



European
Commission

Education and Training Monitor 2019

Luxembourg



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EUROPEAN COMMISSION

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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.

*The manuscript was completed on 26 August 2019.
Additional contextual data can be found online (ec.europa.eu/education/monitor)*

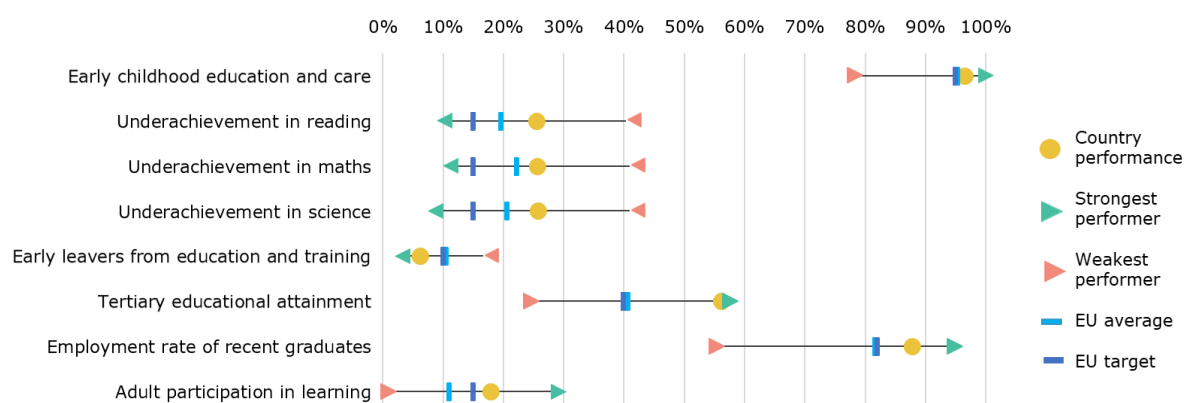
1. Key indicators

		Luxembourg		EU average		
		2009	2018	2009	2018	
Education and training 2020 benchmarks						
Early leavers from education and training (age 18-24)		7.7%	6.3%	14.2%	10.6%	
Tertiary educational attainment (age 30-34)		46.6%	56.2%	32.3%	40.7%	
Early childhood education and care (from age 4 to starting age of compulsory primary education)		94.6%	96.6% ^{17,b}	90.8%	95.4% ^{17,d}	
Proportion of 15 year-olds underachieving in:	Reading	26.0%	25.6% ¹⁵	19.5% ^{EU27}	19.7% ¹⁵	
	Maths	23.9%	25.8% ¹⁵	22.3% ^{EU27}	22.2% ¹⁵	
	Science	23.7%	25.9% ¹⁵	17.7% ^{EU27}	20.6% ¹⁵	
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% ^b	87.9%	78.3%	81.6%	
Adult participation in learning (age 25-64)	ISCED 0-8 (total)	13.8%	18.0%	9.5%	11.1%	
Learning mobility	Degree-mobile graduates (ISCED 5-8)	:	73.6% ¹⁷	:	3.6% ¹⁷	
	Credit-mobile graduates (ISCED 5-8)	:	6.9% ¹⁷	:	8.0% ¹⁷	
Other contextual indicators						
Public expenditure on education as a percentage of GDP		5.5%	4.7% ¹⁷	5.2%	4.6% ¹⁷	
Education investment	Expenditure on public and private institutions per student in € PPS	ISCED 0	€14 760 ¹²	€15 610 ¹⁵	:	€6 111 ^{15,d}
		ISCED 1	€14 986 ¹²	€15 907 ¹⁵	€5 812 ^{12,d}	€6 248 ^{15,d}
		ISCED 2	€15 156 ¹²	€16 004 ¹⁵	€6 937 ^{12,d}	€7 243 ^{15,d}
		ISCED 3-4	€15 169 ¹²	€14 460 ¹⁵	:	€7 730 ^{14,d}
		ISCED 5-8	:	€35 658 ¹⁵	€10 549 ^{12,d}	€11 413 ^{15,d}
Early leavers from education and training (age 18-24)	Native-born	5.4%	6.5%	13.1%	9.5%	
	Foreign-born	13.4%	6.0% ^u	26.1%	20.2%	
Tertiary educational attainment (age 30-34)	Native-born	36.5%	50.9%	33.1%	41.3%	
	Foreign-born	54.4%	58.6%	27.7%	37.8%	
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%	78.5%	72.5%	76.8%	
	ISCED 5-8	90.4%	94.0%	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 I and 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, 17 = 2017.

