

# Education and Training Monitor 2025

## Comparative report



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# **Education and Training Monitor 2025**

Comparative report

This publication is based on SWD(2025)700. The 2025 Education and Training Monitor's comparative report was prepared by the European Commission's Directorate-General for Education, Youth, Sport and Culture, with contributions from the Directorate-General for Employment, Social Affairs and Inclusion. This report is accompanied by 27 country reports and an online Monitor Toolbox, with the most prominent data and sources used to analyse progress towards achieving EU-level targets. Authors are grateful for the input from the European Education and Culture Executive Agency, the Eurydice network, Eurostat, the European Commission's network of experts working on the social and economic dimension of education and training (ENESET), and the European Centre for the Development of Vocational Training (Cedefop). The Education Committee of the Council of the EU and the Standing Group on Indicators and Benchmarks (EDUC) were consulted during the drafting phase.



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## FOREWORD

The challenges we face today are immense: geopolitical and demographic shifts, economic divides, climate pressure, rapidly evolving new technologies.

We need a Europe that understands these challenges, adapts and leads the way forward, while protecting our strong European values. Our answer to these challenges needs to remain people-centred.

We need Europeans to be both well-educated and skilled, and actively engaged in society – whether it be to advance the green and digital transitions, or counter disinformation and safeguard our democracy. This begins with having our education and training systems fit for purpose.

With this vision in mind, the Commission launched the Union of Skills in March 2025. This European-wide strategy builds upon and enhances the European Education Area, aiming to provide high-quality and relevant education, training, and lifelong learning. Our goal is to prepare people for a rapidly changing society and economy. This starts by addressing the sharp decline in basic skills among our young people. We need to recognise the daily erosion of trust in our democracies due to increasing disinformation and fake news. That is why we have proposed adding citizenship as the fifth basic skill on which to focus our efforts.

The Education and Training Monitor provides in-depth analysis and reporting on the state of education and training systems, at EU and national level, and their progress towards reaching the EU-level targets set for the European Education Area. This data and evidence is crucial to identify gaps, develop evidence-based policies and monitor progress and impact in the implementation of reforms.

This year places particular emphasis on science, technology, engineering and maths (STEM) skills that are essential to strengthen Europe's competitiveness and strategic autonomy.

Data clearly shows that there is room for improvement – enrolment in STEM has stagnated in recent years and remains particularly low in information and communication technology, a vital sector for Europe's tech sovereignty. Women are still underrepresented.

To address these challenges, we need to collectively take action in the earliest years of education and continue all the way through the education pathway. The same applies to basic skills development, where too many young people and adults across the EU struggle with reading, maths, science, digital and citizenship skills.

The monitor also highlights some significant successes – early childhood education is expanding, early school leaving is declining, and higher education participation has risen across the EU. But we still see disparities based on gender and socio-economic background.

Under the Union of Skills, the STEM Education Strategic Plan and the Action Plan on Basic Skills set out concrete measures to address these challenges. The European Semester Spring Package 2025 adds to this, with targeted recommendations on education and skills for all Member States.

I warmly invite policy makers, educators, researchers and stakeholders to reflect on the valuable insights provided by this monitor. The data outlined lays the foundation for the evidence-based policymaking and strategic action we need to build the Union of Skills.

**Roxana Mînzatu**

Executive Vice-President  
Social Rights and Skills, Quality Jobs and Preparedness





## EXECUTIVE SUMMARY

The Education and Training Monitor is the European Commission's annual report on EU education and training systems, tracking their progress towards reaching the seven EU-level targets adopted as part of the 2021 Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area (EEA).

### An evolving political context

This year's edition is framed by the Union of Skills, the Commission's overarching strategy to ensure EU education and training systems drive competitiveness, prosperity, and preparedness.

The 2025 Education and Training Monitor focuses on STEM (Science, Technology, Engineering, and Mathematics). This focus responds directly to the [STEM education strategic plan](#), part of the Union of Skills, which reflects the call to address the insufficient supply of STEM talent, as highlighted in the [Draghi report](#). A sufficient pool of skilled STEM professionals is critical to safeguarding and further strengthening the EU's competitiveness, strategic autonomy, and technological leadership. As the Monitor notes, education and training systems across the EU, beginning in early childhood, play a pivotal role in ensuring a steady supply of qualified specialists.

The 2025 Education and Training Monitor also highlights the importance of basic skills, in line with the [Action Plan on Basic Skills](#), under the Union of Skills. Basic skills are essential for personal development, employability, active participation in democratic life, and for ensuring the EU's long-term prosperity and resilience.

The Education and Training Monitor comprises a comparative report, 27 country reports, and an online [Monitor Toolbox](#) with key indicators and sources.

This executive summary gives an overview of the main takeaways from the comparative report and includes country examples from the country reports.

### Building a strong STEM workforce requires boosting enrolment and tackling barriers from the earliest years, especially for girls and women

STEM specialists are essential to the EU's competitiveness, security, and technological leadership, as underlined by the STEM Education Strategic Plan, yet shortages are widespread, particularly in engineering, construction, and ICT professions. Employment rates for recent STEM graduates are among the highest across all education fields, reflecting strong demand. EU-wide projections to 2035 indicate sustained growth in STEM occupations over the next decade, in the context of the green and digital transitions, alongside significant replacement needs resulting from retirements. Compared to other advanced economies, the EU lags behind the UK and Canada in tertiary STEM graduate ratios and ranks last in ICT graduates.

Against this background, the share of students enrolled in STEM has not grown significantly in recent years. In 2023, 36.3% of medium-level vocational education and training (VET) students were enrolled in STEM fields, with significant variation and fluctuations across EU countries. STEM enrolment in tertiary education averages 26.9%, dropping



by 0.7 percentage points over the past decade. At doctoral level, nearly four in ten students are enrolled in STEM fields. However, only a small share of them (3.8%) are enrolled in ICT.

Enrolment in STEM is driven by many factors, including early school experiences, family environment and institutional factors. Data show that women are under-represented in engineering and ICT. A number of factors contribute to a lack of diversity in STEM fields, hindering the expansion of the STEM workforce, such as perceptions about STEM careers. Many EU countries have launched targeted strategies to increase the number of STEM professionals (e.g., Cyprus, Croatia, Slovenia, and Sweden). To ensure high qualifications of STEM teachers, for instance, Germany and Estonia offer micro-credential courses allowing for targeted teacher training in STEM subjects. Moreover, a number of initiatives have been launched across the EU explicitly aimed at women, such as 'STEAM Alliance for female talent' and 'ChicaSTEM' in Spain, Austria's Digital Skills Offensive and the Dutch Action Plan for Green and Digital Jobs.

### Empowering teachers is key to reversing basic skills decline

The European Commission's Action Plan on Basic Skills reinforces the basic skills framework by extending the concept of basic skills to citizenship skills. With the aim of boosting Europe's competitiveness and preparedness, the Union of Skills proposes 2030 EU-level targets for top performance in reading, mathematics and science while integrating digital skills and citizenship. A closer look at mathematics reveals drivers of recent performance drops such as digital distractions, shortages of teachers and waning parental involvement. Meanwhile, no less than 42.5% of students score below the minimum proficiency threshold in computer and information literacy, driven by inequality in access and insufficient teacher capacity.

Several EU countries have introduced measures to improve students' basic skills. Bulgaria and Czechia have updated their school curricula, Finland and Germany increased the number of hours of basic skills teaching, and Ireland, Malta, and the Netherlands have put in place targeted action plans. Belgium, Malta, and Portugal plan to hold standardised testing to improve the monitoring of students' skills. To address the challenge of teacher shortages and improve student outcomes, several EU countries have modernised their initial teacher education (e.g. France, Luxembourg), continuous professional development (e.g. Flemish Community of Belgium, Hungary, Romania), or increased salaries (e.g. Bulgaria, Lithuania, Hungary, and Slovenia). Targeted support for top-performers is not yet common, but some countries, such as Austria, Denmark, or Germany have installed mechanisms to detect and support talented students. To

increase wellbeing and to limit distractions in the classroom, more and more EU countries are recommending or adopting limitations on the use of smartphones in schools (e.g. Austria, Bulgaria, Denmark, Finland, France, Poland, and Slovenia).

### Although some disparities persist, participation in early childhood education and care keeps increasing, but its positive impact depends strongly on quality

Early childhood education and care (ECEC) participation in the EU for children aged three to the start of compulsory schooling reached 94.6% in 2023, close to the 2030 target of 96%. Eight EU countries have already met the target value, with most others exceeding 90%. This growth is attributed to policy reforms encouraging attendance and access, particularly for three-year-olds. However, participation for children under three in 2024 was 39.3% on average, with significant variations across countries. Disparities persist, notably for children at risk of poverty, especially in the 0-2 age group. In most EU countries, limited availability in the offer of ECEC places — particularly in disadvantaged areas — remains the principal obstacle to participation. On the demand side, high costs, low confidence in service quality, perceptions of insufficient standards, and limited awareness of the benefits further constrain uptake. To increase the participation of disadvantaged children, various initiatives have been put in place: Spain offers fee reductions and priority admission to ECEC facilities; Ireland set up a new support scheme 'Equal Start' that helps disadvantaged families make full use of ECEC services; Lithuania provides financial incentives at municipal level to support enrolment; and, in Portugal the 'Creche Feliz' programme has made daycare free in selected institutions.

Increasing participation in ECEC is important, but its positive impact is determined by its quality. Effective evaluation and monitoring are key to maintaining and improving that quality. While evaluations often emphasize structural quality, like compliance with health and staffing requirements, process quality such as the richness of development activities is frequently neglected, despite its considerable impact on child development. Challenges such as fragmented responsibilities and insufficient national-level data impede coherent evaluation and systemic improvement efforts. To improve ECEC quality, Malta, Poland, Portugal have introduced quality standards; and, in Estonia, childcare services and preschool education have been integrated into a single system with standardised requirements (e.g. for staff qualifications). Several EU countries are also working on other crucial aspects. For instance, Austria, Belgium, Hungary, and Latvia have recently established frameworks on ECEC staff conditions; and Czechia, France, Lithuania, Slovenia, Sweden updated their curricula.

## Tackling early school leaving and inequities requires quality, inclusive education and cross-sectoral action to help all students succeed

The share of early school leavers among 18–24-year-olds is down to 9.4%, close to the target of below 9%. Although most EU countries have achieved this target, a few experienced an increase in early school leaving between 2015 and 2024. On average, boys (10.9%) are more likely to become early school leavers than girls (7.7%). Significant rural disadvantages persist in several EU countries and students with disabilities are disproportionately affected. Newly arrived migrants are at particular risk of early school leaving, with rates of up to 28.6%. Early school leaving is a complex issue driven by interconnected factors, including socio-economic background, home and school environments, learning difficulties, limited access to relevant support, and weak student-teacher relationships. Effective strategies to combat absenteeism and disengagement require cross-sectoral, multi-targeted approaches that foster inclusive and accessible school environments, support the development of cognitive and socio-emotional skills, enhance vocational pathways, and implement early warning systems to address these diverse challenges. One example is the newly introduced Junior Master Apprenticeship in Denmark, which aims to re-engage students at risk during secondary school. In line with its Recovery and Resilience Plan, Italy has recently launched an action plan 'Agenda Sud', which aims not only to increase basic skills in southern regions but also to combat early school leaving by promoting equal opportunities across the country.

A key objective in school education is to promote equity by helping all students succeed, including those at risk of leaving school early. However, only 16.3% of students from disadvantaged socio-economic backgrounds have a good level of achievement exceeding the minimum level in reading, mathematics or science – down from 20.7% in 2018 and 21.1% in 2015. The problem is further compounded by other determinants of educational disadvantage, such as migration, refugee status, special educational needs, poor health and disability. Some EU education systems are reforming to promote equity and inclusion, with the aim of reducing the impact of socio-economic status on educational achievement. Measures of this kind require cross-sectoral cooperation. One example is reducing sorting across schools by embracing greater diversity in schools and making sure that pathways between the different tracks remain permeable. Another example is that of remedial measures, such as active inclusion policies, promoting a positive learning climate and individualised instruction (including tutoring). In Malta, individualised instruction takes the form of alternative learning pathways with adapted grading to reduce exam anxiety and reward consistent effort. In Latvia, individual learning approaches are implemented in general education institutions. Greece promotes inclusive education through the creation of school networks in vulnerable areas to address

the educational needs of communities facing economic and social challenges.

## Work-based learning increases the attractiveness of VET programmes and enhances the permeability between VET and tertiary education

Nearly two thirds (65.2%) of recent VET graduates in the EU have experienced work-based learning, which improves their employability. While the EU-level target of at least 60% by 2025 has been exceeded, a very wide dispersion across EU countries remains. Progress towards achieving the VET employability target of at least 82% by 2025 saw a minor setback, with a decrease from 80.9% in 2023 to 80.0% in 2024, part of a broader pattern of labour market slowdown. VET learners' mobility increased slightly from 5.0% to 5.3% but is not on track towards reaching the 2030 EU-level target of at least 12%. Across the EU, 70.2% of VET graduates from upper secondary education can directly access (some form of) tertiary education. While formal qualification requirements matter, they are not the only factor that influences VET learners' progression to tertiary education. Short-cycle tertiary vocational programmes have been increasing in recent years, now making up 11.9% of all VET enrolments and 7.7% of all tertiary students. In some EU countries, 'professional' bachelor's and master's programmes make up a sizeable share of overall tertiary education.

## The past decade saw a strong rise in tertiary attainment, but more action is needed to advance equity and international mobility

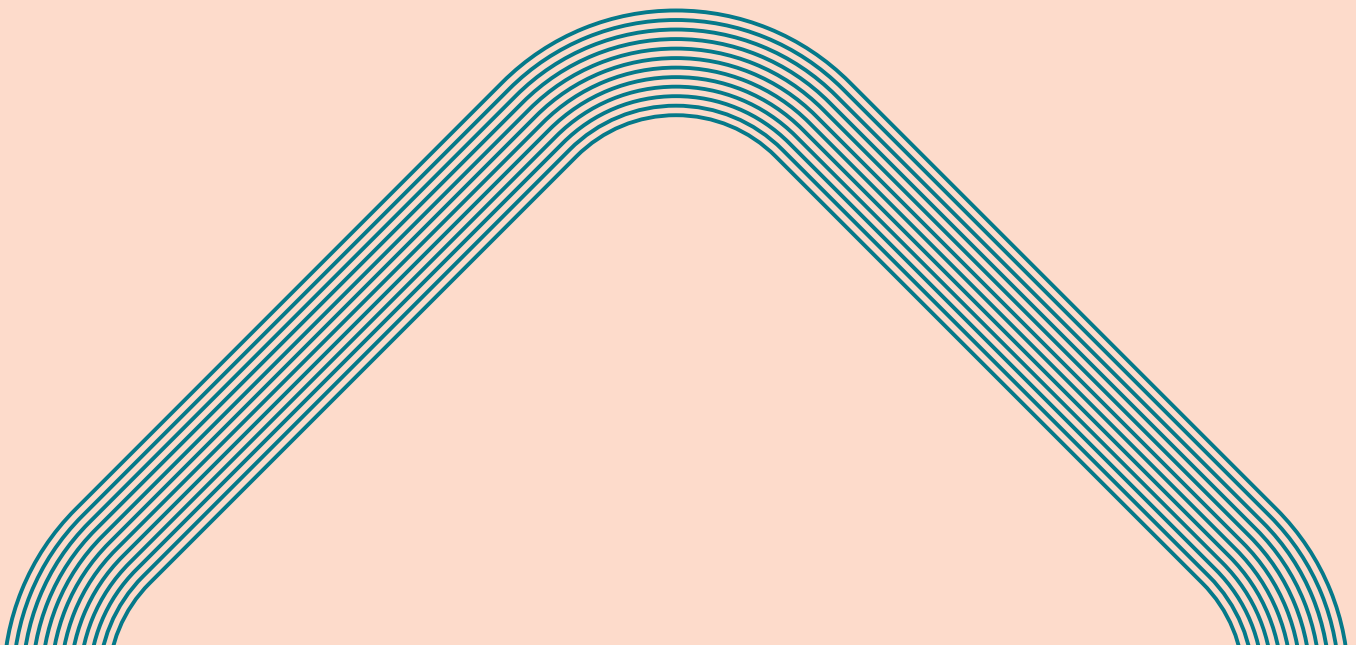
Tertiary education plays a crucial role in driving economic growth and in contributing to upward social mobility. Over the past decade, there has been a significant rise in tertiary educational attainment as a result of improved access and demand for skilled labour. The average share of 25–34-year-olds with a tertiary qualification has increased from 36.5% in 2015 to 44.1% in 2024. In ten EU countries, more than half of all 25–34-year-olds now hold a tertiary degree. However, disparities still exist by sex, country of birth, degree of urbanisation, region, disability, and parental background. Monitoring diversity in tertiary education is crucial to understanding and addressing the needs of a more varied student population and improving retention and completion rates. Flexible study options (e.g. in Slovakia) and a better validation of non-formal learning, as in the case of Spain, provide for a more equitable education system and increase the number of people with a tertiary degree entering the labour market.

