited growth in the share of adults participating in education and training during the last 4 weeks in the EU – from 9.5% in 2008 to 11.1% in 2018. In addition, in practically in all EU countries people with little or no qualifications in education – those most in need of access to learning – are the least likely to benefit from it. Age and educational attainment matter when it comes to adult participation in learning. Young adults (25-34) are more than four times more likely to participate in learning as those aged 55-64. Similarly, those with a tertiary degree are more than four times more likely to participate in learning than those holding at most an upper-secondary diploma.

Developing competences for future life and employment

Research has long established the positive outcomes of being able to study abroad. Transnational learning mobility is associated with future mobility, higher earnings, and lower risk of unemployment. 'Making learning mobility a reality for all' is one of the objectives of the European Education Area¹². In 2017, 11.6% of higher education graduates 'were mobile', meaning that they studied partially or entirely abroad. About 8% of them were abroad for short-term periods, while 3.6% graduated in another country. The Erasmus+ programme supported about half of the short-term study periods spent abroad by EU graduates. Overall, Luxembourg, Cyprus, the Netherlands, and Finland (in descending order) have high shares of mobile graduates. As to inward mobility, capturing the volume of students coming into a country for a period of study, it can be read as a measure of the attractiveness of the education system. On this indicator the United Kingdom leads the way – both in percentage of inward graduates and in absolute numbers.

There are a number of key competences (or combination of knowledge, skills and attitude) that can support an individual's life chances and also easier transition to the labour market and career job prospects. For example, participation in entrepreneurship education increases the likelihood of engaging in entrepreneurial activities later in life by 35% on average. Of this 35%, a 7 percentage point increase is due to improved self-perceptions by participants of their entrepreneurial skills. However, available data show that participation in entrepreneurship education in the EU is mostly optional, and only a handful of countries make it compulsory.

Furthermore, the potential of digital technologies in improving educational practices is being held up by challenges that education systems still face. To successfully undergo digital transformation, schools need to support teachers' digital competence for pedagogical use, design innovative pedagogical approaches, and provide digital equipment as well as better connectivity. Capacity

¹¹ Data for this benchmark come from the OECD PISA survey. Students scoring below level 2 are considered underachievers.

In November 2017, EU leaders met in Gothenburg to discuss the social dimension of Europe, including education and culture. As part of the debate on the Future of Europe, the Commission set out its vision and concrete steps to create a European Education Area by 2025. One of the main objective of the European Area of Education is 'making mobility a reality for all', by building on the positive experiences of the Erasmus+ programme and the European Solidarity Corps and expanding participation in them, as well as by creating an EU Student Card to offer a new user-friendly way to store information on a person's academic records. Other measures to boost mobility under the European Education Area include initiating new processes to ensure the mutual recognition of diplomas; improving language learning; creating a network of European universities; and supporting teachers and their mobility.



building for digital assessment needs to be implemented for learners, teachers, schools and education systems.

Moreover, speaking several languages can increase individuals' employment prospects. Overall in Europe, between 2005 and 2015, the number of pupils who experienced compulsory language learning grew both in primary and secondary education. As to the former, 83.7% of primary school children learned at least one foreign language in 2014, against 67.3% almost a decade before. At lower secondary level, 59% of pupils learned two languages in school in 2015, against 46.7% in 2005.

After reaching the lowest point in 2013 (75.4%), the employment rate of recent graduates has been continuously increasing in the EU. With 81.6% in 2018, the rate is now close to the pre-crisis 2008 level of 82%. However, some countries still suffer from the effects of the crisis on employability of recent graduates – in particular Greece and Italy, where employment rates of recent graduates are around 55%. As compared to secondary graduates holding a vocational qualification, those with a general orientation qualification have a less easy transition into the labour market (66.3% against 79.5%). The employment rate of tertiary graduates was at 85.5% in 2018.

Public investment in education

In 2017, EU Member States invested, on average, 4.6% of their gross domestic product (GDP) in their education systems. This proportion has been slightly but continuously decreasing in the last few years, down from 4.9% in 2014. On average, EU countries spend about one third of their public expenditure for education on pre-primary and primary education; 41% on secondary education; and 15% on tertiary education. Looking at different education sectors, real expenditure on secondary and post-secondary education decreased (-1.3%, between 2016 and 2017) and increased in pre-primary and primary education (+ 1.4%), as well as tertiary education (+ 1.7%). So far trends in education expenditure have been largely independent from demographic developments, with the partial exception of expenditure on tertiary education. Due to the predicted school-age population decline in many EU countries, even constant spending on education is likely to result in an increase in spending per student.



Highlights of the country analysis

Austria

To avoid teacher shortages, Austria needs to attract enough students into initial teacher education and improve continuing professional development. Investment in higher education aims to improve the study environment. Improving digital competence is a priority in the education and training system. Discontinued recent reforms may weaken efforts to integrate students with migrant backgrounds and to improve education outcomes of students from a socially disadvantaged background.