Figure 1 Position in relation to strongest and weakest performers



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

- In 2018, more flexible entry requirements for the recruitment competition for early childhood and primary education teachers attracted more candidates.
- Pupils' performance is clearly 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.

3. A focus on teachers

High salaries attract more young people and more men into teaching than in other countries. The proportion of teachers under 40 is over 40% in primary and lower secondary education. Teachers' salaries are the highest in the EU at all levels: the statutory starting salary for a lower secondary teacher (in purchasing power standards) is more than double the EU average and salaries increase subsequently in line with years of experience (European Commission, 2018). While a large majority of primary teachers are women, 46% of secondary teachers are men, the second highest proportion in the EU.

In 2018, more flexible entry requirements for the recruitment competition for early childhood and primary education teachers attracted more candidates. Despite the high salaries, Luxembourg faces a shortage of teachers, partly because of the requirement, in the teachers' competition, to demonstrate a command of the three official languages. In 2018, the conditions for applying for the primary education recruitment competition were relaxed and there were more candidates than in 2017. 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, the amended law on primary education (Government, 2018a) allows for the recruitment in 2018/2019 of candidates with a bachelor's degree in programmes related to primary education as temporary teachers. In 2016/2017, one in four primary and secondary teachers had a temporary contract.

Teachers' initial education and continuing professional development have been strengthened to improve the quality of teaching. As from September 2016, a three-year induction period has been introduced for all new teachers, both in primary education, where a similar traineeship did not exist, and in secondary education, replacing the previous two-year programme. The induction period is organised jointly by the school in which the trainee is based and the Training Institute for National Education (IFEN). Every trainee is mentored by a theoretical advisor from IFEN and a practical advisor from their school. Trainees are exempted from a certain number of teaching hours so that they can attend teaching theory classes and peer exchange sessions organised by IFEN. In 2018, the induction period was reduced from 3 to 2 years for teachers who had undergone a certified practice period of at least 20 weeks in the course of their studies. For appointed teachers, the requirement for continuing professional development was doubled to 48 hours every 3 years (Government, 2018b).

4. Investing in education and training

Public expenditure on education is around the EU average, but expenditure per student is the highest in the EU. Public expenditure on primary to tertiary education per student expressed in purchasing power standard was the highest in the EU in 2015, the last available data, at 16 222 (followed by Sweden with 10 844). Public expenditure on education as a proportion of GDP is not a fully reliable indicator in Luxembourg, given that the cross-border workers and the 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 10.9% on education in 2017, against an EU average of 10.2%.

The school population is growing and becoming ever more diverse. According to Eurostat projections, the school-age population (3-18 year-olds) is expected to increase by 16% by 2030 and by 31% by 2040 compared with 2020. Between 2010 and 2017, it increased by 4.7% and pupils with Luxembourgish as their first language became the minority both in primary (36%) and secondary education (47.3%) (MENJE, 2018). In total, only 41% of pupils speak Luxembourgish as their first language.

