



European
Commission

Education and Training Monitor 2019

Denmark



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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.

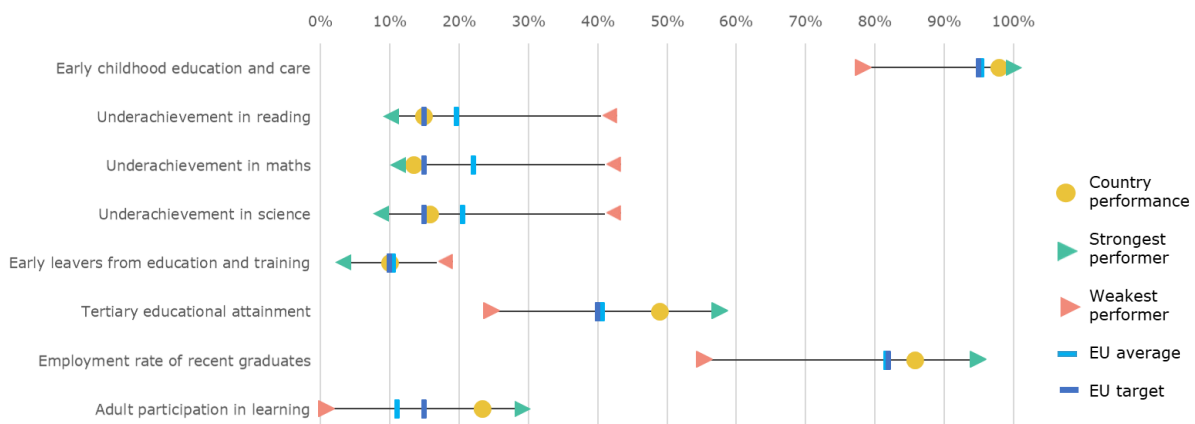
*The manuscript was completed on 26 August 2019.
Additional contextual data can be found online (ec.europa.eu/education/monitor)*

1. Key indicators

		Denmark		EU average	
		2009	2018	2009	2018
Education and training 2020 benchmarks					
Early leavers from education and training (age 18-24)		11.3%	10.2%	14.2%	10.6%
Tertiary educational attainment (age 30-34)		40.7%	49.1%	32.3%	40.7%
Early childhood education and care (from age 4 to starting age of compulsory primary education)		91.9%	98.0% ¹⁷	90.8%	95.4% ^{17,d}
Proportion of 15 year-olds underachieving in:	Reading	15.2%	15.0% ¹⁵	19.5% ^{EU27}	19.7% ¹⁵
	Maths	17.1%	13.6% ¹⁵	22.3% ^{EU27}	22.2% ¹⁵
	Science	16.6%	15.9% 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)	87.9%	85.9%	78.3%	81.6%
Adult participation in learning (age 25-64)	ISCED 0-8 (total)	31.3%	23.5%	9.5%	11.1%
Learning mobility	Degree-mobile graduates (ISCED 5-8)	:	1.5% ¹⁷	:	3.6% ¹⁷
	Credit-mobile graduates (ISCED 5-8)	:	9.2% ¹⁷	:	8.0% ¹⁷
Other contextual indicators					
Public expenditure on education as a percentage of GDP		6.9%	6.5% ¹⁷	5.2%	4.6% ¹⁷
Education investment	Expenditure on public and private institutions per student in € PPS	ISCED 0	€8 353 ¹²	:	€6 111 ^{15,d}
		ISCED 1	€8 385 ¹²	:	€5 812 ^{12,d}
		ISCED 2	€8 773 ¹²	:	€6 937 ^{12,d}
		ISCED 3-4	€7 624 ¹²	:	€7 730 ^{14,d}
		ISCED 5-8	:	:	€10 549 ^{12,d}
Early leavers from education and training (age 18-24)	Native-born	11.0%	10.2%	13.1%	9.5%
	Foreign-born	15.8% ^u	9.9% ^u	26.1%	20.2%
Tertiary educational attainment (age 30-34)	Native-born	42.4%	47.9%	33.1%	41.3%
	Foreign-born	27.5%	53.1%	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	84.2%	83.4%	72.5%	76.8%
	ISCED 5-8	91.0%	87.8%	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 in Volume 1 (ec.europa.eu/education/monitor). Notes: The EU's 2009 PISA averages do not include 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 Sport (DG EAC) calculations, based on data from Eurostat (LFS 2018, UOE 2017) and OECD (PISA 2015).