Only 11.0% of the 4 million tertiary education graduates originating from EU countries are mobile, with 4.4% going abroad for a full degree and around 6.6% for credit mobility. As such, graduate outward mobility remains far from the 23% EU-level target set for 2030. Multiple data limitations

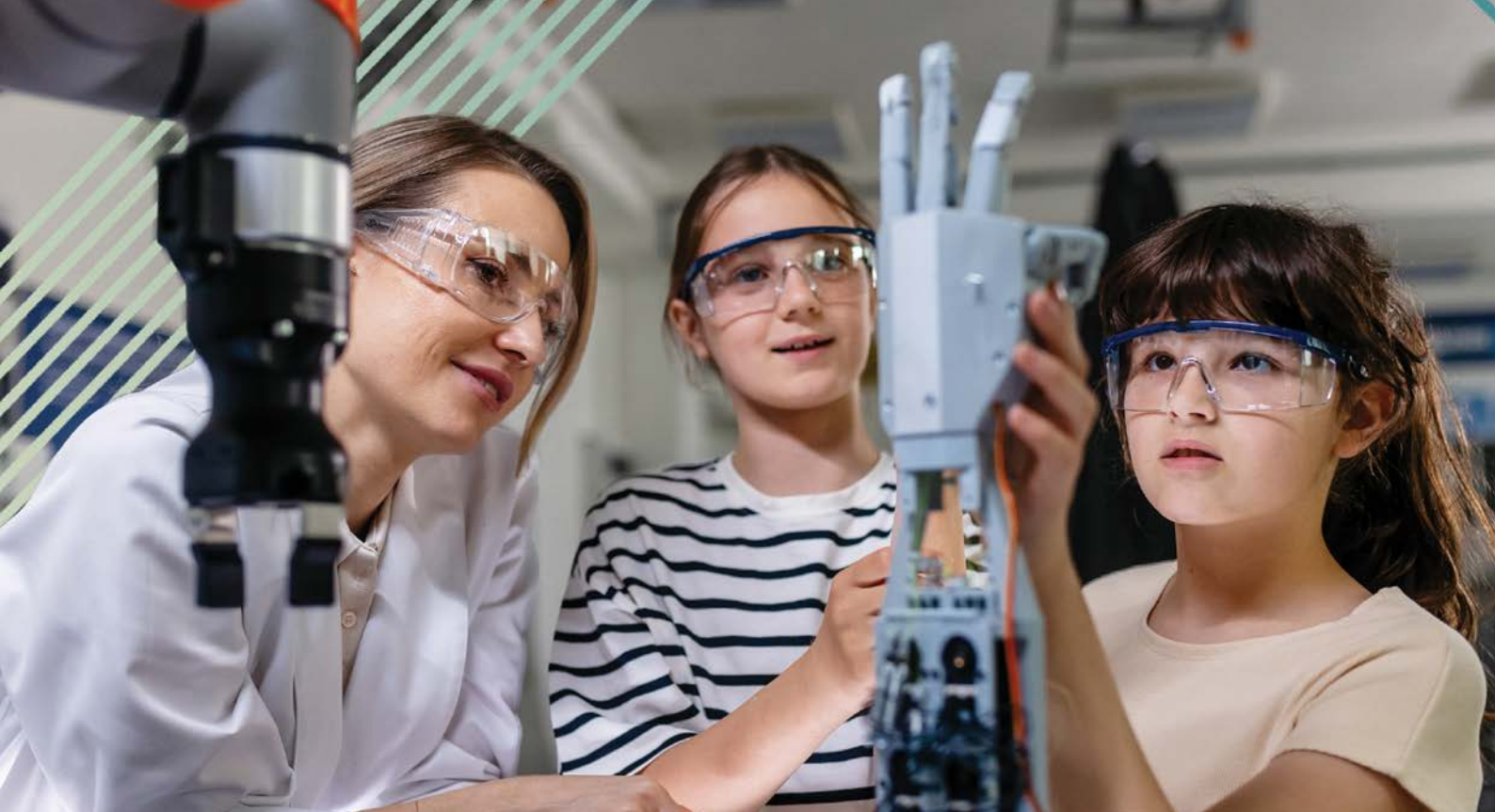
persist, however, which may lead to an underestimation of progress towards reaching the target. Meanwhile, the EU has 249 340 inward mobile tertiary graduates coming from non-EU countries, reflecting a growth of 18.2% between 2020 and 2023, and a positive trajectory towards the proposed EU-level 2030 target of 350 000. Growth is recorded at all education levels except for short-cycle programmes and across almost all countries. The highest proportion of inward mobile graduates come from Asia (37.3%), followed by Africa (26.3%), whereas relatively few come from the United States (2.8%). Some countries have recently established internationalisation strategies (e.g. Cyprus, Germany, Greece, and Poland) to increase mobility and internationalisation in higher education.

### Worrying trends in basic skills proficiency of adults calls for further improvements in participation in adult learning

The participation of adults in formal and non-formal learning reached 39.5% in 2022. While other data sources point to increases in recent years, achieving the EU-level target of 60% by 2030 will require a renewed momentum. The various data sources tracking adult learning in the last 12 months reveal consistent patterns across age, educational attainment, and employment status. Gender appears to have limited influence on overall participation rates. However, a closer look at job-related learning reveals higher rates among men, although that gap has narrowed. Basic skills form the foundation of lifelong learning. Yet, over the past decade, adult literacy proficiency has declined, numeracy skills have largely stagnated, and skill inequalities have widened. Around one in five adults (21.8%) now performs below basic proficiency in both literacy and numeracy – a substantial figure that has increased in most EU countries. Furthermore, in 2023, only 56% of people aged 16 to 74 in the EU possessed at least basic digital skills. Several countries, including Croatia, Malta, Romania, and Slovakia, have introduced measures to face the challenge of declining adult competences.







## INTRODUCTION

The Education and Training Monitor is the European Commission's annual report on EU education and training systems, tracking their progress towards reaching the seven EU-level targets adopted as part of the [2021 Council Resolution](#) on a strategic framework for European cooperation in education and training towards the European Education Area (EEA)<sup>1</sup>. It comprises this comparative report, 27 [country reports](#), which report on the reforms under way in the EU countries, and an online [Monitor Toolbox](#).

### Scope of the Education and Training Monitor

The comparative report looks at the most noticeable differences across EU countries and striking changes over time. It tracks the progress towards reaching the seven EU-level targets and complements them with numerous supporting indicators to shed light on the context and possible policy levers. It presents and analyses evidence and reports on research findings, with a view of informing and supporting EU and national policy making.

|                                       |                                                                                                                                                                        |           |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| EU-level targets connected to the EEA | 'At least 96% of children between 3 years old and the starting age for compulsory primary education should participate in early childhood education and care by 2030.' | Chapter 3 |
|                                       | 'The share of early leavers from education and training should be less than 9% by 2030.'                                                                               | Chapter 4 |
|                                       | 'The share of underachievement in reading, mathematics, and science should be less than 15% by 2030.'                                                                  | Chapter 2 |
|                                       | 'The share of eighth graders' underachievement in computer and information literacy should be less than 15% by 2030.'                                                  | Chapter 2 |
|                                       | 'At least 60% of recent VET graduates should have experienced work-based learning as part of their VET programme by 2025.'                                             | Chapter 5 |
|                                       | 'The share of 25-34-year-olds with tertiary educational attainment should be at least 45% by 2030.'                                                                    | Chapter 6 |
|                                       | 'At least 47% of adults aged 25-64 should have participated in learning during the last 12 months by 2025.'                                                            | Chapter 7 |

1 Referred to in the remainder of this report as the 2021 EEA strategic framework Resolution.

In addition, the Monitor refers to other EU-level targets tracked by the European Commission in the areas of formal childcare, vocational education and training, learning mobility,

and adult learning. This connects the Education and Training Monitor to other work strands, such as the European Pillar of Social Rights Action Plan and Europe on the Move.

|                        |                                                                                                                                                                      |           |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Other EU-level targets | 'At least 45% of children below the age of 3 participate in formal childcare, with specific targets applying to EU countries that have yet to reach the 2002 goals.' | Chapter 3 |
|                        | 'The share of employed graduates from VET should be at least 82% by 2025.'                                                                                           | Chapter 5 |
|                        | 'In VET, the share of vocational learners who do part of their studies abroad should be at least 12% by 2030.'                                                       | Chapter 5 |
|                        | 'The share of tertiary graduates with a learning mobility experience abroad should be at least 23% by 2030.'                                                         | Chapter 6 |
|                        | 'At least 60% of adults aged 25-64 should have participated in learning during the last 12 months by 2030.'                                                          | Chapter 7 |

## The Education and Training Monitor in a new political context

This year's edition is anchored in the Union of Skills, the overarching strategy that translates the political ambition of this Commission's mandate into concrete actions, ensuring that EU education and training systems are key enablers of the EU's competitiveness, prosperity, preparedness and security. This strategy complements and reinforces the [Competitiveness Compass](#), the [Clean Industrial Deal](#), and the [Preparedness Union Strategy](#), highlighting the central role of

education and skills in addressing the EU's main challenges and in delivering on its political objectives.

The 2025 Education and Training Monitor has been prepared in this political context. It takes into account the new set of education and skills targets for 2030 proposed in the [2025 Union of Skills Communication](#) of March 2025. These targets reflect emerging education and skills priorities, linked to economic priorities. In particular, the Communication proposes targets in the areas of STEM, top performance and international attractiveness, as presented in detail in the table below.

|                                         |                                                                                                                                                                                                                           |           |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Proposed targets in the Union of Skills | 'By 2030, the share of students enrolled in STEM fields in initial medium-level VET should be at least 45%, and at least 1 out of every 4 students enrolled in STEM fields in initial medium-level VET should be female.' | Chapter 1 |
|                                         | 'By 2030, the share of students enrolled in STEM fields in tertiary education should be at least 32%, and at least 2 out of every 5 students enrolled in STEM fields in tertiary education should be female.'             | Chapter 1 |
|                                         | 'By 2030, the share of students enrolled in ICT PhD programmes should be at least 5%, at least 1 out of every 3 students enrolled in ICT PhD programmes should be female.'                                                | Chapter 1 |
|                                         | 'By 2030, the share of top performance in reading, mathematics and science should be at least 15%.'                                                                                                                       | Chapter 2 |
|                                         | 'By 2030, the annual number of learners from outside the EU coming to study and obtain a degree at tertiary level in the EU should be at least 350 000'                                                                   | Chapter 6 |

## Reorganisation of EU education and training targets

In June, the [interim evaluation of the 2021-2030 European Education Area Strategic Framework](#) confirmed that EU-level targets have been effective in focusing and tracking reforms as well as in informing EU-level cooperation and mutual learning.

On this basis, the Commission suggested a reorganisation of the proposed and existing targets into thematic and sectoral targets<sup>2</sup>, in order to strengthen their added value and advance on strategic priorities. The sectoral group includes

the targets adopted in the 2021 EEA Strategic framework Resolution, except those on underachievement in basic skills (included in the thematic group) and the adult learning target, as adopted in the [2021 on Council Conclusions on a new European agenda for adult learning 2021-2030](#). The targets proposed in the Union of Skills have been included in the thematic group.

The interim evaluation further suggests adding two additional thematic targets<sup>3</sup>: one on civic education and one on equity. The equity target would respond directly to the Council's request, set out in the 2021 EEA strategic framework Resolution<sup>4</sup>, to develop indicators or EU-level

<sup>2</sup> See the [Annex](#) for a detailed overview.

<sup>3</sup> In addition, the European Commission also suggests more ambitious target values for the sectoral targets in early school leaving and tertiary education attainment in the interim evaluation.

<sup>4</sup> The analysis conducted by the European Commission in response to the 2021 Council Resolution and with the support of the SGIB (Standing Group on Indicators and Benchmarks), concluded that: a set of indicators rather than a single one is better suited to monitoring the challenges and progress of the teaching profession and in the area of learning for sustainability; and that a possible target on equity could be suggested.

targets in this policy priority area. A target on civic education would be consistent with the [2023 Council conclusions](#) on the contribution of education and training to strengthening common European values and democratic citizenship. These Conclusions invited Member States and the European

Commission to consider incorporating democratic citizenship in the second (2026-2030) cycle of the strategic framework for European Education Area. They also called for citizenship education to be integrated into the existing monitoring processes of education and training system.

|                   |                                                                                                                                                                                         |           |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Suggested targets | 'By 2030, the share of adequate performance in civic knowledge should be at least 85%.'                                                                                                 | Chapter 2 |
|                   | 'By 2030, the share of learners from disadvantaged socio-economic backgrounds with a good achievement in at least one domain (reading, mathematics or science) should be at least 25%.' | Chapter 4 |

Reporting on these proposed and suggested targets in addition to the existing ones, the 2025 Education and Training Monitor informs the Council's ongoing reflections on the review of the strategic framework for European cooperation in education and training, without prejudice to any conclusions to be drawn by the Council.

### Focus and structure of the 2025 report

Each annual edition of the Monitor has a specific thematic focus, such as inclusion and equity (2022), the teaching profession (2023) and learning for sustainability (2024). This year's thematic focus is on STEM. It is a direct response to the [STEM education strategic plan](#), part of the Union of Skills, which aims to increase the number of STEM specialists in the EU labour market and improve STEM skills, against a background of labour and skills shortages in the field. A strong STEM workforce is essential to sustain EU competitiveness, preparedness, and technological leadership. The Monitor shows that EU education and training systems can play a crucial role in strengthening interest in STEM fields from early years and supply of STEM specialists.

The 2025 Education and Training Monitor also gives prominence to basic skills, including digital skills and citizenship skills, following the [Action Plan on Basic Skills](#), another key initiative of the Union of Skills. Basic skills are vital for every single person to develop as an individual, to navigate the complexities of everyday life and a rapidly changing job market, and to participate fully in society, democratic life and the economy. Strong basic skills also underpin EU's prosperity and resilience. With its analysis and findings, the 2025 Education and Training Monitor supports the EU's latest political ambitions and initiatives in education and skills.

This comparative report has seven chapters. Chapter 1 focuses on STEM, with an analysis of STEM enrolment in VET and tertiary education. Chapters 2 deals with the basic skills of young people<sup>5</sup>. Chapter 3 to 7 cover the EU-level target areas from early childhood education and care all the way through adult learning. The 2025 Education and Training

Monitor's comparative report and country reports are backed up by the online [Monitor Toolbox](#), with all key sources and data organised by country and theme.

The comparative report features contributions from the European Education and Culture Executive Agency (EACEA), the Eurydice network, Eurostat, Cedefop and the European Commission's network of experts working on the social and economic dimension of education and training (ENESET). The Education Committee of the Council of the EU, and the Standing Group on Indicators and Benchmarks (SGIB)<sup>6</sup> were consulted during the drafting phase.

<sup>5</sup> Evidence on basic skills of adult people is presented in [Chapter 7](#).