5. Modernising early childhood and school education

Box 1: For an equal start – enhancing access and quality in early childhood education and care (ECEC)

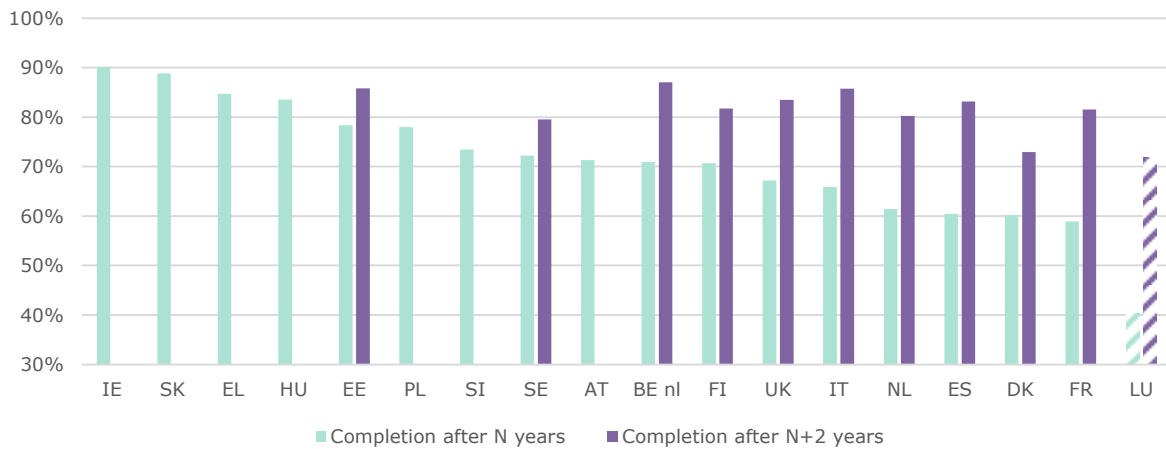
Compulsory education starts with two years of pre-school from age 4. 96.6% of children participate in ECEC (EU average: 95.4%), which can be supplemented with an optional year from age 3. In the face of rapidly increasing demand, Luxembourg has invested heavily in extending access to ECEC and non-formal education facilities in the last 10 years, nearly tripling the number of places and doubling the availability of parental assistants (Neumann, 2018). At 60.8%, the proportion of children below 3 who participate in ECEC is one of the highest in the EU.

In a second phase of policy intervention, the focus switched from access to quality. In 2016, the Youth Act established national quality standards in ECEC with which all providers had to comply 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. Every child is entitled to 20 hours per week of free education and care delivered by eligible providers, with additional hours for low-income families. ECEC providers are required to draw up general pedagogical concept that describes how their services are in line with the principles, characteristics and action areas of the national curriculum. They also have to document their professional activities. Regional agents have been appointed to advise on the content and formulation of the plans and visit the providers at least once a year. Compliance with the rules determines access to public subsidies and is required of all ECEC services, including home-based facilities.

Luxembourg's early school leaving rate, as measured by the Labour Force Survey in line with standard EU practice, stood at 6.3% in 2018. This is significantly below the EU average of 10.6%, 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 the cases of pupils at risk of drop-out because of the inappropriate use of available resources or flaws in the school system or legislation.

15 year-olds perform significantly worse than the EU average in all three subjects in the OECD programme for international student assessment (PISA) tests (mathematics, reading and science). Luxembourg's average performance, already below the EU average, worsened between 2012 and 2015, especially in science. The impact of socio-economic background on performance is the second strongest in the EU. It outweighs (by 2.7 times) the impact of the language spoken at home (MENJE and the University of Luxembourg, 2016) and even migrant background. When one adjusts for socio-economic status, the performance gap for children both of whose parents were born abroad is reduced by two thirds (OECD, 2017).

Grade repetition is frequent 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, where 77% of final grade pupils will have repeated a year at least once (MENJE, 2018b). In general secondary education, 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).