2. Highlights

- 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.

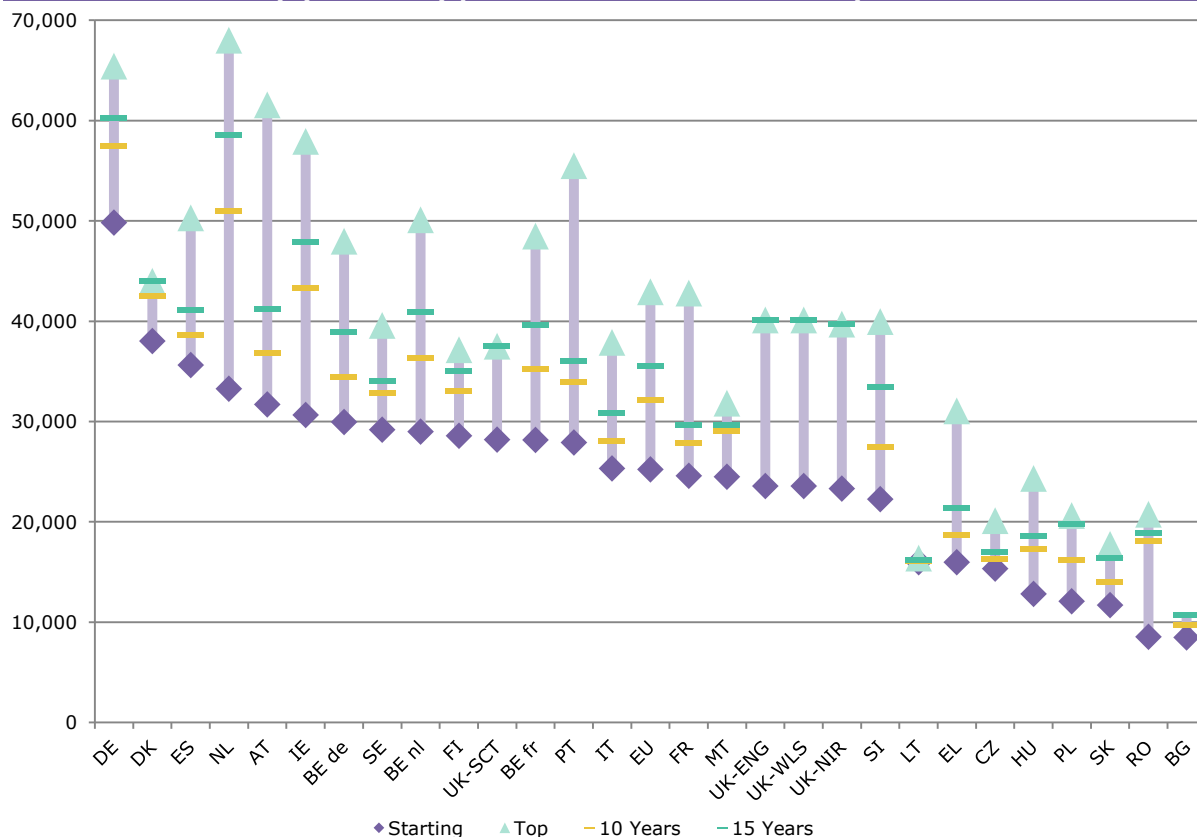
3. A focus on teachers

Denmark is facing teacher shortages and class size increases. 45% of lower secondary teachers are 50 or older, 10 pps above the EU average. Teacher numbers underwent a prolonged reduction between 2009 and 2018, dropping by 11.8%, more sharply than the concurrent decline in pupil numbers of 7% (Danmarks Lærerforening, 2018). The nationwide shortage of teachers is shown by the increase in average class sizes in primary and secondary school between 2005 and 2016 by, respectively, 10% and 9%, to 21 pupils per class (OECD, 2018). The need to attract teachers among other reasons has motivated municipalities to enter into their own agreements with teacher unions. In 2017/2018, 70 out of 98 municipalities had signed agreements regulating working hours, flexible working time, definition of tasks including preparation, in-service training and assessment. Denmark is divided into five different zones allowing for different salary levels. Unions have now agreed that part of the salary can be negotiated with each school, leading to emerging pay differentials between municipalities (Representative, 2019).