<sup>6</sup> The SGIB is an informal expert group advising the European Commission on evidence and monitoring of education and training systems within the Open Method of Coordination.







## CHAPTER 1. STEM

Fostering competitiveness, advancing technological leadership, and strengthening security and strategic autonomy in a volatile geopolitical context are key priorities for the EU. STEM, encompassing Science, Technology, Engineering, and Mathematics<sup>7</sup>, plays a crucial role in achieving these goals. In the coming years, the EU aims to increase investments in artificial intelligence and advanced data analytics, renewable energy technologies, biotechnology, and meet its defence and security needs. Addressing current shortages in STEM fields and ensuring a stronger supply of STEM specialists that supports these ambitions is therefore crucial<sup>8</sup>. While vocational education and training (VET) and tertiary education are critical to building a solid supply of STEM talents, early experiences at school also play a role. To this end, the European Commission adopted the [STEM Education Strategic Plan](#) as part of the [Union of Skills](#). This chapter provides the state-of-play with regard to the current demand and supply of STEM professionals and enrolment in

STEM programmes, and dive into key issues such as gender differences in STEM and drivers of study choices.

### 1.1. Demand and supply of STEM professionals

Amid imbalances between supply and demand in EU labour markets<sup>9</sup>, STEM faces one of the most widespread labour shortages<sup>10</sup> in the EU<sup>11</sup>. Although there is a lack of harmonised demand-side indicators, the bulk of shortage occupations<sup>12</sup> in STEM fields concerns crafts, construction and engineering. Among the top shortage occupations, several engineering professions feature consistently, including industry and production, electrical and civil engineering. Widespread shortages are also observed in ICT-related occupations, such as administrators and software developers, and application programmers.

7 The acronym STEM was coined in the 1990s by the National Science Foundation in the US referring to the individual areas of science, technology, engineering and mathematics. This Chapter includes among the STEM fields: 'natural sciences, mathematics and statistics', 'information and communication technologies' and 'engineering, manufacturing and construction' in STEM, as defined in the [2013 UNESCO classification of fields of education](#).

8 For more information, see [the 2024 Draghi report on the future of European competitiveness](#).

9 See the 2025 [EURES Report on labour shortages and surpluses 2024](#).

10 This chapter focuses on STEM labour shortages: quantitative shortages of individuals with a STEM qualification needed to fill available jobs in the economy. It does not refer to STEM skills gaps, a deficiency of STEM-related competences across the wider workforce, including people with a non-STEM degree. Furthermore, employers' difficulties in finding people with the right skills are not only due to a lack of qualifications or skills among job applicants but also to an inability to attract and retain workers, whether because of poor working conditions, human resource management, or demographic developments. Particularly in crafts occupations in the construction sector, unmet demand for labour may be linked to (perceived) working conditions. See the 2024 [EURES Report on labour shortages and surpluses in Europe 2023](#).

11 As reported in the [2024 ELA EURES report](#) on labour shortages and surpluses. Besides STEM, shortages have been recorded in healthcare, construction, and hospitality for many years. As shortages in all sectors are a barrier to productivity growth and innovation, the Union of Skills also envisages to strengthen their analysis through a new platform, the European Skills Intelligence Observatory.

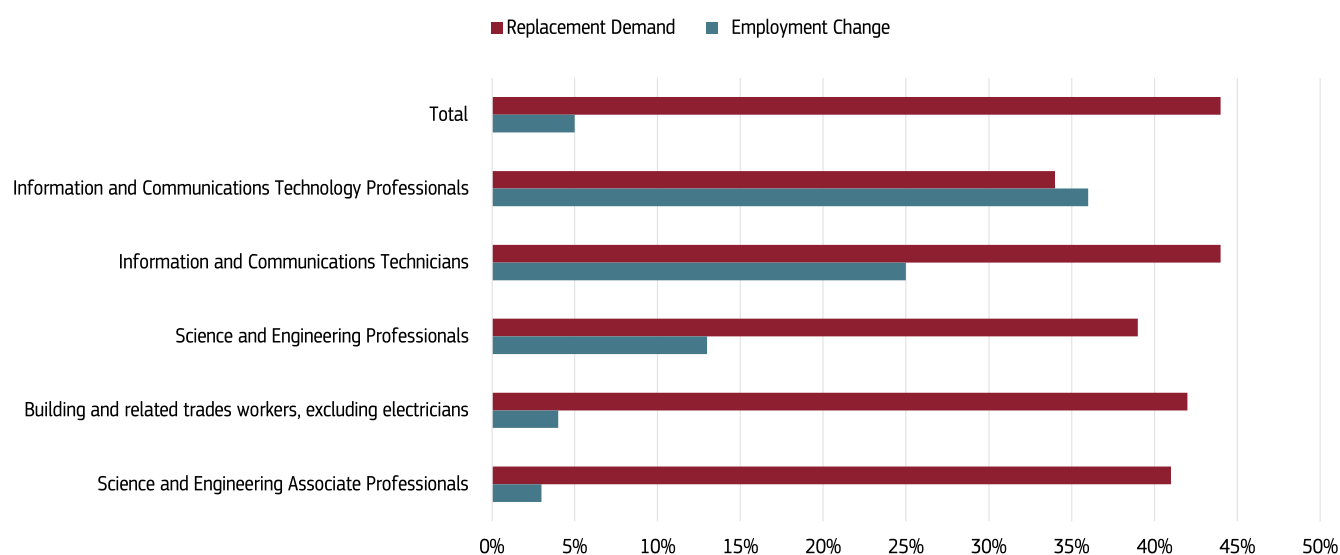
12 For occupations where there are surpluses, there is less consistency between EU countries, with fewer of those surpluses relating to STEM fields. For example, nine countries have reported a surplus of construction workers. The potential for cross-border matching of shortages and surpluses in STEM is limited and primarily applicable to construction workers.

High employment rates among recent STEM tertiary graduates across the EU (89.6%) also reflect the strong demand for STEM professionals<sup>13</sup>. Across all education fields, the highest rates are recorded for graduates from engineering, manufacturing and construction (91.2%), followed by ICT (88.6%)<sup>14</sup>. Similarly, in medium-level VET<sup>15</sup>, recent graduates from STEM fields have a slightly higher employment rate (81.6%) than the average VET graduate (80.3%). VET graduates in manufacturing, construction and engineering (82.4%) are more likely to be employed than recent VET graduates in ICT (77.1%)<sup>16</sup>.

Looking ahead, Cedefop's skills forecasts indicate substantial future demand for STEM occupations. In the next decade, overall employment is forecast to grow<sup>17</sup> from 213,8 million

workers in 2022 to 224,5 million in 2035 in the EU. While employment in certain occupations (notably clerical workers and agricultural workers) is expected to decrease, there will be a strong growth particularly in some high-skilled STEM occupations, including ICT professionals and Science and engineering professionals (Figure 1). In particular, between 2022 and 2035, the total number of ICT professionals is expected to increase by 36%. The digital and green transitions will contribute to employment growth<sup>18</sup>. Beyond employment growth<sup>19</sup>, a large share of future job openings will result from replacement needs as workers leave the labour market, mainly through retirement. By 2035, for example, an estimated 34% of ICT professionals will need to be replaced. Meeting this demand will require a steady inflow of newly recruited and trained staff to sustain the STEM workforce.

**Figure 1. Overall forecast employment change and replacement demand. Total and selected STEM occupations, 2022-2035**



Source: Cedefop Skills forecast calculations. [Download data](#) [Monitor Toolbox](#)

Note: 'Employment change' indicates the expected change of employment needs linked to expansion of economic activity in given sectors and occupation from 2022 to 2035; 'Replacement demand' looks at job opening arising from people leaving an occupation by 2035, mainly due to retirement, as a share of employment in 2022. For the definitions of occupation category, see the [International Standard Classification of Occupations \(ISCO\)](#). Occupations are defined at ISCO 2-digit level.

<sup>13</sup> This concerns graduates from tertiary education, having graduated 1 to 3 years earlier (2024 figures). [Monitor Toolbox](#)

<sup>14</sup> In contrast, for graduates from natural sciences, mathematics and statistics, the employment rate (86.3%) is slightly below the average for tertiary education across all fields (86.7%). [Monitor Toolbox](#)

<sup>15</sup> Vocational education and training programmes at upper secondary and post-secondary non-tertiary levels.

<sup>16</sup> This concerns VET graduates, having graduated 1 to 3 years earlier (2024 figures). The field 'natural sciences, mathematics and statistics' in VET is too small to calculate reliable employment rates for recent graduates. [Monitor Toolbox](#)

<sup>17</sup> For further information, see a [2023 Cedefop report](#).

<sup>18</sup> For more information, see Cedefop analysis in the [2023 European Commission report](#) on employment and social developments in Europe.

<sup>19</sup> Beyond the size of future employment, the intensity of demand matters as well. In some professions, a relatively small number of workers plays a crucial role in promoting innovation and taking up new technologies. These include some STEM occupations, such as highly specialised engineers and medium-skilled technical profiles, who play a vital role in installing and maintaining critical infrastructure. For more information, see a [2024 Cedefop technical report](#).

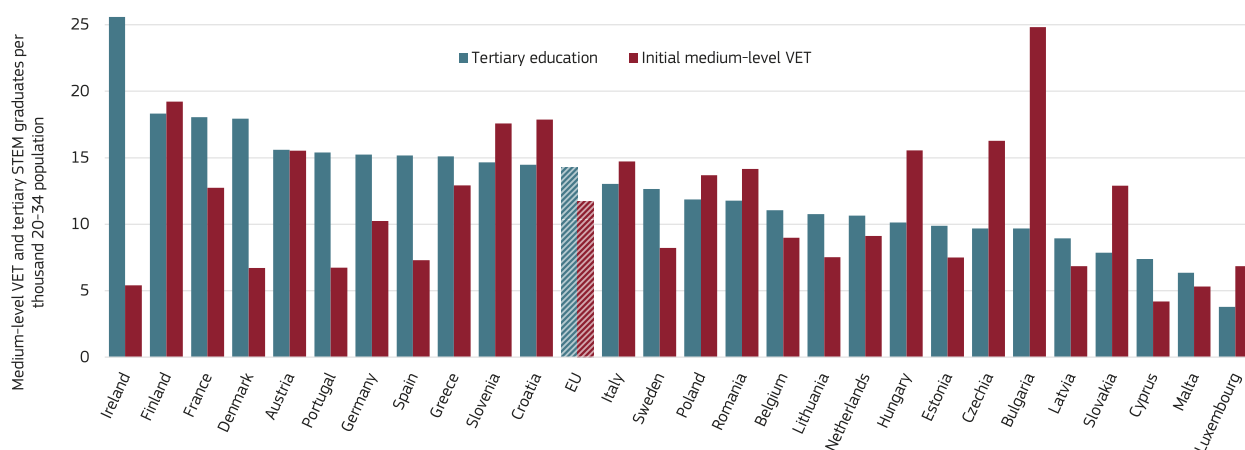


Together, these trends confirm that demand for STEM specialists is both high and set to increase, especially in engineering and ICT, whereas labour market pressure on science and mathematics professions appears less pronounced.

On the supply side, 27.2%<sup>20</sup> of the EU's adult population (25-64) holds a tertiary STEM qualification, a share that has remained stable since 2021. Expanding the STEM workforce relies primarily on the steady inflow of tertiary and medium-level VET graduates<sup>21</sup>. Among the younger population, the

number of STEM tertiary graduates per thousand young people, is 14.3 per 1 000 20-34-year-olds at EU level<sup>22</sup>. However, this ratio varies considerably: eight EU countries<sup>23</sup> have a ratio lower than 10.0, while France, Finland and Ireland record a ratio higher than 18.0. In medium-level VET, there are 11.8 graduates in STEM fields per 1 000 young people, ranging from 4.2 in Cyprus to 24.8 in Bulgaria. The number of STEM graduates is likely shaped by a country's economic structure, as skill intensity varies across sectors and, within industry, across EU countries.<sup>24</sup>

Figure 2. The EU faces uneven distribution of STEM graduates amid growing demand



Source: Eurostat (UOE joint data collection 2023). [Download data](#) [Monitor Toolbox](#)

Note: Data for France are provisional, for Poland are estimated and provisional, and for Romania are estimated. Countries are shown in descending order based on the ratio for tertiary graduates.

Unlike tertiary education, where the ratio has risen steadily<sup>25</sup> from 12.0 in 2015 to 14.3 in 2023, trends in VET have been less consistent, showing growth since 2015<sup>26</sup> but with fluctuations<sup>27</sup>. Despite this gradual increase, STEM shortages persist, underscoring the need to further expand the number of STEM specialists, particularly in engineering and ICT, through higher enrolments in medium-level VET and in higher education (see [Section 1.2](#)). The European Skills Intelligence Observatory, under the Union of Skills, will provide data and evidence about current and future shortages to better align supply with labour demand.

When compared with other large, advanced economies<sup>28</sup>, the EU has the second-lowest ratio of STEM tertiary graduates per 1 000 young people (14.3), above the US (13.1) but below the UK (17.9) and Canada (15.6). The comparison is even less favourable in the case of ICT. With a ratio of 2.6 ICT tertiary graduates per 1 000 young people, the EU ranks at the bottom of the distribution, while the UK is the best-performing country in this respect (4.6)<sup>29</sup>.

20 2024 figures. Data on people holding a STEM medium-level qualification are not available. [Monitor Toolbox](#)

21 STEM workforce expansion is also supported by professionals transitioning into STEM roles through reskilling and upskilling. Further insights on the role of adult learning are provided in [Chapter 7](#).

22 2023 figures. [Monitor Toolbox](#)

23 Luxembourg, Malta, Cyprus, Slovakia, Latvia, Bulgaria, Czechia and Estonia.

24 See a [2020 European Commission report](#) on sectoral differences in skill-intensity, including digital skills.

25 The ratio decreased 0.3 between 2017 and 2018.

26 10.3 in 2015.

27 The number of VET STEM graduates shows a similar trend.

28 The comparison is based on the UNESCO/OECD/Eurostat (UOE) joint data collection (2023 figures). Japan, the only other non-EU G7 economy, is excluded because data on ICT tertiary graduates are not available. Comparable data for China are not available. The comparison does not cover initial-medium VET due to a lack of comparable data at this level of education.

29 The US comes in at (3.7) and Canada at (3.9). [Monitor Toolbox](#)

Amid the growing demand for STEM professionals, the [STEM Education Strategic Plan](#) therefore turns the focus to improving the enrolment figures across the EU to increase STEM supply in the near future. A lack of STEM professionals would put the EU at risk of falling behind in the global technology race, notably in strategic sectors such as clean and circular technologies, digital technologies, aerospace, and defence.

### Main takeaway

STEM specialists are essential to the EU's competitiveness, security, and technological leadership, as underlined by the STEM Education Strategic Plan, yet shortages are widespread, particularly in engineering, construction, and ICT professions. Employment rates for recent STEM graduates are among the highest across all education fields, reflecting strong demand. EU-wide projections to 2035 indicate sustained growth in STEM occupations over the next decade, in the context of the green and digital transitions, alongside significant replacement needs resulting from retirements. Compared to other advanced economies, the EU lags behind the UK and Canada in tertiary STEM graduate ratios and ranks last in ICT graduates.

## 1.2. Enrolment in STEM

### 1.2.1. Current trends



Proposed EU-level 2030 target<sup>30</sup>:  
**'By 2030, the share of students enrolled in STEM fields in initial medium-level VET should be at least 45%.'**



Proposed EU-level 2030 target<sup>31</sup>:  
**'By 2030, the share of students enrolled in STEM fields in tertiary education should be at least 32%.'**



Proposed EU-level 2030 target<sup>32</sup>:  
**'By 2030, the share of students enrolled in ICT PhD programmes should be at least 5%.'**

In medium-level VET, 36.3% of all students across the EU are enrolled in STEM programmes (Figure 3)<sup>33</sup>. The rate is 2.3 percentage points higher than in 2015 but 8.7 percentage points below the proposed 2030 EU-level target<sup>34</sup> of at least 45%. In recent years, the share of STEM enrolment in VET has fluctuated around 36%<sup>35</sup>, ranging from 19.0% in the Netherlands to 59.8% in Cyprus. Six<sup>36</sup> EU countries currently exceed the proposed EU target of at least 45% by 2030. Engineering, manufacturing and construction is the largest STEM subfield in VET, not just across the EU on average<sup>37</sup> but in almost all EU countries<sup>38</sup>.