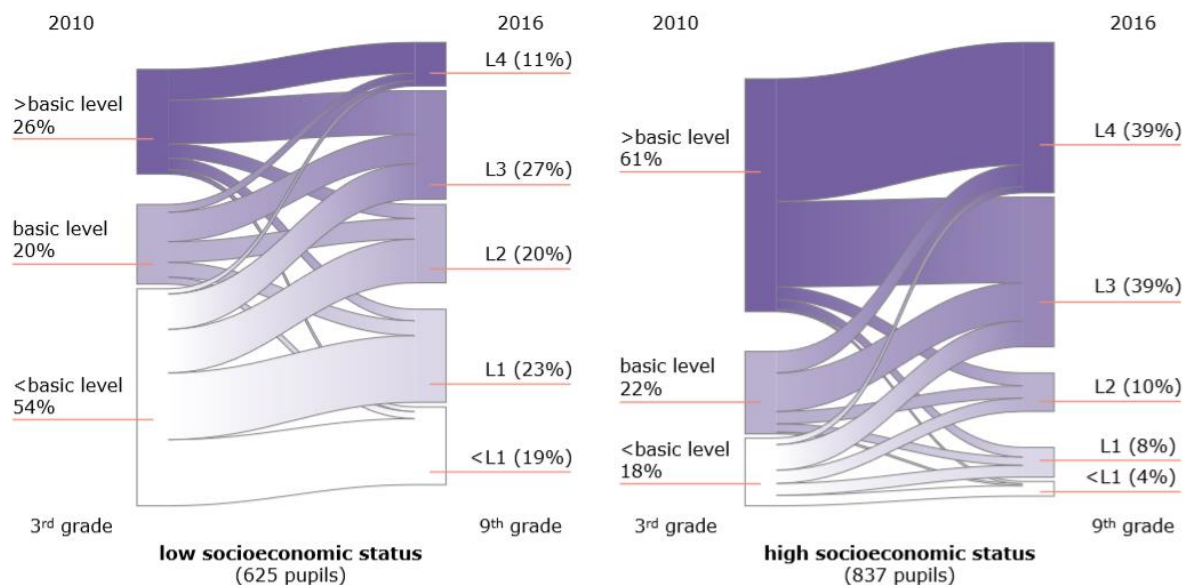
Figure 2 Successful completion of upper secondary programmes


Source: OECD (2014).

The 2017 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. Between 2006 and 2016, the proportions of pupils guided to the academic track (*enseignement secondaire classique*) and the technical track (*enseignement secondaire général*) fell steadily, while those going to the lowest, vocational track (*voie préparatoire*) increased from 6% to 15%. Pupils with lower socio-economic status and foreign nationality are the most likely to fall behind in all subjects and to be guided towards the lower tracks. Changing tracks is extremely rare (Klapproth et al., 2013). In 2017, the orientation process was reformed to give parents a say in the decision. Following this, 98.2% of orientation decisions were in line with the parents' wishes, whereas previously this had been the case with 84%. This may explain the trend shift in 2017/2018, when the proportions of pupils in the two higher tracks increased again and the proportion in the vocational track dropped from 15% to 12.2%. Monitoring is needed to determine whether pupils with lower socio-economic status are benefiting equally from this shift.

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 for French) are taught in German. While the main teaching language in technical secondary education remains German, in the higher tracks mathematics is taught in French, which is the language of the final exam. Several technical schools offer all courses in French. In general secondary education, the teaching language switches from German to French in grade 7 for mathematics and in grade 10 for other subjects. This system is challenging for all, but especially for the 59% of pupils who speak a language other than Luxembourgish at home. In the national competence tests, nearly half of all grade 3 pupils (45%) fail to show basic reading competence in German, the teaching language in primary education (Martin et al. 2012). Language skills have a major impact on pupils' performance in mathematics, too: when adjusting for pupils' level of reading comprehension in the test language and their socio-economic status, most differences in performance disappear (Martini and Ugen, 2018). Socio-economic status is the factor that has the biggest impact on school performance: more than half the pupils in the bottom quarter of the socio-economic scale perform below the basic level (*niveau socle*) in grade 3 and the proportion of those failing to achieve basic level (level 2, L2) by grade 9 drops much less than among their counterparts in the top quarter, irrespective of their mother tongue (Sonnleitner et al., 2018) (Figure 3).