Teachers' starting salaries are generous but progression is flat. A Danish primary or lower secondary teacher starting their career in the 2016/2017 school year received an annual 38 040 in purchasing power standard (PPS), the highest amount in the EU after Luxembourg and Germany (European Commission/EACEA/Eurydice, 2018). However, salary progression is very flat: salaries increase by only 12% after 10 years and 16% after 15 years, so that the maximum salary of 43 980 PPS is only slightly above the EU average (see Figure 2). Pre-primary teachers earn about 10% less than primary and secondary teachers. Compared with the earnings of tertiary-educated workers, Danish teachers earn between 68% in pre-primary and 95% in upper secondary education (OECD, 2018). According to data from the 2018 OECD Teaching and Learning International Survey (TALIS), salary, job security and a steady career are weaker motivating factors for Danes than for teachers elsewhere in the EU; Danish teachers say they are more motivated by making a contribution to society and influencing the development of the young. Their job satisfaction is close to the EU average (89%); as elsewhere, it dips somewhat after 5 years in service. They are less likely than the EU average to report that they would still choose teaching as a career (-5.3 pps for young teachers, and -7.9 pps after 5 years). A lower than average proportion say teaching was their first career choice (OECD, 2019).¹

¹ 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.

Figure 2 Annual basic gross statutory salaries in PPS for full-time teachers in lower secondary (ISCED 24) public schools for the school year 2016/2017



Source: Eurydice, 2018. Note: For the sake of clarity of comparison between countries, Luxembourg is not presented here.

After the reform of the *Folkeskole* (general compulsory education), teaching time other than in upper secondary level is among the highest in the EU. A Danish lower secondary teacher taught on average 784 hours a year in 2015, far above the EU average of 665 hours and the second highest after the UK. However, this is reversed at upper secondary level, where an average of 405 hours in 2017 puts Denmark at the bottom of the EU ranking (OECD, 2018).

A 2017 law allows municipalities to exceptionally engage teaching staff without a full teacher qualification. This weakens the quality approach at the centre of the *Folkeskolen* reform (2013) that had set the objective that 95% of teachers teaching a specific subject should be fully qualified. The number of fully qualified teachers employed by municipalities dropped from 89.2% in 2013 to 83.8% in 2016 but recovered to 86.7% in 2018.

Box 1: Teachers obtain a professional bachelor degree from university colleges

A major reform of teacher training took place in 2012. Teacher training was constructed around modules, and university colleges (*Professionshøjskoler*) were given more autonomy to set programmes for different teacher profiles (OECD, 2014).

The first results from an evaluation started in 2017 show school principals are satisfied with the competencies and skills of new teaching graduates. However, graduate teachers are less convinced that they are well prepared to work together with parents and other teachers. Teaching unions propose to shift initial teacher training to a master degree at university level, as in other Nordic countries, as a response to the increasingly complex situation teachers face in school and in society.

Some in the national research community suggests that adopting features of the Finnish model (master level, training 1 year longer and more academic, but also time in practice schools) might further increase motivation and competencies (Andersen, 2017).