30 Proposed in the [STEM education strategic plan](#), part of the [Union of Skills](#).

31 Proposed in the [STEM education strategic plan](#), part of the [Union of Skills](#).

32 Proposed in the [STEM education strategic plan](#), part of the [Union of Skills](#).

33 2023 Figures. [Monitor Toolbox](#)

34 Although people with STEM qualifications or STEM graduates, are a better indicator of the STEM supply, as they have completed a STEM programme, the Union of Skills' target proposal for 2030 refers to enrolment, i.e. students who are attending a STEM programme (and might not graduate). This was decided because it takes longer to observe changes in the proportion of people with a STEM qualification or in the number of STEM graduates, as enrolled students need to complete their degrees. In contrast, enrolment data can show changes in response to recent policy changes. This makes enrolment a better indicator for a target proposed in 2025 for 2030.

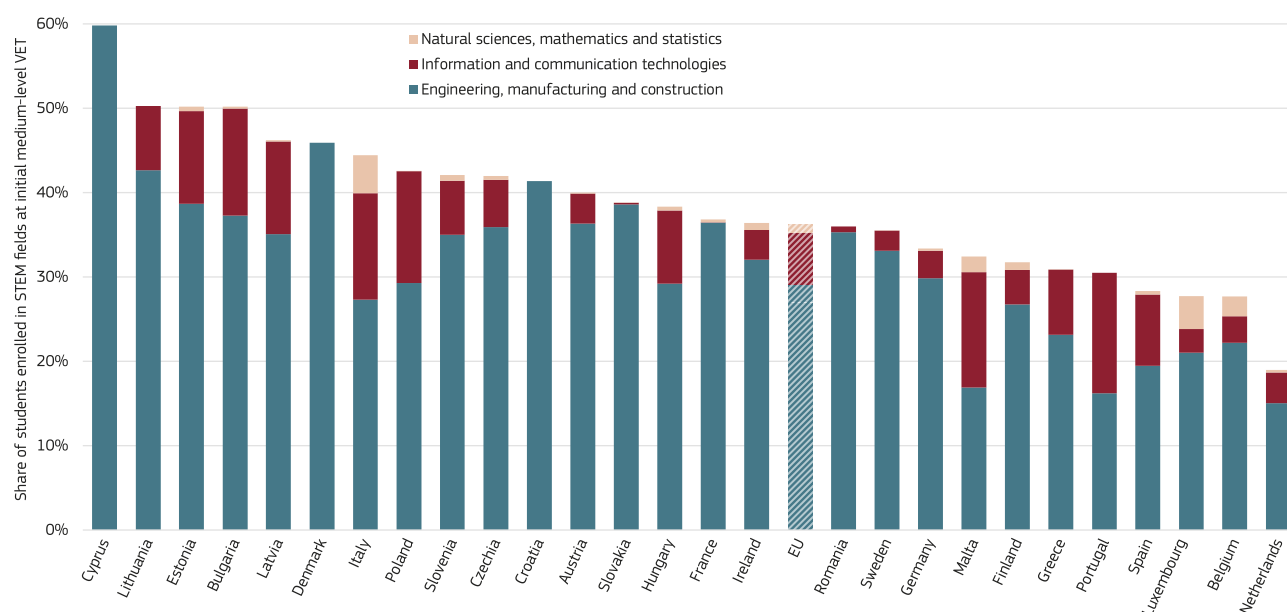
35 The rate was 36.1% in 2020, 36.6% in 2021, 35.8% in 2022 and 36.3% in 2023.

36 Denmark (45.9%), Latvia (46.2%), Bulgaria (50.2%), Estonia (50.2%), Lithuania (50.3%), and Cyprus (59.8%). [Monitor Toolbox](#)

37 In 2023, 29.1% of medium-level VET students were enrolled in 'engineering, manufacturing, and construction', 6.2% in 'ICT' and only 1.0% in 'natural sciences, mathematics and statistics'. [Monitor Toolbox](#)

38 There are few VET students in 'natural sciences, mathematics and statistics', which is arguably the least 'applied' STEM field. The size of medium-level VET in ICT varies considerably across EU countries, from none in some Member States to more than one in ten VET pupils in Bulgaria, Estonia, Italy, Latvia, Malta, Poland and Portugal. [Monitor Toolbox](#)

Figure 3. **Most VET students in STEM are in engineering, manufacturing and construction**



Source: Eurostat (UOE joint data collection 2023). [Download data](#) [Monitor Toolbox](#)

Note: Share of students in medium-level VET (upper secondary or post-secondary non-tertiary education, with a vocational orientation) enrolled in STEM fields by narrow field. Definition differs for data in Czechia and the Netherlands. Countries are shown in descending order based on the total share of STEM graduates.

However, these figures should be analysed in the context of overall VET enrolment at medium-level, which varies considerably across the EU<sup>39</sup>. The VET sector in Cyprus, for example is strongly focused on STEM fields (59.8%), but very small in overall size in relation to the country's total medium level education (17.9%). The Netherlands, on the other hand, has one of the largest VET sectors in the EU (69.6% of students in medium-level education), but only a small proportion of these VET students is enrolled in STEM fields (19.1%). Countries that have both a sizeable VET sector overall, and considerable share of STEM within this sector, include Czechia, Bulgaria, Austria, Slovenia, Croatia, Slovakia, and Poland. In these countries, more than one out of four students in medium-level education overall attends VET programmes in STEM fields.

In tertiary education, 26.9% of students are enrolled in STEM fields, 5.1 percentage points below the proposed 2030 EU-level target of at least 32% (Figure 4)<sup>40</sup>. The share of STEM students varies from 13.9% in Malta to 35.5% in Germany. Apart from Germany, also Finland (35.3%) and Greece (33.7%) have already reached the EU-level target value, while 12 countries<sup>41</sup> have yet to reach 25%. More than half (54.6%) of all tertiary STEM students are enrolled in 'engineering, manufacturing and construction', compared to 25.1% in 'natural sciences, mathematics and statistics', and 20.3% in ICT. However, this distribution varies considerably between EU countries, especially when it comes to the last two STEM subfields<sup>42</sup>. For instance, the share of students enrolled in tertiary ICT programmes ranges from 8.8% in Italy to 37.7% in Luxembourg.

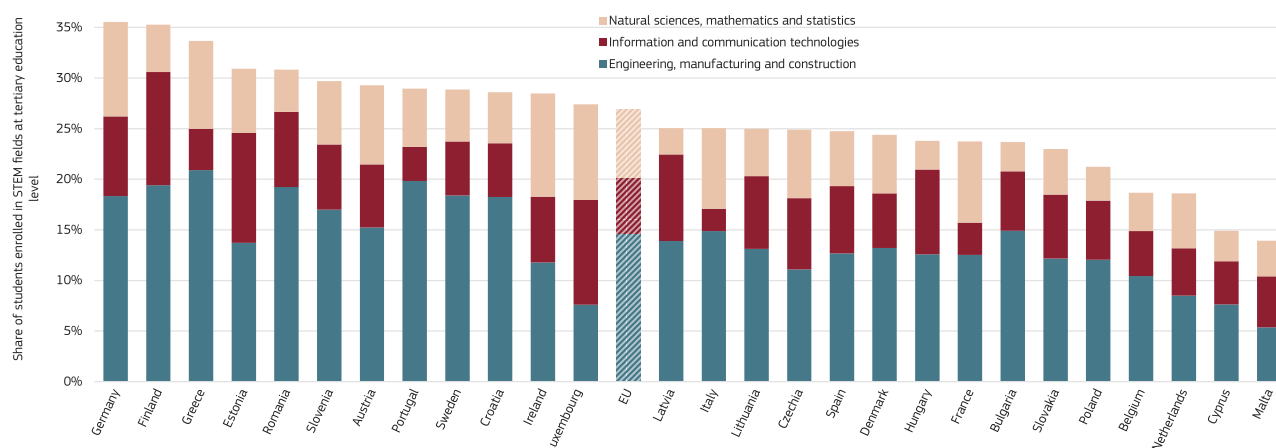
<sup>39</sup> At EU level, 52.4% of medium-level students are enrolled in VET programmes. [Monitor Toolbox](#)

<sup>40</sup> In fact, the three STEM fields taken together attract the highest shares of tertiary students. The field of 'business, administration and law' attracts the highest number of tertiary students (22.0%), followed by 'engineering, manufacturing and construction' (14.7%). These are 2023 figures. [Monitor Toolbox](#)

<sup>41</sup> Malta (13.9%), Cyprus (14.9%), Belgium (18.7%), the Netherlands (18.6%), Poland (21.2%), Slovakia (23.0%), Bulgaria (23.7%), France (23.7%), Hungary (23.8%), Denmark (24.4%), Spain (24.7%) and Czechia (24.9%). [Monitor Toolbox](#)

<sup>42</sup> Engineering is the most common STEM field in all EU countries except Luxembourg (27.7%), Malta (38.4%), Ireland (41.4%), Estonia (44.3%), Czechia (44.6%) and the Netherlands (45.6%).

Figure 4. More than one in four tertiary students are enrolled in STEM fields



Source: Eurostat (UOE joint data collection 2023). [Download data](#) [Monitor Toolbox](#)

Note: Definition differs for data in France. Countries are shown in descending order based on the total share of STEM graduates.

The EU average has decreased by 0.7 percentage points during the last decade<sup>43</sup>. 13 EU countries<sup>44</sup> recorded a decrease in the share of STEM enrolment at tertiary level – greater than 5 percentage points in Poland (-5.6) and in Malta (-7.6)<sup>45</sup>, suggesting a possible drop in interest among students in STEM compared to other fields. Public interest in STEM fields and awareness of shortages of STEM specialists has not yet translated into higher number of students; the share of STEM enrolment at tertiary level even dropped 0.2 percentage points between 2022 and 2023, suggesting a need for improving attractiveness of STEM fields among students.

At doctorate level, nearly four in ten (39.9%) students are enrolled in STEM fields<sup>46</sup>. One in five (20.1%) doctorate students is enrolled in ‘natural sciences, mathematics, and statistics’ and 16.0% in ‘engineering, manufacturing and construction’. However, only a small share (3.8%) is enrolled in ICT<sup>47</sup>. This rate is 1.2 percentage point below the proposed 2030 EU-level target of at least 5%. It increased by 0.5 percentage points between 2015 and 2023. In absolute terms, the number of doctorate students enrolled in ICT increased by 32.4% during that period. This rise was much higher than for the other two STEM fields<sup>48</sup>. The share of doctoral students enrolled in ICT is below 2% in Belgium, Croatia and Malta while exceeding 10% in Luxembourg, (23.1%) and Estonia (10.9%). Figure 5 shows that only four other countries<sup>49</sup> have reached the value proposed for the EU-level target.

43 These shares may mask relevant changes in the absolute numbers. On average, the absolute number of enrolled STEM tertiary students rose by 6.4% between 2015 and 2023, (from 4,759,669 to 5,063,696), whereas the total number of enrolled students in tertiary education rose by 9.3% (from 17,215,035 to 18,822,775), signalling a lower interest in STEM fields. A similar trend is visible in Malta, Cyprus, France, Germany, Spain, Portugal and Greece. In contrast, in Luxembourg, Denmark, Belgium, Ireland, Croatia, Finland, Sweden and Austria, the enrolment in STEM increased more than the total number of students, indicating that the higher participation in tertiary education benefitted STEM. On the other hand, Estonia, Latvia and Lithuania, recorded a marked decrease in enrolment at tertiary level, accompanied by a lower decline in STEM. The contrary happened in Bulgaria, Czechia, Hungary, Poland and Romania, Slovenia and Slovakia, where the decline in STEM was higher. Croatia, by contrast, experienced a decline in the total enrolment and an increase in STEM enrolment. [Monitor Toolbox](#)

44 Malta (-7.6 percentage points), Poland (-5.6), Cyprus (-3.4), Romania (-2.3), Germany (-2.2), Hungary (-2.1), France (-1.6), Czechia (-1.4), Spain (-1.2), Portugal (-1.0), Bulgaria (-0.6), Greece (-0.6) and Slovakia (-0.01). [Monitor Toolbox](#)

45 The absolute number of STEM enrolled students rose in Malta by 3.5%. However, the number of enrolments increased much more, by 59.8%. In Poland, the number of students enrolled in STEM declined more than the total number of enrolled students (-35.6% versus -18.6%).

46 The field of ‘health and welfare’ attracts the highest number of doctoral students with 21.0%, followed by ‘natural sciences, mathematics, and statistics’. These are 2023 figures. It is worth noting that the proposed 2030 EU-level target on STEM enrolment at tertiary level incorporates the doctoral level. [Monitor Toolbox](#)

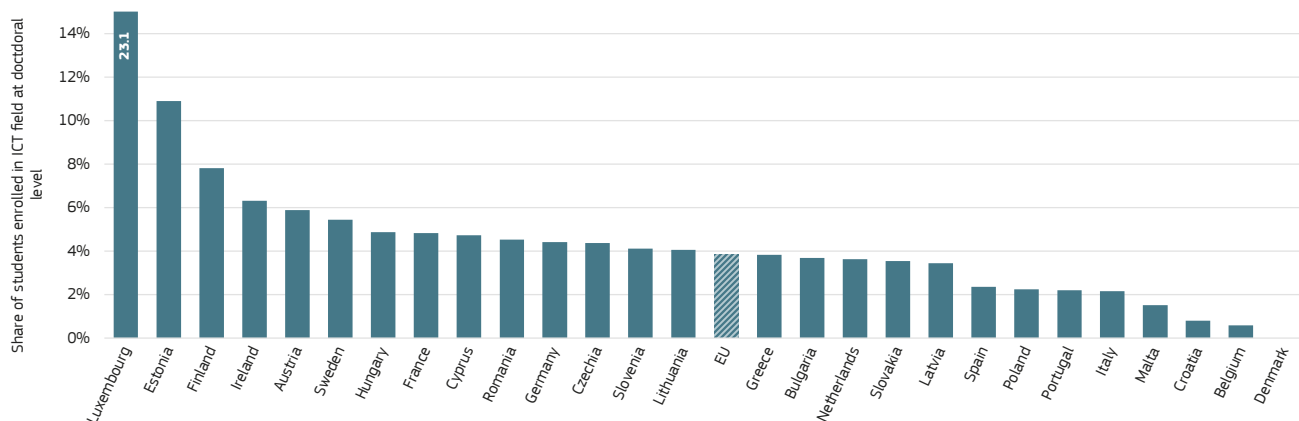
47 ICT plays a strategic role in promoting growth and competitiveness. ICT professionals with a PhD degree are crucial for developing cutting-edge technologies, conducting research, and advancing knowledge in critical areas such as artificial intelligence. ICT is the sector in which much of the productivity growth has originated in the past few years. The lower activity of the EU in this sector explains the EU’s productivity growth gap compared to the US. For more information, see the [2024 Draghi report](#) on the future of European competitiveness. Increasing the number of enrolled students in ICT would also support the EU’s efforts to achieve the Digital decade target of having at least 20 million of ICT specialists in the labour market by 2030. In 2024, there were 10 million ICT specialists at EU level. See also a [2025 European Commission report](#) on the state of the Digital Decade. [Monitor Toolbox](#)

48 From 20,970 in 2015 to 27,769 in 2023. ‘Natural sciences, mathematics, and statistics’ increased by 13.9% and ‘engineering, manufacturing and construction’ by 10.5% in the same period. [Monitor Toolbox](#)

49 Finland (7.8%) Ireland (6.3%), Austria (5.9%), and Sweden (5.4%). [Monitor Toolbox](#)



Figure 5. **Wide country disparities exist in ICT enrolment at doctoral level**



Source: Eurostat (UOE joint data collection 2023). [Download data](#) [Monitor Toolbox](#)

Note: Enrolment in studies involving computer sciences in Denmark are reported under the field “natural sciences, mathematics and statistics”.