Belgium

The Flemish Community (BE fl) will implement reforms at all levels of education, including dual learning, starting in September 2019. The French Community (BE fr) will also implement school reforms, starting with changes to governance, then the new extended common curriculum and reforming initial teacher education from September 2020. Education spending in Belgium is among the highest in the EU, but educational outcomes are comparatively low, suggesting room for increased efficiency and effectiveness. To reduce inequality and improve outcomes, teachers need more support to manage diversity in the classroom. Tertiary educational attainment is high but disparities remain between regions and groups.

Bulgaria

The modernisation of the education and training system continues while quality, labour market relevance and inclusiveness remain challenging. Demographic trends and rising skill shortages suggest that Bulgaria needs to invest better in the skills of its current and future workforce. The need to upskill and reskill the adult population is high while participation in adult learning is low. The status of the teaching profession is low, and the teacher workforce is ageing. Salaries are being increased as a means to boost the attractiveness of the profession. Steps have been taken to increase the labour market relevance of vocational education and training (VET).

Croatia

Pilot implementation of curricular reform and ambitious preparations for full implementation are under way. Reforms are under way in vocational education and training. Participation in early childhood education and care is held back by shortages of teachers and places. Plans to expand the very short average instruction time could help to improve low education outcomes.

Cyprus

The teaching profession is highly attractive. Reforms to upgrade it are promising but need to be sustained and expanded. Reforms are implemented to foster high-quality public early childhood education and care. However, provision is insufficient for the early years. Tertiary education attainment has risen further but underutilisation of skills remains a challenge given the specific features of the Cypriot labour market. Measures have been taken to upgrade vocational education and training and adult learning, but attractiveness of both sectors and participation in them remain low.

Czechia

Czechia continues to make vocational education and training more relevant to the needs of the jobs market. Authorities are making good use of EU funds to support reforms. Inclusive education is progressing but measures targeted at Roma remain limited. The attractiveness of the teaching profession remains low.

Denmark

Changes to university education are making it more flexible and labour market friendly, but the need for more STEM graduates remains. The number of apprenticeships has been increased and measures are being taken to promote adult learning. Reduced education spending is having an impact on schools and universities. There is considerable local variation in the education performance of young people from migrant backgrounds.

Estonia

Estonia is developing an education strategy for 2021-2035, aiming to bring gradual changes to the system to respond to changes in the labour market and society. Due to demographic trends and



the limited responsiveness of the education and training system to labour market needs, aligning skills supply and labour demand remains a challenge. The ageing of the teaching population coupled with the low attractiveness of the teaching profession are a long-term challenge for the functioning of the education system. Participation in adult learning has reached a record high but the need for upskilling and reskilling remains high.

Finland

While teaching is a prestigious and attractive profession, there are teacher shortages for kindergarten and special needs education. There has been some growth in education inequalities, and spending on education has fallen. New policy measures aim to improve the quality, effectiveness and internationalisation of higher education. Demand for graduates in Information and Communications Technology (ICT) is high and difficult to meet. Implementation of vocational education and training reform is ongoing, and reforms are planned to foster adult learning.

France

Work continues on improving educational outcomes and reducing inequalities, with support for teaching staff and funding measures. A new law on education extends the length of compulsory education and training to 3-18. Authorities are faced with the challenge of combining the rapid pace of reforms with the need to consult stakeholders to ensure good ownership and optimal impact. Implementation of the vocational education and training reform is in full swing.

Germany

Germany has announced significant investments in digitalisation, higher education and research in the decade ahead, but as well in school education. Germany is preparing for fundamental change in the skills of its workforce by carrying out digital initiatives and by refocusing the system of adult learning. The teaching workforce is aging and Germany faces a challenge to replace a large number of teachers. Young people from disadvantaged socio-economic and/or migrant backgrounds continue to lag behind in educational attainment.

Greece

The teaching profession is highly attractive in Greece but opportunities and incentives to improve professionalism are lacking. Education expenditure is lower than in most EU countries and largely spent on salaries. Early school leaving has been further reduced, particularly in rural areas. Finding employment after education remains difficult, including for highly qualified people. Measures to tackle the brain drain of tertiary graduates are being implemented but internationalisation of Greek universities is underdeveloped.

Hungary

Recent measures have raised the qualification levels of staff in early childhood education and care. Measures to reduce performance gaps between pupils have been strengthened. Admission conditions for entry to higher education have been made more restrictive. A new medium-term strategy aims to modernise vocational education and training and adult education.

Treland

Ireland has a strong framework to ensure highly qualified teachers and further plans to meet emerging needs, including teacher shortages. Early school leaving has continued to decline, and participation in early childhood education and care is to be supported by new national schemes. Despite increased public spending on education, investment in higher education has not kept up with rising student numbers. Ireland implements initiatives aimed at upskilling and increasing adult participation in learning and training but the numbers of low-skilled adults in the population remain sizeable.