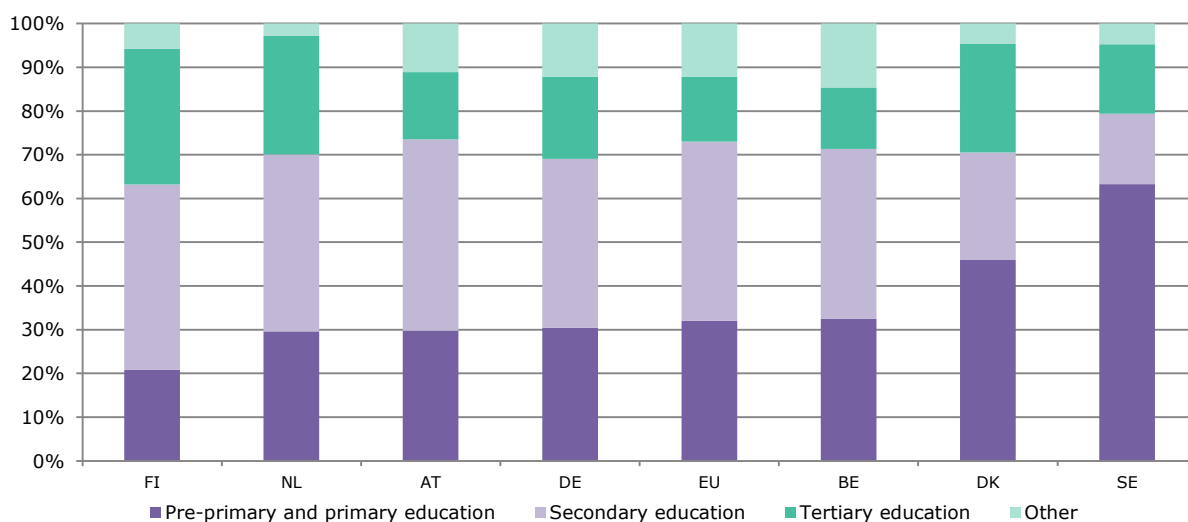
Teachers' continuing professional development (CPD) is devolved to municipalities (European Commission, 2018). The proportion of Danish teachers who feel well or very well prepared for using information and communications technology (ICT) for teaching (39.5%) is around the EU average. TALIS 2018 shows that less than half of teachers report that ICT was covered in their initial training education (46.7%, 6.2 pps under the EU average) while 11.2% report a need for professional development in this area, 4.9 pps below the EU average. Danish teachers feel more prepared to teach in a multicultural and/or multilingual setting than the EU average (26.3% v 23.8%) and also that this issue has been integrated into their training (36.8% v 31.7%). However, 51.2% believe that CPD is too expensive (EU 44%). Over DKK 1 billion (EUR 170 million) has been allocated to strengthening CPD over 2014-2020. Free courses addressing specific needs are offered by municipalities (European Commission, 2019).

The *Folkeskole* Act entrusts responsibility for administrative and pedagogical management to school leaders. This includes the professional development of teachers and teacher appraisal. School leaders have full autonomy to decide if, how and when teachers are to be appraised, without any involvement by top-level authorities (European Commission, 2019). Training school leaders has been a recent priority, with 75% of school leaders now being certified in management. Research underlines the important role of school leaders for the self-esteem and motivation of teachers. Teachers feel that their autonomy was restricted by the *Folkeskolen* reform, but that school leaders have mitigated some of this effect (Andersen, 2015). This led the government to develop with stakeholders a new certificate for school leaders with a focus on pedagogical leadership, to be offered from mid-2019 (Skolelederforengen, 2018).

4. Investing in education and training

General government expenditure on education as a proportion of GDP decreased to 6.5% in 2017 but remains well above the EU average (4.6%). Expressed as a share of total general government expenditure, it remained broadly stable at 12.7% in 2017, again well above the EU average of 10.2%. Teachers' pay, at 51%, absorbs a much smaller proportion of spending than the EU average of 62.0%. Between 2010 and 2017, real (inflation-adjusted) expenditure increased by 33% in tertiary education, but remained broadly unchanged in secondary (-0.1%) and pre-primary/primary education (2.5%) (see Figure 3). There was a real spending fall of 2.7% between 2016 and 2017 affecting all levels other than pre-primary and primary schooling, which is likely to continue. Student-teacher ratios increased in the different education levels by between 9% and 43% between 2015 and 2018.