### 1.2.2. Drivers of study choice

Many factors drive students’ choice to pursue STEM education<sup>50</sup>. At individual level, they span from early life experiences to broader career considerations. Genuine curiosity and enjoyment in STEM topics from an early age is fundamental to nurture STEM interest. Experiences during primary and secondary education are critical (see Box 1). Mathematics self-efficacy, defined as an individual’s confidence in their ability to successfully perform specific mathematics tasks or activities, has been identified as one of the most important drivers of interest in STEM careers.

50 This section mainly draws upon a [2025 ENESET report](#) on factors influencing STEM participation and effective intervention strategies.

## Box 1. STEM school education

Effective STEM teaching at school is essential for nurturing scientific curiosity and fostering interest in STEM careers from a young age. The way STEM subjects are taught can significantly influence students' interest and perceptions, potentially affecting their desire to pursue these fields further. In this context, both teachers and pedagogical approaches, along with an integrated and up-to-date curricula, play crucial roles.

A forthcoming report<sup>51</sup> indicates that integrated STEM curricula, which bring together the four disciplines — science, technology, engineering, and mathematics — into cohesive learning experiences, lead to improved student outcomes and sustained interest. Unlike the fragmented manner in which subjects are often taught in schools, real-world problems require skills that span multiple disciplines. Research shows that students involved in an integrated curriculum perform as well as, or even better than, their peers receiving traditional instruction in separate disciplines. Furthermore, using an integrated curriculum has been found to enhance interest in STEM and motivation for STEM learning. By linking the STEM curriculum with real-world problems, school education can address the perception of STEM disciplines as isolated and incompatible with communal goals, potentially increasing interest in enrolment at higher levels among those who are more interested in people-oriented occupations, especially girls and women (see [Section 1.2.3](#)).

Pedagogical approaches that incorporate active learning methods, such as project-based learning, inquiry-based learning, and design-based thinking, are also key to boosting student engagement and motivation, thereby enhancing interest in STEM and improving self-efficacy in mathematics. These approaches often involve tackling real-world problems, demonstrating the practical applications and relevance of STEM subjects. They foster a sense of exploration and curiosity essential for scientific and technological inquiry, encouraging students to ask questions, develop hypotheses, and engage in experiments, thus igniting their enthusiasm for STEM. However, integrating STEM disciplines and employing these innovative pedagogical approaches pose significant challenges. Effective interdisciplinary STEM education requires substantial teacher training, curriculum flexibility, and alignment with assessment practices.

Across the EU, nearly all countries report shortages of STEM teachers, particularly in rural, remote, and disadvantaged areas. Initial teacher education often lacks adequate STEM-specific content and pedagogy, while professional development opportunities tend to be fragmented, optional, or unevenly distributed. However, some countries are taking some steps to support teachers. Czechia is piloting innovative STEM teaching methods in schools, by bringing technology experts into classroom and tandem teaching. Bulgaria is installing STEM laboratories in about 1 800 schools, together with a national STEM centre and three regional ones with the support of the Recovery and Resilience Facility (RRF). The centres will coordinate teacher training, educational resources, and students' activities in STEM. In Hungary, the Educational Authority developed a continuing professional development programme to equip teachers with skills to conduct scientifically accurate and engaging activities, sparking students' interest in STEM subjects and career paths. Sweden is taking measures to strengthen the teachers' knowledge of STEM subjects, under its comprehensive strategy covering all education levels.

Additionally, most STEM curricula remain subject-specific and compartmentalised, limiting opportunities for interdisciplinary learning and real-world application. High-stakes assessments and content overload further restrict flexibility at the teacher and school level. However, some countries, such as Estonia, Lithuania, and Czechia<sup>52</sup>, are beginning to adopt more integrated and project-based approaches to address these limitations.

Family background plays a crucial role, too. Higher levels of 'science capital' – which includes components like parental scientific knowledge, family discussions about science, and engagement in science-related activities outside of school<sup>53</sup> – are strongly associated with greater early STEM engagement. Moreover, having at least one parent working in a STEM-related occupation is correlated with a higher probability of performing better in mathematics, which is also a driver of interest in STEM careers. This underscores, on the one hand, how family resources and environment contribute significantly to early STEM engagement, with disparities in 'science capital' often reflecting broader socioeconomic inequalities<sup>54</sup>; on the other hand, it highlights the relevant

role that school systems<sup>55</sup> may have in offsetting for socio-economic disparities and in fostering interest in STEM.

Educational choices are also shaped by what students value in their future careers. This encompasses more than just financial compensation; it reflects long-term aspirations regarding work content, impact and personal fulfilment, developed from early education through adolescence. Evidence shows that STEM careers are perceived as less people-oriented, less geared towards society and less creative than non-STEM careers. These perceptions affect the level of interest in pursuing a career in STEM.

51 For more information, see a 2025 forthcoming Commission report on promoting STEM education in schools.

52 For more details about national developments, see the 2025 Education and Training Monitor's country report for [Bulgaria, Hungary, Sweden, Estonia, Lithuania, and Czechia](#).

53 Evidence shows the significant benefit of providing engaging, challenging, potentially integrated, and outside-school STEM experiences to shape students' aspirations and interests in STEM.

54 As STEM specialists tend to earn more (see footnote 58), there is a risk of perpetuating socio-economic inequalities.

55 Interventions targeting parents who are provided with information about the usefulness and value of a STEM degree seem to yield concrete results (i.e. increasing STEM enrolment). For more information, see a [2025 ENESET report](#) on factors influencing STEM participation and effective intervention strategies.

In addition, study choices are taken within a complex system of institutional factors that vary significantly across the EU. University admission policies, funding models, availability of financial aid for students<sup>56</sup>, labour market needs and conditions<sup>57</sup> all affect study choice. Funding is particularly complex for STEM fields, which are often more costly<sup>58</sup> to deliver than other disciplines, due to specialised infrastructure, equipment requirements and lower student-staff ratios for laboratory work. When funding formulas fail to adequately reflect these higher costs, it can lead to education institutions limiting enrolment growth in high-demand STEM fields despite the need.

Lastly, another key system-level driver of study choice but also of the overall pool of potential entrants into STEM higher education is the permeability between VET programmes and tertiary programmes (see [Section 5.2](#)). VET systems across the EU differ significantly. In some countries, VET focuses on direct job entry with limited or complex university routes, while others offer clearer transitions through bridging programmes, exams, and recognition of prior learning. These transitions affect whether individuals who start with vocational training in a STEM field can pursue STEM studies later in higher education. Policy action can reduce any transitional barriers and administrative hurdles, while promoting options for continued learning.

### 1.2.3. Gender gaps in STEM



Proposed EU-level 2030 target<sup>59</sup>:

**'By 2030, at least 1 out of every 4 students enrolled in STEM fields in initial medium-level VET should be female.'**



Proposed EU-level 2030 target<sup>60</sup>:

**'By 2030, at least 2 out of every 5 students enrolled in STEM fields in tertiary education should be female.'**



Proposed EU-level 2030 target<sup>61</sup>:

**'By 2030, at least 1 out of every 3 students enrolled in ICT PhD programmes should be female.'**

To tackle STEM labour shortages<sup>62</sup>, each 2030 EU-level STEM target proposed as part of the [Union of Skills](#) also calls for an increase in the number of female enrolments in STEM in initial medium-level VET, and at tertiary level, and in ICT at doctorate level.

In medium-level VET, female students are severely under-represented in STEM fields. Fewer than one in six students (15.4%) is female, compared to a proposed 2030 EU-level target of at least one in four<sup>63</sup> (Figure 6). This rate decreased 0.6 percentage points between 2020 and 2023. Only Romania (36.4%) and Bulgaria (27.4%) reached the proposed EU-level target value. By contrast, fewer than one in ten are studying VET STEM fields in Cyprus (8.3%), Ireland (9.0%), Lithuania (9.0%) and Germany (9.5%). The underrepresentation of female students in STEM is much larger than in medium-level VET overall, where on average 44.2% of students in the EU are female. The small STEM subfield in VET of 'natural sciences, mathematics and statistics' enjoys a more

56 Evidence shows that financial aid can have a positive impact on increasing enrolment in STEM fields, especially for disadvantaged students. Currently, nine EU countries (Bulgaria, Estonia, Spain, Croatia, Italy, Latvia, Lithuania, Malta and Slovakia) and the German-speaking community of Belgium provide financial incentives to encourage students to study STEM subjects. [See the 2025 Eurydice system-level indicators](#) on STEM. [Monitor Toolbox](#)

57 High potential earnings in STEM occupations can act as a strong pull factor, but perceptions of demanding work cultures, lack of work-life balance, and gender biases within specific industries can be significant deterrents (see [Section 1.2.3](#)). Regarding the earnings advantage of STEM professionals, evidence on employed recent graduates shows that those graduating from STEM tertiary education are likelier to be at the top of the salary scale than their non-STEM peers. In 2022, 61.9% of recent STEM graduates across the EU were among the 40% of employees with the highest salaries, measured as the gross monthly payment from the main job. This is an advantage of over 20 percentage points compared to their non-STEM peers. Furthermore, this gap remains as they progress in their careers, because among the cohort of recent graduates who finished their studies five years earlier 74.8% of those graduating in a STEM field are in the top 40% versus 53.1% of those graduating in a non-STEM field. The EU average does not include data from Czechia, Cyprus, Lithuania, Poland and Romania. [Monitor Toolbox](#)

58 At tertiary level, STEM disciplines can cost 1.5 to over 2.5 times more per student than humanities disciplines. For more information, see a [2025 ENESET report](#) on factors influencing STEM participation and effective intervention strategies.

59 Proposed in the [STEM education strategic plan](#), part of the [Union of Skills](#).

60 Proposed in the [STEM education strategic plan](#), part of the [Union of Skills](#).

61 Proposed in the [STEM education strategic plan](#), part of the [Union of Skills](#).

62 More women in STEM can also help address the gender pay gap. STEM fields pay higher salaries than non-STEM fields and the lack of women in STEM may worsen the gender pay gap. The [EU Gender Equality Strategy](#) 2020-2025 highlights the importance of tackling the gender gap among STEM graduates amid the rapid development of the digital economy.

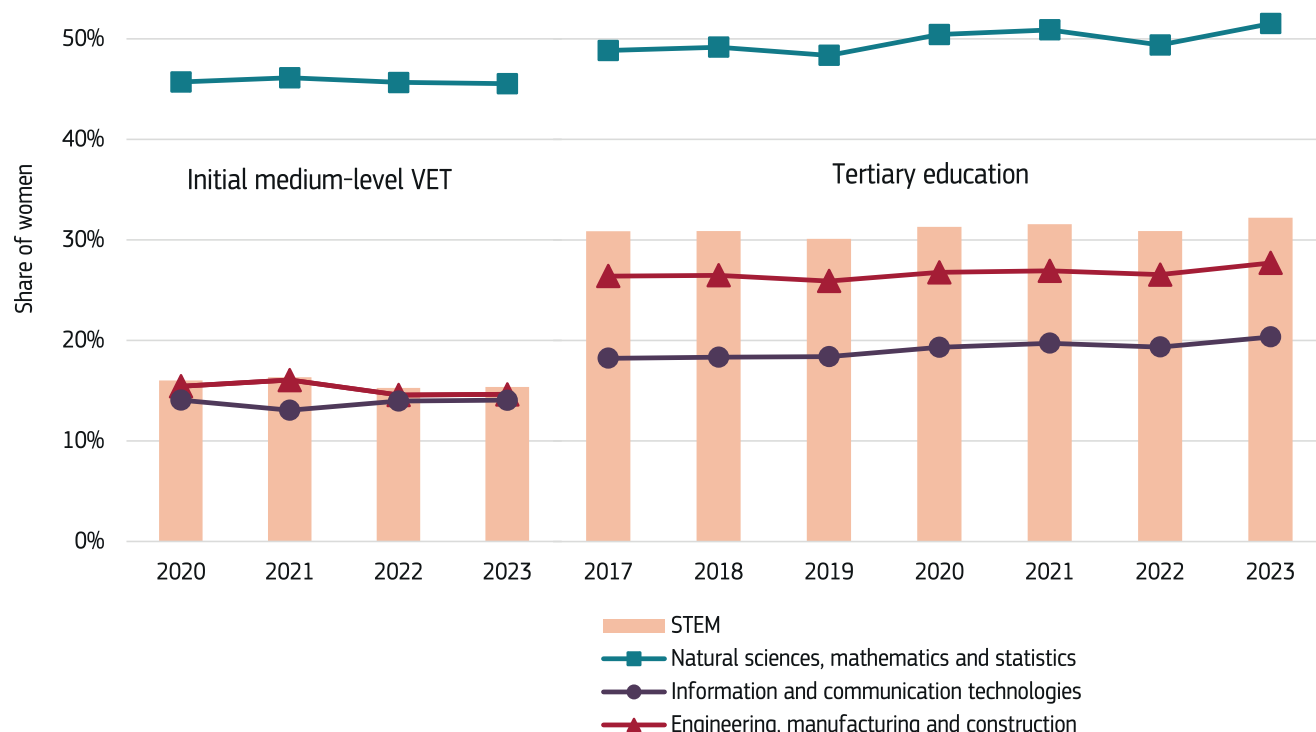
63 2023 figures. [Monitor Toolbox](#)

favourable gender balance, with women accounting for 45.5% of students. However, the under-representation of women is more pronounced in the other two STEM subfields, with the rate of female students dropping to 14.6% in ‘engineering, manufacturing and construction’ and to 14.0% in ICT.

Although the share of women enrolled in tertiary education exceeds<sup>64</sup> that of men, women are under-represented in STEM<sup>65</sup>. They make up one third (32.2%)<sup>66</sup> of enrolled STEM students in tertiary education<sup>67</sup>. This rate is 7.8 percentage points below the proposed 2030 EU-level target of at least two

female students out of every five students (40%). However, this rose by 1.3 percentage points between 2017 and 2023. The rate ranges from 25.4% in Hungary to 37.7% in Sweden. As, in medium-level VET, the female underrepresentation is more severe in certain STEM subfields. Women only account for 20.3% of tertiary students enrolled in ICT, which is the lowest rate of all education fields (STEM and non-STEM), and 27.7% of those studying ‘engineering, manufacturing and construction’. By comparison, the field of ‘natural sciences, mathematics and statistics’ is much more gender balanced<sup>68</sup>: women constitute 51.5%<sup>69</sup> of students enrolled<sup>70</sup>.

Figure 6. **The gender gap is severe in some subfields, yet slowly improving at tertiary level**



Source: Eurostat (UOE joint data collection). [Download data](#) [Monitor Toolbox](#)

Note: Data in 2022 does not include students enrolled in doctoral programmes in the Netherlands.