Figure 3 Pupils' development in German reading skills – comparison of pupils of low socioeconomic status (Q1) with pupils of high socioeconomic status (Q4)¹



Source: Sonnleitner et al. (2018).

The quality assurance system has been strengthened. Like primary schools, secondary schools are now also obliged to adopt school development plans every 3 years. Since September 2016, they have been assisted in the design and implementation of the plans by the Pedagogical and Technological Research and Innovation Coordination Service (SCRIPT). The 15 regional inspectorate offices created by the law of May 2017 are responsible for the administrative management and pedagogical supervision of primary schools, monitoring implementation of the school development plans and organising support for pupils with special educational needs. This means that the heads of the offices act as directors to the primary schools. The chair of the school management committee is responsible for the school's operation, but does not have employers' rights over the other teachers. Secondary schools have their own heads within the school. In March 2018, a National Observatory on School Quality was created to gather and analyse evidence on the school system and the functioning of primary and secondary schools.

In 2017, secondary education was reformed in line with the needs of an increasingly diverse school population. The main objective of the new law on secondary education is to address learners' needs better by giving schools more autonomy to organise the curriculum, depending on which of the three 'profiles'² they opt for. The school development plans will need to reflect the needs of the school population and cover aspects such as guidance, study success, after-school activities, psycho-social assistance and the improvement of digital skills. The number of subjects covered for the upper secondary leaving certificate has been reduced to allow pupils to focus on those that match their further study plans. The OECD and the secondary school teachers' trade union have warned of the risk of reducing educational equity (SEW, 2017) and pupils' increasing segregation because of the fragmentation of school systems (OECD, 2018).

Schools are encouraged to embrace ICT and new technologies. Luxembourg is among the top performers in the EU's digital economy and society index (DESI). It ranks high on human capital, in particular the use of digital skills and the internet. Still, according to the ADEM employment agency, 70% of posts in the ICT, services and financial sectors remain vacant. In 2017/2018, ICT was introduced as a new subject in the classical secondary curriculum. The syllabus includes an introduction to programming, IT security, databases and technical IT.

¹ The chart concerns only pupils who regularly progressed in the national school system from grade 3 to 9, i.e. without repeating a year or switching to private education or a school abroad.

² The three possible profiles are:
(i) 'future hubs', with an emphasis on ICT, science and new technologies;
(ii) entrepreneurial schools; and
(iii) schools specialising in sustainable development.

6. Modernising higher education

Luxembourg has set itself the target of raising the tertiary attainment rate among 30-34 year-olds to 66% by 2020. It already has one of the highest rates in the EU (56.2%), partly thanks to the high proportion of graduates in the migrant population (58.6%, as compared with 50.9% of native Luxembourgers). In 2017 Luxembourg had the second largest proportion of international graduates³ in the EU at master's (43%) and doctoral level (167%). Study programmes are bilingual, trilingual (French, German, English) or entirely in English.

There is virtually full employment of young secondary and tertiary graduates in Luxembourg. In 2018, the employment rate for young (20-34 year-old) tertiary graduates was 94.0%, well above the EU average of 85.5%. The employment rate among those with upper secondary or post-secondary (non-tertiary) education was similarly high (95.4%, against an EU average of 79.5%). Tertiary graduates enjoy a higher wage premium than their counterparts elsewhere in the EU (OECD, 2017).