Figure 3 General government expenditure by level of education, 2017



Source: Eurostat, COFOG. Online data code: gov_10a_exp.

Denmark's school-age population is expected to continue growing. The school age population (3-18 year-olds) is projected by Eurostat to grow by 12% by 2040, in contrast to a decline in most other EU countries. The Council of the EU's 2019 country-specific recommendation to Denmark included the following: 'Focus investment-related economic policy on education and skills' (Council of the EU, 2019).

5. Modernising early childhood and school education

Participation in early childhood education and care (ECEC) is high. ECEC attendance by children between 4 and compulsory primary school age is 98.0% and has remained stable since 2010 (98.1%). Children aged over 26 weeks are legally entitled to full time publicly subsidised ECEC (European Commission, 2019). Participation by under-3s is also stable around 71.7% (2017), very high compared to other EU countries. ECEC institutions are usually open about 50 hours a week and, according to EU-SILC data, the majority of under-3s attend for more than 30 hours a week. There is practically no difference in attendance rates of disadvantaged and advantaged students (OECD, 2019a). Emotional and developmental support is a high priority in preschool, rather than instructional support or classroom organisation. Staff ratios (including assistants) are favourable by international comparison (OECD, 2019a) with some differences between institutions.

The quality of ECEC is somewhat uneven. Municipalities determine the children-to-staff ratios and the qualification mix of the staff employed. Municipalities feel differently the effects of the current climate of public spending cuts. In 2017, just over 60% of staff had pedagogical education (pedagogue or pedagogical assistant (Socialministeriet, 2017)). Two recent political agreements investing DKK 2 billion (EUR 268 million) provide for more pedagogical staff in areas with children from vulnerable background and for up-skilling of pedagogical staff (pedagogues, pedagogical assistants, leaders and childminders).

Mechanisms to help children make the transition to primary school after ECEC are important to support children from disadvantaged backgrounds. Children face a significant reduction in direct contact in the transition from ECEC to primary school (OECD, 2019a). In addition, the vacation before moving to primary school is particularly long. According to the OECD, pedagogical and developmental continuity may be lost in this transition. The fact that different bodies are responsible for these levels of education complicates the transition. There is, furthermore, full local autonomy, thus each of the 98 municipalities designs their own approach. The broad goal of facilitating the transition is specified by law and there are common child monitoring methods, including development reports, but differences in approach result in uneven transition quality (OECD, 2019a).

The *Folkeskolen* reform has not managed to improve student well-being or education outcomes as intended. The reform of comprehensive primary education initiated in 2013 and in force since August 2014 is being monitored closely. Neither school well-being nor educational or social well-being have shown improvement since 2014/2015 (VIVE 2019, NRP, 2019). Young people from disadvantaged and/or migrant backgrounds continue to show lower education results. While 55% of first-generation Western immigrants and 75% of Denmark's native-born population achieved good results in reading in the 2017/2018 national tests, only 36% of first generation non-Western immigrants did so. For mathematics the performance gap was similar. Second-generation immigrants do better but are still behind the native population. Other reform objectives, like strengthening physical education, increasing interdisciplinary education and strengthening school leadership, have shown better progress.

Having declined since 2010, the early school leaving rate has risen again from 2016 and stands at 10.2% in 2018. Most of the change is happening in cities, at a rate four times that in towns, while there was no change over 2010-2018 in rural areas. No research is available yet on why the downward trend has been interrupted. There is also a significant gender gap in the rate of 4.7 pps. However the gap between the native and foreign-born population is the smallest in the EU, at 0.3 pps (and only slightly larger for those born outside the EU, at 0.9 pps).

In August 2019, the length of the school day was shortened by three lessons a week. Municipalities are authorised to make further cuts. But the agreement also extends the number of lessons in some subjects, strengthens support teaching and grants more local autonomy. The Danish Association of School Leaders is critical of the reform, stating that it is underfunded.