- 64 54.8% of students enrolled in tertiary education were women in 2023. At doctoral level, female students accounted for 49.4% of the total. [Monitor Toolbox](#)
- 65 Across the EU, 13 countries plus the Flemish community of Belgium currently have a gender equality strategy for all institutions, which encourages female students to enrol in STEM. See [the 2025 Eurydice system-level indicators](#) on STEM. [Monitor Toolbox](#)
- 66 2023 figures. This rate ranges from 25.4% in Hungary to 37.7% in Sweden. [Monitor Toolbox](#)
- 67 The absolute number of women enrolled in STEM rose by 16.4%, while the total number of women in tertiary education grew by 11.4%. [Monitor Toolbox](#)
- 68 In the subfields of ‘natural sciences, mathematics and statistics’, women make up the majority of students only in biology where they top two-thirds (66.9%) of the enrolled students. [Monitor Toolbox](#)
- 69 Women accounted for less than half of all students enrolled in ‘natural sciences, mathematics and statistics’ in Belgium (42.4%), Greece (45.2%), the Netherlands (46.6%), Spain (47.8%), Hungary (47.8%), Luxembourg (48.1%) and Germany (48.4%) in 2023. [Monitor Toolbox](#)
- 70 Women’s participation has improved in all three fields since 2017. Women accounted for 18.2% of ICT students enrolled, 48.8% of those studying ‘natural sciences, mathematics and statistics’ and 26.4% of enrolment in ‘engineering, manufacturing and construction’ in 2017. [Monitor Toolbox](#)



At doctoral level, only 38.0% of STEM students are women. The rate is higher in 'natural sciences, mathematics and statistics' (46.0%), but drops to 31.2% in 'engineering, manufacturing and construction' and to 24.3% in ICT. On average, the EU is about 9 percentage points away from the proposed 2030 EU-level target of at least one in three ICT students at doctoral level being female. Most EU countries have rates below 30% and only five<sup>71</sup> have already reached the proposed EU-level target value. However, the trend over time is positive. Across the EU, the female share in ICT at doctoral level jumped 2.2 percentage points since 2017, the highest increase among all the broad fields of education<sup>72</sup>.

The gender gaps in STEM result from deeply rooted family, school, social and cultural factors that are evident well before the time of enrolment. Although school achievement may have an impact on study choice, differences in school outcomes<sup>73</sup> between girls and boys only moderately explain the STEM gender gaps in higher education and on the labour market. Even high-achieving girls<sup>74</sup> are often held back by other factors such as a lower self-confidence and self-efficacy in STEM subjects<sup>75</sup>.

Girls' lack of confidence in their abilities in mathematics and science and their resultant low expectations of working in STEM careers could also be due to an absence of role models. The paucity of women scientists means that young girls have little in the way of tangible evidence to disprove the stereotypical notion that mathematics and science are somehow more 'male' disciplines<sup>76</sup>.

Also relevant is thus the female friendliness of STEM educational environments and the extent to which gender stereotypes – to whom girls are exposed from a very young age – about the roles that men and women should play in society and in the economic sphere are salient<sup>77</sup>. Women may

be discouraged from choosing STEM careers because of the perception of STEM professions being more 'things-oriented' as women tend to endorse goals to help and work with people<sup>78</sup> more than men. Women's greater preference for work that has communal goals might explain why female enrolment rates are higher in some STEM subfields such as biology, and lower in ICT subfield, which are perceived as emphasising technical performance and individual achievement<sup>79</sup>. At doctoral level, a perceived masculine orientation of STEM academic work may discourage women from continuing to practice STEM beyond a master's degree<sup>80</sup>. Particularly intense lab or field work may be incompatible with family caring duties which tend to fall to women<sup>81</sup>.

The existence of these gender stereotypes at home are carried forward in the classroom by teachers. They are important contributors to gendered stereotypes and can have a negative influence on girls' mathematics performance. Teacher bias (favouring boys) is a major factor in students' performance and choice of field of study. All these factors work cumulatively<sup>82</sup> and affect women as they progress through school and higher education and onto the labour market, deterring women from enrolling in STEM or impacting female preferences for some STEM fields.

71 Malta (41.7%), Cyprus (41.2%), Estonia (38.2%), Croatia (36.8%) and Ireland (34.5%).

72 2017–2023 comparison. Smaller increases have been recorded in 'engineering, manufacturing and construction' (1.4 percentage points) and in 'natural sciences, mathematics and statistics' (0.8). [Monitor Toolbox](#)

73 PISA 2022 shows that on average, while there are no gender differences in underachievement in mathematics, boys are more frequently top performers than girls. There is a similar pattern in science, although the gender gaps are bigger in mathematics. For more information, see the [2024 European Commission report](#) on the PISA 2022 results.

74 PISA 2022 shows that when students are asked about what kind of work they expected to have when they were 30 years old, the proportion of girls choosing a STEM occupation is 11% lower than that of boys with the same level of proficiency in mathematics.

75 For more information, see a [2020 EENEE report](#) on gender differences in tertiary education and a [2024 NESET report on addressing gender gap in STEM education across educational levels](#).

76 For more information, see a [2023 OECD report on gender equality](#).

77 For more information, see a 2019 [research paper](#) on the gender gap in STEM fields.

78 This results in women largely occupying the health and education sector. In 2024, more than 70% of the health and teaching professionals were women (71.5% and 72.9% respectively), despite men represented the majority of the [workforce](#) (53.4%). The gender imbalance among teaching professionals is consistent across countries, as the female share ranges from 64.5% of women in Malta and 65.7% in Denmark to 85.7% in Bulgaria and 89.4% in Latvia.

79 The strength of the science-is-male stereotype and the associated gender segregation varies across STEM fields. For more information, see a [2020 EENEE report](#) on gender differences in tertiary education and a [2024 NESET report on addressing gender gap in STEM education across educational levels](#). In such a case, guidance and counselling services may also help encourage more women enrol in STEM. Across the EU, 16 education systems provide guidance and counselling measures aimed at encouraging more female students to study STEM subjects in higher education. See [the 2025 Eurydice system-level indicators](#) on STEM. [Monitor Toolbox](#)

80 Women are also underrepresented in STEM academic staff. At the highest level of an academic career, women only accounted for 20.3% of all staff in 2022. For more information, see a [2025 European Commission report](#) on gender equality in R&I in the energy transition.

81 For more information, see a [2024 European Commission report](#) on gender balance in the R&I field.

82 To explain the gender gap in STEM, researchers often invoke the 'leaky pipeline' metaphor. The STEM pipeline leaks individuals at various career junctures (women more so than men): secondary school students interested in STEM sometimes change their minds when applying to university, others enrol in STEM but change fields before graduation, or graduate in STEM but later enter non-STEM occupations.

## Box 2. Addressing gender bias in STEM

Narrowing gender gaps in education requires a multifaceted, concerted, lifelong approach involving schools, including teachers, parents and employers<sup>83</sup>.

Teachers and parents can help build girls' confidence in their abilities in mathematics and science by evaluating their actual abilities. Training teachers to recognise and address any biases they may hold about boys and girls will help them to teach more effectively so that students make the most of their potential. EU Countries are making important strides to make teachers more gender aware, teaching materials more gender neutral and more girls motivated to study STEM subjects. For instance, France<sup>84</sup> has launched the 'girls and maths' action plan to boost girls' interest, performance and career ambitions in maths and technical subjects. The plan involves teachers and parents. It sets out several measures, including raising teachers' awareness on gender bias when teaching, and targets for girls choosing advanced mathematics and science in high school.

At the EU level, the 'Girls go STEM' initiative, included under the STEM education strategic plan, seeks to attract and train one million female secondary students in STEM by 2028, including through vocational pathways. To support implementation, tailored teacher training programmes will prepare educators for delivering innovative STEM education. STEM curricula that highlight the social roles of STEM occupations can also have a positive impact on female STEM enrolment (see Box 1).

Female role models, particularly in traditionally male-dominated fields such as ICT, can help address gender gaps by challenging stereotypes, and fostering a more inclusive environment. With the support of ESF+, Poland is encouraging girls to pursue careers in ICT by organising workshops led by female university students which showcase ICT is rewarding and accessible for women. University of Luxembourg launched the campaign 'Girls in SciTech: Building a Future for Girls in Science and Technology' to promote greater female participation in science and technology careers. Similarly, the 'Shaking up Tech' event, organised annually by Aalto University in partnership with other Finnish universities, aims to inspire young women to explore technology as a field and career, through inspirational talks, hands-on workshops, and university fairs<sup>85</sup>. Riga TechGirls in Latvia offer numerous programmes, supporting women at all levels of technological proficiency, from beginners to startup founders.

Policies aimed at improving workplace conditions within STEM sectors – promoting flexibility, supporting continuous professional development, ensuring equal pay and career progression opportunities, providing adequate and affordable childcare support, and actively combating gender bias – are complementary and also crucial for making STEM careers appealing to girls and women.

## Main takeaway

The share of students enrolled in STEM has not grown significantly in recent years. In 2023, 36.3% of medium-level vocational education and training (VET) students were enrolled in STEM fields, with significant variation and fluctuations across EU countries. STEM enrolment in tertiary education averages 26.9%, having decreased by 0.7 percentage points over the past decade. At doctoral level, nearly four in ten students are enrolled in STEM fields. However, only a small share of them (3.8%) are enrolled in ICT. Enrolment in STEM is driven by many factors, including early school experiences, family environment and institutional factors. Moreover, women are under-represented in engineering and ICT and female participation is below the EU-level targets proposed for 2030. A number of factors contribute to a lack of diversity in STEM fields, hindering the expansion of the STEM workforce, such as perceptions about STEM careers.

83 The science-is-male stereotype affects not only the career aspirations of female graduates in STEM fields, but also employers' evaluations of job applicants.

84 For more details about national developments, see the 2025 Education and Training Monitor's country reports for [France](#).

85 For more details about national developments, see the 2025 Education and Training Monitor's country reports for [Poland](#), [Luxembourg](#), and [Finland](#).



## CHAPTER 2. YOUNG PEOPLE'S BASIC SKILLS

Strong basic skills are a vital factor in Europe's competitiveness, preparedness for the future and social cohesion. Today, too many young people and adults across the EU struggle with reading, math, science, digital and citizenship skills – and this is threatening people's ability to thrive, democracy, and the innovation potential that underpins competitiveness. In response, the European Commission's [Action Plan on Basic Skills](#), under the Union of Skills, lays out a bold strategy to turn things around, as requested by the Commission President in her political guidelines. The plan also suggests a wider notion of basic skills that includes citizenship and digital skills to address the challenges of a rapidly evolving society and economy. This chapter<sup>86</sup> looks at the latest evidence on young students in some of the basic skills prioritised in the Action Plan: mathematics, computer and information literacy and civic knowledge.

### 2.1. A closer look at mathematics



EU-level 2030 target<sup>87</sup>:  
**'By 2030, the share of underachievement in reading, mathematics and science should be less than 15%.'**



Proposed EU-level 2030 target<sup>88</sup>:  
**'By 2030, the share of top performance in reading, mathematics and science should be at least 15%.'**

The capacity to reason mathematically and think logically is essential for individuals to make sound decisions in today's fast-evolving, technology-driven society. Mathematical reasoning includes, for example, the ability to understand quantities, abstraction, and variation. As one of the basic skills domains, proficiency in mathematics is linked to better academic and professional outcomes and prospects later in life. With mathematics as the focus of its 2022 assessment cycle, the OECD's Programme for International Student Assessment (PISA) provides a comprehensive picture of students' mathematics skills across EU education systems<sup>89</sup>. Results indicate that a significant proportion of students

<sup>86</sup> [Chapter 7](#) will come back to the topic of basic skills among the EU's adult population.

<sup>87</sup> Proposed in the [STEM education strategic plan](#), part of the [Union of Skills](#).

<sup>88</sup> Proposed in the [STEM education strategic plan](#), part of the [Union of Skills](#).

<sup>89</sup> For a more comprehensive summary, alongside reading and science performance, see the [2024 European Commission report](#) on the PISA 2022 results, and the 2024 Education and Training Monitor's [comparative report](#).



(29.5%) underachieve, and few (7.9%) achieve excellence<sup>90</sup>. Compared to other large, advanced economies, the EU has the second lowest (after the US) top performance rate and the second highest (after the US) underachievement rate in mathematics. During the period 2012–2022, the EU did not improve its relative performance compared to other non-EU G7 economies<sup>91</sup>.

These findings are a wake-up call for action to improve young people's basic skill levels. National-level research confirms that the COVID-19 pandemic adversely affected educational performance in many EU countries<sup>92</sup>. However, COVID-19 is only part of the picture. Structural drivers are at play and provide some possible explanations for the observed decline

in mathematics performance and how to address it<sup>93</sup>. This section discusses three such drivers.

Firstly, PISA 2022 data show that digital distractions — including the non-educational use of digital devices during lessons — negatively affect learning. For example, 32.1% of students across the EU reported frequent digital distractions in math lessons<sup>94</sup>. The findings from a [2024 OECD working paper](#) confirm the negative impact of excessive smartphone and social media use on student performance. The paper suggests that the use of digital devices in schools for non-educational purposes could be the main driver behind the worldwide decline in PISA scores since 2009<sup>95</sup>.

### Box 3. Smartphone bans in schools

Mobile phones have become virtually ubiquitous in the lives of young people and children across Europe, sparking extensive debate over their impact on education. Concerns over their negative effects on learning, social behaviours and wellbeing have prompted significant policy responses in recent years, with numerous European countries and regions implementing restrictions and even complete bans on mobile phone use in schools.

Different strategies are being adopted across the EU. In August 2025, French-speaking schools in Brussels and Wallonia banned the recreational use of smartphones from kindergarten through secondary schools, although educational use will continue under guidelines for responsible use of digital tools. A ban on the use of mobile phones by children in preschool and grades 1–6 came into effect from May 2025 in Latvia in all schools, except in cases where the teacher has permitted their use during the learning process. In Croatia, some local governments have banned mobile phones in all primary schools, and individual secondary schools may also impose bans at their discretion. In Spain, mobile phone regulations vary between autonomous communities, with about half enforcing general or total bans, while others allow schools implement their own rules. In 2024, Portugal advised against mobile phone use for students up to high school and limited usage during breaks for older students, although this remains a non-binding recommendation. Greece introduced a new 'Mobile phone in the school bag' policy for the 2024–2025 school year, allowing students to bring mobile phones to school, provided they remain deactivated inside their school bags during school hours. In Luxembourg since spring 2025, smartphones are forbidden completely in primary schools and their use during class is also forbidden in secondary schools. Beyond that, secondary schools are allowed to enforce stricter rules<sup>96</sup>.

While evidence suggests that phone bans are effective in terms of performance and reducing bullying, other research reveals mixed results, emphasising the importance of local contexts. Critics of universal bans note the potential benefits of mobile devices in supporting students with special needs and ensuring access to resources, as seen during the COVID-19 pandemic. Instead of outright bans, some advocates suggest integrating smartphones into curricula to promote digital literacy and responsible use.

Ultimately, phone bans may be more effective if they target specific aged groups and are accompanied by comprehensive digital literacy programmes, parental involvement, and flexible policy-making that considers student autonomy and equity<sup>97</sup>.

90 Socio-economic background continues to exert a strong influence on educational outcomes. For a closer look at the effects of socio-economic background, see [Section 4.2](#), [Monitor Toolbox](#).

91 Looking also at reading and science, the other two PISA fields, the comparison with other non-EU G7 economies looks rather unfavourable for the EU. The EU has the highest underachievement rate and the lowest top performance rate in reading and science. For more details, see the [2024 European Commission report](#) on the PISA 2022 results.

92 Learning losses — particularly in mathematics — are likely to persist unless major remedial actions are taken. See a [2023 European Commission \(Joint Research Centre\) technical report](#) on the impact of COVID-19 school closures and a [2023 ENEEE analytical report](#) on COVID-19 learning deficits.

93 See a [2025 ENESET ad hoc report](#) on factors contributing to basic skills decline for a more comprehensive discussion.

94 See the [OECD 2023 report](#) on the PISA 2022 results (Volume II). Other disciplinary factors are reported to also show a negative, though weaker, association with mathematics performance.

95 An intensive use of digital devices for leisure could affect attention spans, the amount of time spent on studying and sleeping habits.