Luxembourg continues to raise financial support for students to meet the strong demand for highly skilled workers. Following a 2013 European Court of Justice ruling, children of parents who work in Luxembourg but live in a neighbouring country became eligible for state support for their studies. This led to a sharp rise in the number of students who received a grant in 2013/2014 - from just under 15 600 to more than 25 200 - and this growth has continued. The level of support per student has also increased sharply. Financial aid has three components: a basic part, a mobility part and a social part, with a view to making the system more equitable. All students are eligible, regardless of the country in which they study.

Funding for higher education and research has increased by 25% between 2014-2017 and 2018-2021. Luxembourg is spending EUR 1.436 billion on higher education and research in the current financing period (MESR, 2019). The 2018-2021 agreement provides for an overall budget of EUR 766.84 million for the University of Luxembourg and EUR 383 million for the three public research institutes. A further EUR 265.4 million has been earmarked for programmes financed from the national research funds. In higher education, a range of bachelor's and master's programmes are on offer, as well as doctoral studies, mainly at the University of Luxembourg. In addition, some secondary schools run short-cycle programmes leading to advanced technical diplomas. Expenditure on higher education includes public financial aid for students (see above).

New legislation strengthens the organisational and decision-making autonomy of the University of Luxembourg. Organisational autonomy was the only aspect in which the University scored low in 2017, while it ranked high in terms of financial, academic and staffing autonomy, according to the European University Association's autonomy tool⁴. A new law (Government, 2018a) aims to increase its autonomy in terms of internal organisation and decision-making and to set clearer rules on its management structures and decision-making procedures. The rector is established as chief executive. The role of the university council has been extended to determining the orientations of study programmes, contributing to study regulations and proposing two members for the university governing board. The law also provides for student participation in decision-making and facilitates collaboration with other research institutes in Luxembourg.

An amendment of the Higher Education Act aims to improve the quality of foreign tertiary education providers. The amendment (Government, 2018b), addresses the organisation, relevance and quality assurance of programmes and introduces a reference to external and independent quality assurance agencies which have to be members of ENQA and registered at EQAR.

7. Modernising vocational education and training

Vocational education and training (VET) graduates enjoy excellent employment prospects. In 2017, the proportion of pupils enrolled in upper secondary VET programmes was 61.6%, against an EU average of 47.8%. The employment rate among recent VET graduates is 95.4%, well above the EU average of 79.5% and even above that for tertiary graduates. However, grade repetition remains a major challenge in technical secondary education (see Section 5).

³ Inward degree mobility rates are computed as inward degree-mobile graduates as a percentage of graduates originating in the country.

⁴ European University Association: <https://www.university-autonomy.eu/countries/luxembourg/>.

New legislation addresses certain framework conditions in VET. In June 2019, the 2008 VET Reform Act was amended to address a series of technical issues, including:

- extending the length of the training period to improve completion rates;
- introducing a form of training for people already in employment; and
- integrating the contracts for apprenticeships and work placements in the Labour Law in order to improve legal certainty.

Cross-border cooperation has been strengthened to ensure apprenticeship places. In March 2018, Luxembourg signed a bilateral agreement with the German *Land* of Rhineland-Palatinate that was modelled on the 2017 agreement with the Lorraine region in France. Both are based on a 2014 framework agreement aimed at boosting cross-border mobility in VET and thereby strengthening the labour market in the *Grande Région* (i.e. Luxembourg and the bordering regions of Belgium, France and Germany). In September 2018, a total of 150 VET students were involved in apprenticeship mobility across the *Grande Région*.

Box 2: The macro-reform of vocational education and training

European Social Fund project (July 2017 — December 2019)

Budget: EUR 860 200

Implementing body: *Service de coordination de l'innovation et de la recherche pédagogiques*

The project is aimed at creating a coherent and efficient system to analyse and revise VET programmes and to adapt some 120 curricula to the new legislative and regulatory framework. The revision should make it easier to switch between vocational programmes and educational levels ('*Kein Abschluss ohne Anschluss*' – 'no dead-end qualifications').