6. Modernising higher education

The number of people aged 30-34 with tertiary qualifications continuously increased to 49.1% in 2018, with women (56.6%) outnumbering men (41.8%). Tertiary attainment rates vary considerably by region: in Hovedstaden (63.1%) they are nearly twice as high as in Syddanmark (37.7%). While the rates for the native-born (47.9%) and foreign-born populations

(53.1%) are relatively close, for people born outside of the EU it drops to 34.7%, the widest such gap in the EU after Slovenia. Only 21% of tertiary graduates in 2017 graduated in STEM (science, technology, engineering, mathematics) subjects, below the EU average of 25.8% and far below Germany with 35.6%.

The employment rate of recent graduates recovered to 87.8% in 2018. Employment rates generally are high. Upper and post-secondary level graduates from vocational training have better employability than those with general education only (85.6% vs 80%). Higher education (ISCED 5-8) provides only a weak boost to employability of 2.2 pps, one of the smallest advantages in the EU (EU average: 3.8 pps). However, there is a high earnings premium, with average annual income for tertiary-educated workers 65% higher in 2017 than for those with vocational education and training (VET) qualifications.

Danish universities remain attractive for students from abroad. 15.1% of the graduates in Denmark studying for a degree come from abroad. About half do so for doctoral studies, a quarter for master degrees and a fifth in short-cycle studies (7% for a full bachelor degree).² While the majority come from Europe, other regions are represented too, in particular Asia. About 10% of Danish graduates studied abroad, most of them for short-term credit mobility (8.4%) and about 1.4% for whole degree studies. Short-term mobility is highest at master level and degree mobility at PhD level with 5%.

The latest reforms make higher education more flexible and link it more closely to labour market needs. An Agreement from December 2018 introduced the possibility to introduce up to 25 one-year full-time professionally oriented master courses; to allow better opportunities for students to combine study and work³; and to allow for work experience between degrees. Having graduated with a bachelor degree, students have now up to three years to actually start with their guaranteed master programme. These reforms are welcomed by stakeholders like the Confederation of Industries and the Confederation of Academics. Recent reforms encourage higher education institutions to develop measures to foster talent. The 2015 'Education for the future' (*Uddannelser til fremtiden*) reform introduced the possibility of special talent tracks with extra credits. An evaluation showed that two out of three universities use broadly defined talent measures but also pointed to the need for funding to support further development in this respect⁴. Thus, in 2019, the Danish government allocated DKK 190 million (EUR 25.5 million) to a talent track aimed at supporting 5000 students. Narrowly supporting only talent in this way was criticised by the Danish University Association and student representatives, who consider that the 2% overall annual budget reduction since 2015 has eroded the funding of the higher education system.

7. Modernising vocational education and training

In 2017, 2% fewer new students entered formal VET programmes in Denmark. 38.9% of students enrolled in upper secondary education attended vocational programmes in 2017, a small reduction from previous years (and below the EU average of 47.8%). Students in VET had some exposure to work-based learning — most educational programmes provide for some practical elements in the curriculum. The employment rate among recent VET graduates in 2018 increased to 85.6% from 82.8% in 2017, staying above the EU average of 79.5%.

The number of apprenticeship places is increasing and a new action to boost awareness and motivation has been introduced. One major issue has been a shortage of apprenticeship places. With more than 2 800 apprenticeship places created in 2018, the target of 2 100 new places for 2019 was more than reached (NRP, 2019). A tripartite agreement aimed at attracting young people into VET and increasing completion rates was concluded in August 2017. In November 2018, the Parliament agreed a DKK 2.3 billion (EUR 308 million) action to increase learners' awareness of and motivation for VET programmes from an early age. It involves a stronger focus on practical skills in lower secondary schools, with compulsory VET-related subjects and exams, and a stronger involvement of municipalities in guidance and counselling.

² Source: Calculations by the European Commission's Joint Research Centre, based on Eurostat (UOE, 2017).

³ The accord also set aside funds to establish up to 50 programmes where students can complete the classic two-year master studies on a part time basis master studies in 50 study areas.

⁴ See: <https://www.ft.dk/samling/20181/almdel/UFU/bilag/97/2048929/index.htm>.