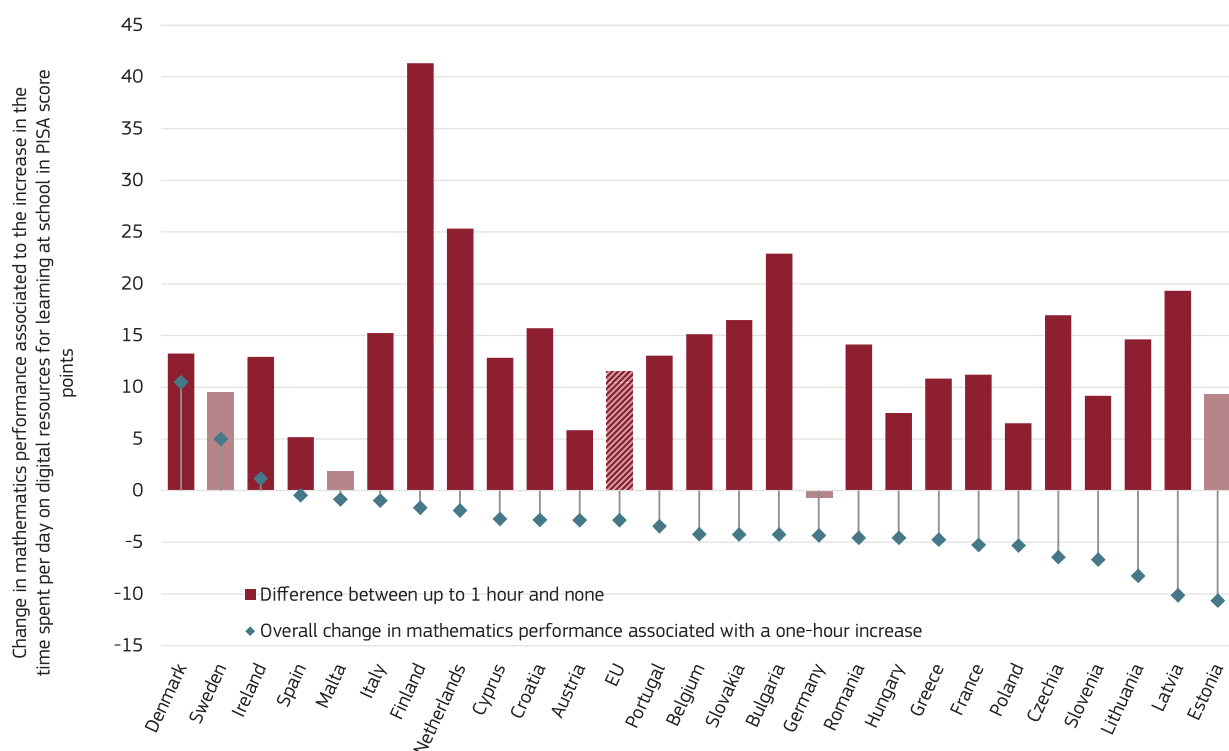
96 For more details about national developments, see the 2025 Education and Training Monitor's country reports for [Belgium](#), [Croatia](#), [Greece](#), [Latvia](#), [Luxembourg](#), [Portugal](#), and [Spain](#).

97 For more information, see a 2025 forthcoming ENESET report on Mobile phone bans in European schools.

When used for educational purposes, the impact of digital technologies is more nuanced. Moderate use of digital resources is often associated with better mathematics performance in PISA data, while the opposite holds true in the case of more intense use. Figure 7 shows that the association is strongly positive in most countries when students move from no use to up to one hour per day. When intensity further increases, the relationship tends to become negative (i.e. performance worsens when the number of hours per day rise), so that the overall change in mathematics performance associated with a one-hour increase in using digital devices appears negative and statistically significant in most countries. Denmark and Sweden are two notable exceptions to this pattern: in these

countries, the overall change is positive and statistically significant. A [2024 European Commission \(Joint Research Centre\) study](#), controlling for a large number of potentially confounding factors, produced equally mixed results. On the one hand, the study finds no positive association between the use of digital technologies in mathematics classes and students' mathematics performance. On the other hand, it finds that students tend to achieve higher mathematics test scores in schools providing their teachers with training in integrating digital resources into mathematics instruction<sup>98</sup>. Clearly, education policies that promote a responsible use of digital resources and a purposeful integration of technology into instruction are essential.

Figure 7. **Only a moderate daily use of digital tools for learning is positively associated with mathematics performance**



Source: OECD PISA 2022. [Download data](#) [Monitor Toolbox](#)

Note: Caution is required when interpreting 2022 data for Denmark, Ireland, Latvia and the Netherlands because one or more PISA sampling standards were not met. The figure shows the score differences after accounting for students' and schools' socio-economic profiles. Lighter columns indicate differences that are not statistically significant. Countries are shown in descending order by the overall change in mathematics performance associated with a one-hour increase in the time spent per day.

<sup>98</sup> This is supported by the academic literature, which suggests that computer-assisted learning, especially when tailored to disadvantaged students, appears more effective than simply increasing access to technology.



Secondly, the shortage of teachers has worsened across Europe, exacerbated by the pandemic. Schools experiencing greater teacher shortages saw sharper learning declines<sup>99</sup>. At the same time, PISA 2022 data underline the importance of teacher support<sup>100</sup>. Students who feel supported by their teachers tended to perform better at mathematics, experience less anxiety, and report a greater sense of belonging in school<sup>101</sup>. Teacher efficacy, in turn, is influenced by their instructional adaptability<sup>102</sup>, wellbeing and working conditions. Teachers who report having sufficient time for instructional tasks and a healthy work-life balance are more likely to establish positive relationships with students and manage their classrooms effectively. Job satisfaction contributes to a teacher's confidence and motivation.

Thirdly, another important driver of mathematics performance is parental involvement. Between 2018 and 2022, there was a sizeable decline in parents' participation in school-based learning activities in many countries<sup>103</sup>. At the same time, education systems that managed to maintain or increase levels of parental involvement saw more stable or even improved student outcomes, particularly in the case of disadvantaged students. For instance, where parents were in contact with teachers to discuss their child's progress, mathematics scores showed a more favourable trend. Students with strong support at home also reported more positive attitudes towards school and learning in general.

According to a 2025 Eurydice report<sup>104</sup>, a wide range of policy responses have been implemented since the onset of the COVID-19 pandemic to address the basic skills gap across EU education systems. Many EU education systems introduced new learning support measures, most commonly through new policy frameworks and small-group tutoring during or outside regular school hours<sup>105</sup>. Research shows that tutoring is among the most consistently effective interventions<sup>106</sup>, particularly when offered during the school day by professionally trained staff<sup>107</sup>. Notably, online tutoring — widely adopted during the pandemic — has also proven to be effective under certain conditions<sup>108</sup>.

At system level, most EU countries have adopted comprehensive frameworks that integrate both long-term strategic goals and short-term targeted initiatives. These frameworks typically combine three key components: prevention, which focuses on early identification of learning difficulties; intervention, which involves tailored instruction and mentoring; and compensation, which seeks to mitigate socio-economic or other forms of disadvantages and maintain student engagement. The success of these strategies hinges on effective monitoring mechanisms and high-quality professional development for teachers.

99 See a [2023 working paper](#) from KU Leuven.

100 These findings are from a [2025 OECD report](#) on teacher support for student learning.

101 Interestingly, socio-economically disadvantaged students were more likely than their peers to report receiving high levels of teacher support, suggesting that effective teacher-student relationships may serve as a compensatory factor in reducing the educational inequities set out in [Section 4.2](#).

102 Instructional adaptability — such as providing individualised support and helping students set and reach learning goals — is positively correlated with student outcomes and teacher efficacy.

103 See the [OECD 2023 report](#) on the PISA 2022 results (Volume II).

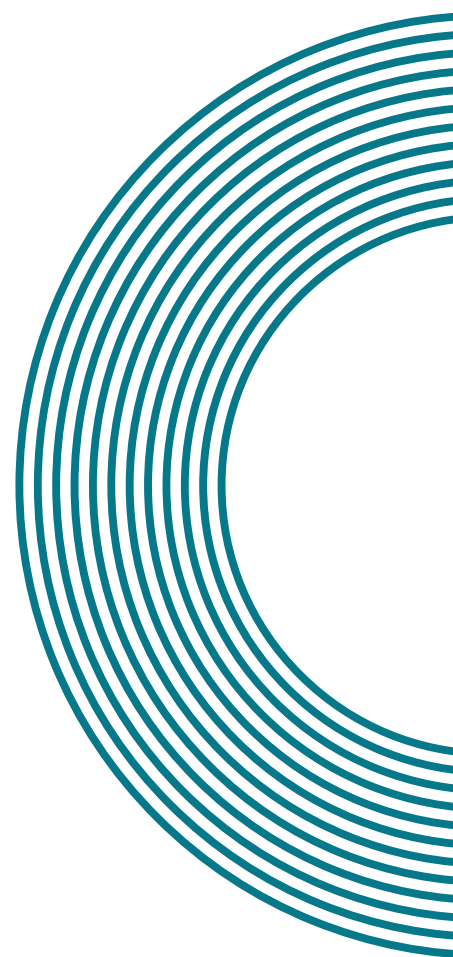
104 See the [2025 Eurydice report](#) on addressing underachievement in basic skills at school.

105 Most of the other education systems have had learning support measures in place since before 2020-21.

106 See the [2022 final report](#) of the European Commission expert group on quality investment in education and training. The topic of tutoring is picked up again in [Section 4.2](#).

107 See a [2021 discussion paper](#) from the IZA institute of labour economics.

108 See a [2020 working paper](#) from the US national bureau of economic research (NBER).



## Box 4. Promoting excellence

A 2025 ENESET analytical report<sup>109</sup> systematically reviews the evidence about which policies and practices can help education systems promote excellence in basic skills. Evidence suggests that there is not necessarily a trade-off between excellence and equity: where education policies and practices are carefully designed to benefit all student groups, the two goals can complement one another. Three broad strategies appear promising.

First, system- and school-level stratification mechanisms, such as tracking or ability grouping, should be carefully designed to maximise the academic challenge for top performers while avoiding negative impacts on equity. Delaying formal tracking until after lower secondary education reduces early segregation, allowing more students to achieve higher levels before specialisation, while preserving pathways to excellence. Flexible ability grouping within schools and classrooms enables teachers to differentiate instruction more effectively based on the students' needs.

Second, self-regulated learning strategies (such as goal-setting, monitoring, reflection) and project-based learning can support all students, especially high achievers, in developing self-directed learning capacities and engaging in complex, inquiry-based tasks. Embedding these strategies into teaching requires targeted professional development, as many teachers may not yet be familiar with these practices.

Third, the use of free or open-access digital tutoring platforms to support optional enrichment activities, differentiated homework, and independent learning projects offers an effective and efficient way to expand learning opportunities, even in under-resourced environments. This is consistent with evidence showing that top performers benefit from autonomous, cognitively demanding tasks when these are structured into regular learning.

At national level, targeted support for top-performers is not yet common, but EU countries have started supporting talented and gifted<sup>110</sup> students. For instance, Austria offers individualised learning experiences (such as research weeks and science clubs) to talented students and plans to establish specific secondary schools for gifted students within the academic track. In Bulgaria, the new school curriculum will emphasise additional opportunities to overcome educational difficulties and to foster excellence. The German 'Leistung macht Schule' programme aims to recognise high-achieving and particularly capable learners with professionalised diagnostics, didactics, and lesson design. The Danish agency for education and quality provides screening tools for first- and second-grade students and advice on adapted teaching for educational staff and parents<sup>111</sup>.

In addition, broader curriculum reforms have been implemented to improve teaching quality and outcomes. Many education systems have increased the amount of teaching time allocated to basic skills subjects, extended the length of the school day, and revised curricula to emphasise core competencies<sup>112</sup>. These reforms often aim to foster deeper learning — particularly in STEM subjects.

Another central element of recent reforms is to provide a boost to continuing professional development. Since the 2020/2021 school year, most EU education systems have introduced new or revised teacher-training programmes aimed at improving teaching in mathematics, literacy and science, and inclusive teaching practices. These programmes vary in scope and delivery, ranging from centralised national initiatives to more targeted, school-level approaches. Digital learning platforms and structured teaching materials are increasingly being used to ensure consistency and coherence in teaching practices<sup>113</sup>.

## 2.2. Digital skills



EU-level 2030 target<sup>114</sup>:  
**'By 2030, the share of underachievement in computer and information literacy should be less than 15%.'**

The digital transformation is reshaping how people learn, work, and engage in civic life across the EU. As digital technologies have become integral to everyday activities, digital skills — understood as the ability to use digital tools effectively and critically — have become a basic skill for full participation in society and the labour market, as suggested in the [Action Plan on Basic Skills](#). As people spend more time in the digital environment, their access to opportunities increases, but so does their exposure to risk. One risk that is gaining policy attention is cyberbullying. Moreover, the digital transition has also amplified the risks from misinformation and disinformation by allowing the accelerated spread of false or misleading content across online platforms, including through various forms of foreign information manipulation.

109 See the [2025 ENESET report](#) on Effective measures to promote excellence in basic skills.

110 Students with outstanding intellectual ability or talent who requires changes to their education to achieve their full potential. Note that the definition and classification of gifted students may vary across national education systems.

111 For more details about national developments, see the 2025 Education and Training Monitor's country reports for [Austria](#), [Bulgaria](#), [Germany](#), and [Denmark](#).

112 See a [2025 Eurydice report](#) on addressing underachievement in literacy, mathematics, and science.

113 See a [2025 Eurydice report](#) on addressing underachievement in literacy, mathematics, and science. Several ongoing Horizon Europe research projects are assessing the effectiveness of various education measures, including in basic skills. When becoming available over the coming years, their results will contribute to a better understanding of 'what works' in raising young people's basic skill levels. See for instance the [EFFEct](#) project led by KU Leuven.

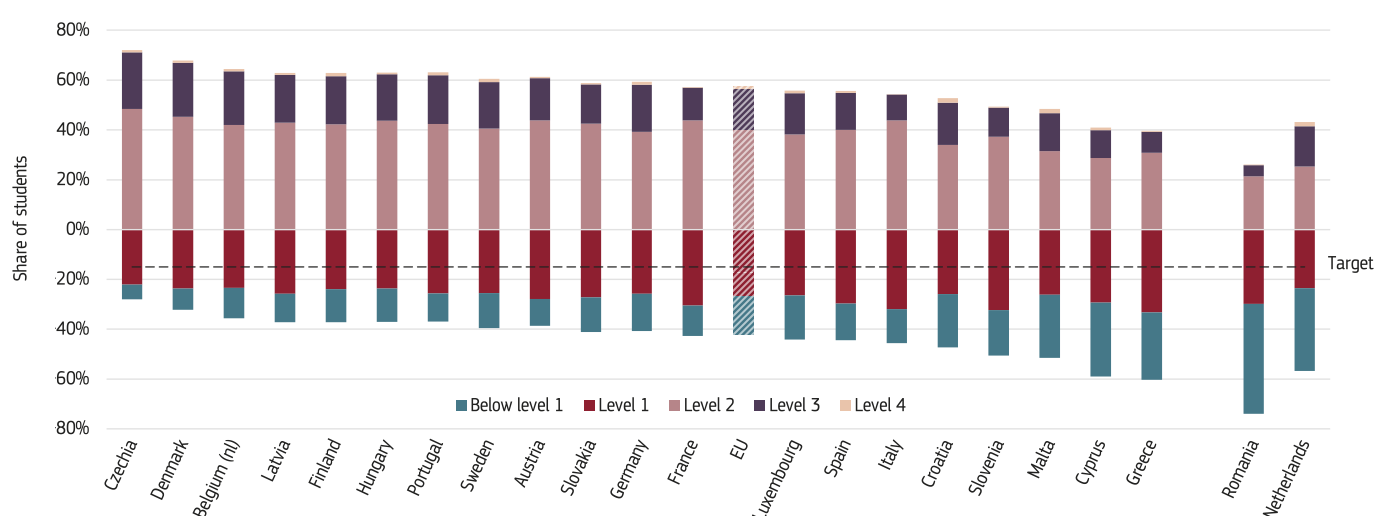
114 Originating in [2021 EEA strategic framework Resolution](#).

These phenomena may threaten democratic discourse, public health, and social cohesion, highlighting the need for digital media literacy as a key element for preparedness<sup>115</sup>.

EU countries have been investing heavily in digital infrastructure and education. Yet, despite growing access to devices and internet connectivity, not all students are acquiring the digital skills they need. Socio-economic, regional and territorial disparities, inconsistent use of technology in schools, and unequal levels of teacher preparedness continue to create gaps in digital learning outcomes<sup>116</sup>.