8. Developing adult learning

Luxembourg has a growing and mixed population, 47.5% of whom are foreign-born (STATEC, 2019a). Between 2009 and 2018, it saw the highest rate of population growth in the EU (+22%). Foreign-born employees are strongly represented at both ends of the employment spectrum, holding both low-qualified and highly qualified positions (OECD, 2017). On average, migrants tend to be highly educated: 58.6% of migrants aged 30-34 have a tertiary degree. As a result, migrants enjoy a significantly higher employment rate (70.8%) than the native-born population (61.2%).

Overall participation in the labour market and adult learning is high, but lower among low-skilled and older workers. Employment rates are higher than the EU average across all levels of education, including for low-skilled workers: in 2018, the proportion of low-qualified adults in employment stood at 60.8%, against an EU average of 56.8%. 18% of adults surveyed had had a learning experience in the previous four weeks, against an EU average of 11.1%. However, participation in adult learning is much less common among low-skilled workers (7.3%), increasing the risk of their skills becoming outdated and of them ending up in early retirement. The employment rate among older workers (55-64 years) remained particularly low (42.3%) in 2018, against a 59.3% EU average, making it especially important to improve their participation in lifelong learning. A July 2017 amendment to the Labour Law created incentives for companies to provide training for their employees and changed the state co-financing arrangements for this. In 2018, the public employment service and the chamber of commerce launched a joint programme to improve job-seekers' employability. The 'Skill you up' programme includes skills assessment, coaching, training and follow-up for those wishing to move to another occupation and/or sector.

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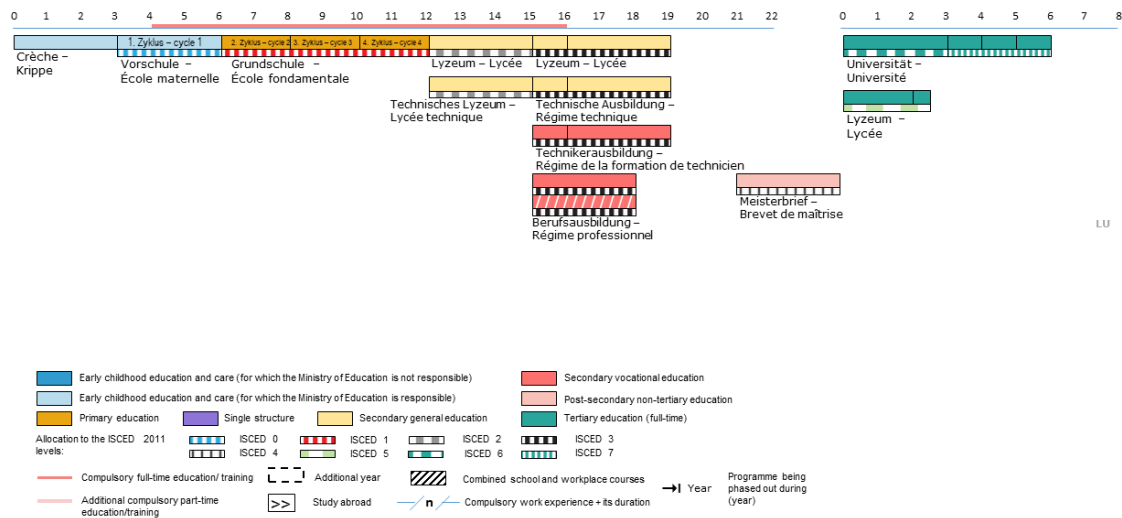
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Annex I: Key indicator sources

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, 2018, *The structure of the European education systems 2018/19: Schematic diagrams*. Eurydice Facts and Figures. Luxembourg (Publications Office of the European Union).

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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%⁵ 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

⁵ 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 socio-economically 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 2020⁶ 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 Area⁷. 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

⁶ Data for this benchmark come from the OECD PISA survey. Students scoring below level 2 are considered underachievers.

⁷ 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.

Ireland

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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