Denmark has also made progress on providing migrants with training, education and jobs. A vocational programme for newly arrived migrants (new basic integration programme, IGU), agreed between the government and the social partners, started in July 2016. Access to the unemployment benefit system is granted on successful completion of the programme. Companies employing and training newly arrived migrants receive financial incentives. By April 2018, 1 440 people were enrolled in the programme, and 70-80 new contracts are being issued each month. By January 2019, the number had increased to 1 890. An evaluation of the programme published in June 2018 shows that municipalities and companies are satisfied with it and that it contributes to the competencies of migrants.

Box 2: 'STEM - the way to business competence and employment' project

Targeted guidance for pupils and parents, practice-oriented teaching and internships are some of the activities in this new project that seeks to get more young people to choose an education in the digital or technical fields. Mercantec, an educational institution in Viborg, is in charge, in partnership with other vocational schools throughout Denmark. The project is receiving DKK 43 million (EUR 5.8 million) from the European Social Fund.

The project creates targeted guidance and practice-based learning communities that will motivate more young people to take a STEM education (technology, IT, engineering, natural sciences and mathematics). At the same time, special VET classes and extension courses for talents within the STEM areas are being established. Part of the project focuses on increasing the motivation of female students to acquire STEM competencies. Unemployed adults will also have the opportunity to increase their vocational skills, helping them progress from unskilled to skilled workers.

Among other things, the project is expected to create 800 internships and, through targeted company visits, to establish internship placement guarantees in STEM areas in all regions of Denmark. The project runs from 1 January 2019 to 31 December 2021. Around 7 800 people are expected to participate.

8. Developing adult learning

There is strong participation in adult learning, but a high proportion of low-qualified adults requiring upskilling. A smaller proportion of Danish adults than the EU average (18.7% compared to 21.9%) do not have at least an upper-secondary qualification. 62.5% of low-qualified adults are in employment, 5.7 pps above the EU average (2018). Digital skills levels are high: in 2017, 75% of 16-19 year-olds reported having high-level skills (EU average: 57%). In the wider population aged 16-74, the figure is 71% (EU average: 57%). The participation rate in adult learning, 23.5%, is well above the EU average of 11.1% (2018). However there are still nearly 530 000 people aged 25-64 in Denmark who have only a low level of educational attainment. Therefore, there remains a need for upskilling, in line with the recommendation of the Council of the EU referred to in Section 4.

A national overview of adult learning opportunities has been created and ICT-based approaches to adult learning introduced. In addition to the tripartite agreement, the Ministry of Education has launched a web portal to support adults in upgrading their skills and competencies and finding the right training programme. The portal offers a national overview of adult learning opportunities to people in the labour market as well as to the unemployed. ICT-based approaches are increasingly used to fit education into the everyday life of adults. In university study programmes, changes have been introduced that increase the possibility of part-time study.

Most teachers in adult education in Denmark have formal qualifications and there are no indications of teacher shortages. In adult education, where institutions and curricula are recognised as part of the public education system, teachers face formalised qualification requirements which vary depending on the type of provision. In non-formal adult education, for instance evening schools and part of the activity of folk high schools, qualification requirements are less formalised. However, such teachers are often expected to have or to acquire the basic adult teaching certificate.

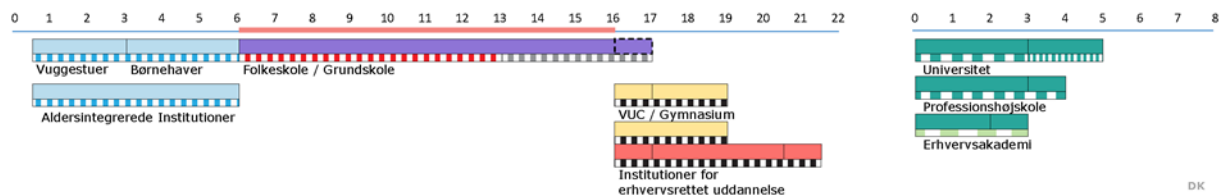
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Annex I: Key indicator sources

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	<i>JRC computation based on Eurostat / UIS / OECD data</i>
- 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.

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

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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