Italy

Italy invests well below the EU average in education, particularly in higher education. The share of teachers satisfied with their jobs is among the highest in the EU, but only a small share believe that theirs is a valued profession. Compulsory work-based learning in vocational education and training could help provide more structured training for apprentices and ease the transition from education to work. The level of tertiary educational attainment is low, and the transition from education to work remains difficult, even for highly qualified people.



Latvia

Latvia has already met and exceeded its Europe 2020 education targets. Latvia should achieve further improvements in learning outcomes through the new competence-based curriculum, a stronger individual approach to students at risk and support for inclusion of students with special educational needs. Enrolment in vocational education and training (VET) is increasing and the employment rate of VET graduates is improving, although both remain below the EU average. In higher education, a gradual increase in investment and incremental changes in quality assurance are welcome, but the sector remains fragmented and international competitiveness low.

Lithuania

Current trends in student population and teacher workforce call for a comprehensive strategy to manage teacher supply and demand. Improving key competences and relevant skills remains a priority at all levels. Further development of monitoring and evaluation systems may help improve the quality of education and training. Measures have been put in place to increase the education system's overall efficiency, but further efforts are needed to ensure their implementation. Policy measures to address low participation in adult learning are lacking.

Luxembourg

In 2018, more flexible entry requirements for the recruitment competition for early childhood and primary education teachers attracted more candidates. Pupils' performance is heavily influenced by their ability to cope with the trilingual system. A reform of the orientation process at the end of primary education may have stopped a trend whereby many pupils were being guided to the lowest track in secondary education. Employment rates among recent graduates from all types of education are significantly higher than the EU average.

Malta

Work is underway to improve the quality of teaching and the attractiveness of the profession. Improving the quality of investment in education and developing monitoring and assessment are key challenges. Increased participation in early childhood education and care and the new secondary system may help reduce the number of early school leavers. While participation in tertiary education is increasing, its labour market relevance is still a challenge.

Netherlands

The early school leaving rate is below the Europe 2020 national target but has slightly increased. The Netherlands faces an increasing shortage of teachers, both in primary and secondary education. The 2019-2022 Quality Agreements aim to improve the quality of vocational education and training. Dutch tertiary education increasingly attracts foreign students.

Poland

Early school leaving continues declining and participation in early childhood education and care among children under 3 remains low. The higher education reform has been launched, bringing major changes to the functioning of higher education institutions. Implementing the 2017 school system changes is causing organisational, financial and curricular challenges. Further challenges relate to teachers' pay, emerging shortages, and initial and continuing training. Participation in adult learning remains low.

Portugal

Teachers are satisfied with their jobs, but the ageing teacher population, the high proportion of non-permanent staff and weaknesses in induction and continuing professional development remain challenging. Investment to upgrade infrastructure is insufficient, particularly for early childhood education and care in metropolitan areas. Regional disparities in education outcomes, grade repetition and early school leaving rates are improving. Tertiary educational attainment has grown but business demand for ICT specialists exceeds supply. There is a significant proportion of low qualified adults while participation in adult learning remains low.

Romania

Concrete ideas have been presented for major reform of the education and training system. Clear steps need to be taken for the implementation of the reform. Public spending on education is low in EU comparison, while the sector's investment needs are high. Any major reform is likely to require additional funding linked to stronger equity and efficiency mechanisms. Better support for teachers – in particular by redesigning initial teacher education and strengthening continuing professional



development – can help improve quality and equity. Efforts were made to expand dual education. Participation in adult learning remains low despite the high need for upskilling and reskilling.

Slovakia

Slovakia is improving early childhood education and care, which is particularly positive for children from deprived families. Slovakia is taking a more strategic approach to lifelong learning, upskilling and reskilling. The early school leaving rate has continued increasing since 2010, approaching 14% in Eastern Slovakia. Investment in education and training is insufficient, and this is reflected in teachers' still low salaries despite recent increases.

Slovenia

Enrolment in early childhood education and care is approaching the EU benchmark. The proportion of Slovenian upper secondary students enrolled in vocational education and training is one of the highest in the EU, and the employment rate of such graduates is high. There are enough new entrant teachers but large numbers are approaching retirement and shortages already exist in certain categories. Tertiary educational attainment is high, but the differences between men and women and the native-born and foreign-born population are large.

Spain

The teaching profession is attractive, but working conditions differ among regions and between public and private education systems. Private spending in education is significant, while public spending is static compared to GDP. Planned reforms, reflecting political uncertainties, have been slowed down. The process to modernise vocational education and training is ongoing. Adult participation in education is slowly rising.

Sweden

Tertiary educational attainment and graduate employment rates are high. The population's digital skills are among the best in the EU. There is a serious teacher shortage, and a large number of teachers lack formal qualifications. School segregation and inequality are serious and growing concerns.

United Kingdom

Efforts are being made to tackle the high proportion of teachers leaving the profession. In England, school academies are growing in number but many are facing financial pressures. The consequences of Brexit for UK higher education are unclear but policy responses to address the potential loss of EU research funding and reduced student inflows will be needed. England will introduce new qualifications as part of ongoing reforms of upper secondary VET.

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