The EU has committed to reducing the proportion of underachieving<sup>117</sup> eighth-grade students (aged 13 or 14) in digital competence to below 15% by 2030. The latest figures show just how challenging it will be to meet this objective. Across the EU-22, 42.5% of students score below the minimum proficiency threshold in computer and information literacy (Figure 8)<sup>118</sup>. The rate ranges from 28.0% in Czechia to 74.0% in Romania. All EU countries remain far short of the target. Moreover, all EU countries that had participated in ICILS 2013 saw a statistically significant increase in underachievement between 2013 and 2023<sup>119</sup>.

**Figure 8. No less than 42.5% of students in grade 8 (13–14 years-old) score below the minimum threshold in computer and information literacy**



Source: ICILS 2023. [Download data](#) [Monitor Toolbox](#)

Note: Results for the Netherlands and Romania are excluded from the EU average (the Netherlands had a weighted student participation rate of less than 50% and Romania did not meet the required timing criteria); data for Belgium pertain solely to its Flemish community. Countries are shown in ascending order based on their share of students at level 1 or below.

In most EU countries, girls tend to outperform boys in computer and information literacy by around 8 percentage points (38.4% compared with 46.3%). However, this varies by country ranging from 2 percentage points in Czechia to 14 percentage points in Croatia<sup>120</sup>. While these findings challenge the commonly held stereotype that boys have better digital skills, the gender gap narrows or disappears in countries where digital education is more embedded across the curriculum and where there is equal access to digital tools. While girls tend to outperform boys on average, boys

often report higher self-efficacy in technical digital tasks, revealing a gap between performance and confidence that underscores the need for more inclusive and empowering digital education strategies.

Socio-economic background has a strong and consistent relationship with computer and information literacy. For instance, the underachievement rate of students with at least one parent who has completed university education is, on average, 32.4% compared with 48.6% for their peers

<sup>115</sup> See the [2025 European Preparedness Union Strategy](#).

<sup>116</sup> See a [2020 European Commission \(Joint Research Centre\) technical report](#) on the likely impact of COVID-19 on education.

<sup>117</sup> Underachievement is defined as not being able to complete basic information-gathering and management tasks, locate explicit information from digital sources, and make basic edits to content. Underachieving students do not understand personal data protection strategies and recognise the implications of personal information being publicly accessible.

<sup>118</sup> **Monitor Toolbox** Data are from the International Computer and Information Literacy Study (ICILS) 2023, conducted by the International Association for the Evaluation of Educational Achievement (IEA). The EU average incorporates the results of the 22 participating EU countries. The French community of Belgium, Bulgaria, Estonia, Ireland, Lithuania, and Portugal did not participate in the 2023 survey.

<sup>119</sup> **Monitor Toolbox** This concerns all participating countries with data for 2013 and 2023: Croatia, Czechia, Germany, Slovakia and Slovenia. The picture is more mixed when comparing 2018 and 2023. Among the participating countries with data for 2018 and 2023, Denmark, Finland, France, Germany and Portugal saw a decline (statistically significant for all except France and Portugal), while Italy and Luxembourg recorded a statistically significant improvement over this period.

<sup>120</sup> **Monitor Toolbox**

with parents with lower qualifications. These differences are particularly pronounced in Hungary, Slovakia, Luxembourg, the Netherlands and Portugal, where they exceed 20 percentage points.<sup>121</sup> Unequal access to technology further compound these differences. Students living in households with fewer than two computers scored significantly lower than their peers, with the largest gap – over 64 points – recorded in the Flemish community of Belgium. Similarly, the quality

of internet access at home plays a role: students with a stable connection scored on average 23.9 points higher than those experiencing frequent disruptions. In Romania, where nearly half of students reported connectivity problems, the performance gap reached 62.7 points. These findings reveal that digital access remains uneven and that infrastructure, though improving, is still a barrier to digital inclusion<sup>122</sup>.

### Box 5. Generative AI: what possible impact on education?

Experimental research on the impact of the use of generative AI tools – in particular large language models (LLMs) – on learning is still very limited, but some primary evidence on potential risks for educational outcomes is emerging from recent studies. For example, a [2024 randomised controlled trial](#)<sup>123</sup> about the use of generative AI as part of mathematics classes has involved nearly 1 000 secondary students in Türkiye. Its results show that access to generative AI significantly improves performance. However, when access to AI is subsequently taken away, students actually perform worse than those who have never had access. Those negative effects are largely mitigated if specific safeguards are included in the AI tool (e.g. giving students hints without actually providing them the right answer to a question). Other [studies](#) indicate that over-reliance on large language models or using them to shortcut mental processes have negative effects.

This is consistent with evidence from neuroscience. A [2025 study](#) investigated the cognitive effort required to use an LLM when writing an essay in an US educational setting. Compared with a group using no digital tools, LLM users displayed weaker brain connectivity. Over four months, LLM users consistently performed worse in terms of brain activity and language use. These findings raise concerns about the long-term effects of relying on LLMs in education and highlight the need for further research into the impact of AI on learning. Thorough planning and consideration are essential to effectively and responsibly integrate generative AI in education. This includes fostering AI literacy, providing comprehensive training and guidelines for educators, and ensuring equitable access to generative AI tools for all students<sup>124</sup>.

Another important research area is the impact of AI equity and inclusion in education. A [2024 OECD report](#) emphasises the potential of AI to support adaptive learning tailored to individual needs, which can help reduce learning gaps, and support teachers. However, it also warns of significant ethical and privacy risks, and stresses the need for clear accountability in how data are used and decisions are made. Cultural responsiveness is another priority, with AI tools needing to reflect diverse values and avoid reproducing biases. In addition, socio-emotional development could be undermined if AI displaces human interaction. It is therefore vital to ensure that teachers are provided with comprehensive training to ensure that they can critically and effectively use AI.

Some EU countries such as Croatia, Estonia and Poland are introducing measures to boost not only students' skills but also teachers' competences. In Ireland, guidance is provided to teachers on AI use in teaching and learning, while in Malta, ICT and AI tools are introduced across school levels and teacher training is integral part of the 2025-2030 Digital Education Strategy<sup>125</sup>.

Teacher capacity remains a key factor in advancing digital education, though training practices vary significantly across Europe. Most countries include digital skills in both initial teacher education and professional development, and several have adopted structured national strategies<sup>126</sup>. Digital skills are generally addressed in initial teacher education, but retraining practices diverge widely<sup>127</sup>. A prominent issue is the teaching of informatics. In primary education, teachers usually cover digital content, but in secondary schools, informatics becomes a distinct subject

requiring specialised training. Since few professionals with an informatics background enter the teaching profession, many countries retrain teachers from related disciplines such as mathematics, physics or business. In some cases, EU education systems also rely on informatics professionals without formal teaching qualifications, raising concerns about consistency and quality of the teaching offer.

Continuing professional development plays a critical role in bridging gaps left by initial training and adapting to evolving

121 The topic of socio-economic background is picked up again in [Section 4.2](#).

122 Language background and migration status also correlate with student outcomes. In many countries, students who speak a different language at home than the one used in school tend to score lower in computer and information literacy. Although these differences are not always statistically significant, they suggest that language barriers can hinder digital engagement and highlight importance of culturally and linguistically responsive digital content.

123 A randomised controlled trial (RCT) is a research method where participants are randomly assigned to either an experimental group receiving a new treatment or a control group receiving a standard treatment. The purposed of randomisation is to minimise bias and create comparable groups, allowing researchers to assess the true effect of measures.

124 See a [2025 European Commission \(Joint Research Centre\) report](#) on generative AI.

125 For more details about national developments, see the 2025 Education and Training Monitor's country reports for [Croatia](#), [Estonia](#), [Poland](#), [Ireland](#), and [Malta](#).

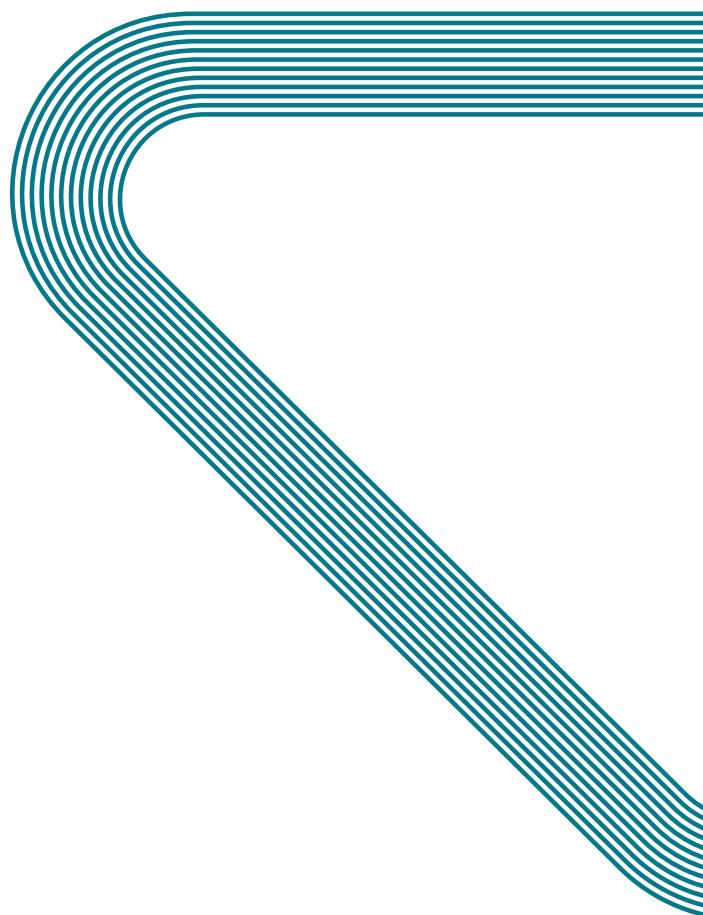
126 For instance, Malta and the Netherlands promote digital integration through mentorships and institutional initiatives. However, implementation across countries remains uneven. See the [2023 Eurydice system-level indicators](#) on digital competence at school.

127 See the [2023 Eurydice system-level indicators](#) on digital competence at school.



digital contents, tools and risks such as cyberbullying. According to the OECD<sup>128</sup>, while many teachers participate in such training, learning activities are often short in duration — typically under four days over a period of two years — and mainly focus on basic digital skills<sup>129</sup>. More effective continuing professional development is characterised by sustained, content-rich, and collaborative formats. International platforms, such as MOOCs (massive online open

courses) and online communities (eTwinning, NAU, IMooX), increasingly support teacher development, but significant disparities persist in participation and impact, particularly between socio-economically advantaged and disadvantaged schools. Moreover, teachers in vocational education and training participate less in digital skills training than other teaching professionals<sup>130</sup>.



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- 128 According to the OECD Teaching and Learning International Survey (TALIS) 2018, 60% of lower-secondary teachers across OECD education systems reported have taken part in professional development activities covering ICT skills for teaching over the past 12 months. See a [2025 OECD policy paper](#) on preparing teachers for digital education.
- 129 Training frequently emphasises basic software, such as word processing and presentations, while more advanced tools such as coding environments, simulations, or concept-mapping platforms are less commonly used. This imbalance can undermine the effective integration of digital tools in classrooms. ICILS 2023 data show that regular use of general ICT applications (e.g. spreadsheets and text editing) is positively associated with student performance in digital skills. In contrast, the use of more specialised tools does not consistently lead to higher achievement and may reflect their application in remedial contexts.
- 130 See a [2025 Cedefop report](#) on digital skills policy in VET.

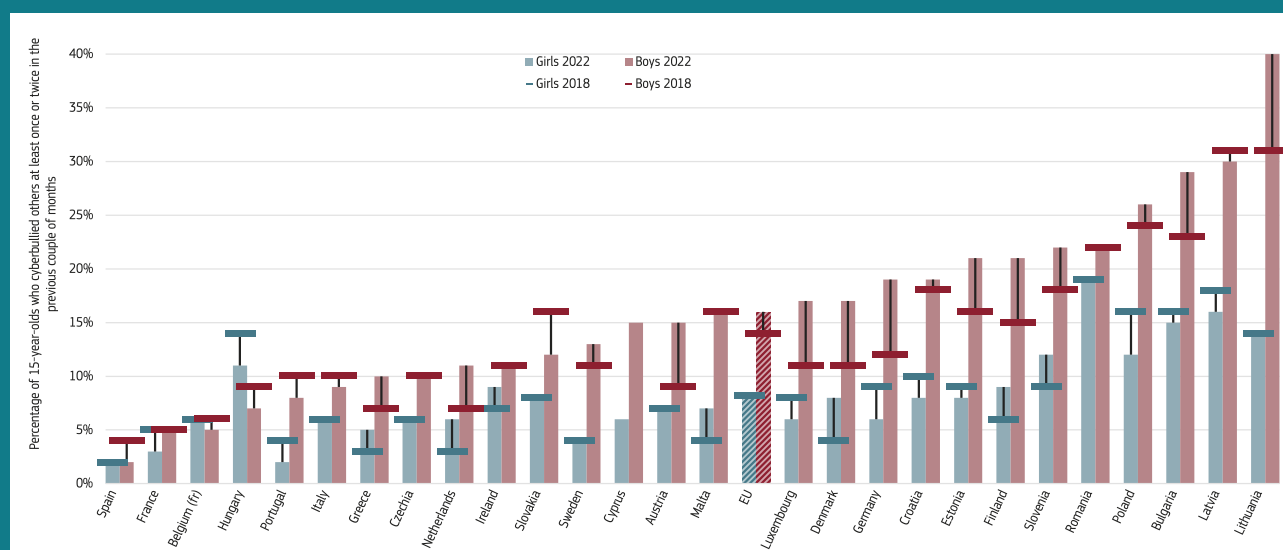
## Box 6. Cyberbullying on the rise

Young people are increasingly exposed to environments characterised by technology and online communication. The rapid evolution and update of digital technologies (such as generative AI) is giving rise to new kinds of behaviours that pose challenges in defining, identifying and addressing cyberbullying.<sup>131</sup> Cyberbullying<sup>132</sup> may have a large impact on student wellbeing, significantly affecting learners' health and academic achievement and may cause the student to decide to leave school early. Effectively addressing cyberbullying in schools requires a coordinated, multi-stakeholder approach that prioritises prevention, ensures robust support mechanisms, and fosters a strong sense of community.<sup>133</sup>

The Progress in International Reading Literacy Study (PIRLS) 2021 asked children in the fourth year of primary education two specific questions about cyberbullying: how often in the previous year had other students from the same school: 1) sent the child nasty or hurtful messages online; and, 2) shared nasty or harmful information about the child online. Given that the surveyed children were very young as most fourth-grade students are 9-11 years old, PIRLS findings appear worrying. In all 24 EU education systems participating in the study except France, more than one in ten students received nasty or harmful messages online at least a few times a year; in nine education systems this happened to more than one in five students. In 11 EU education systems, more than one in ten students were the target of nasty or harmful information shared online at least a few times a year. Children who had suffered cyberbullying usually performed worse in reading than those who had not.<sup>134</sup>

The Health Behaviour in School-aged Children (HBSC) study by the World Health Organization (WHO), conducted every four years using self-reported questionnaires, focuses on the health and wellbeing of young people worldwide (aged 11/13/15 years). Its goal is to examine adolescent health in its social context to better understand societal influences on health. Figure 9 shows the change between 2018 and 2022 in the share of 15-year-olds who reported that they take part in cyberbullying others by sending mean instant messages, wall postings or emails, posting/sharing photos or videos online without permission. Most EU countries have experienced increases, especially among boys while girls generally report lower participation in cyberbullying.

Figure 9. **The proportion of 15-year-old boys who cyberbully others is on the rise (2018-2022)**



Source: HBSC (2022) Download data [Monitor Toolbox](#)

Note: Cyprus did not participate in HBSC 2018. Countries shown in ascending order based on the share for boys in 2022.

However, as this is a self-reported survey, there are quite a few caveats to be taken into account. Social image and embarrassment might lead participants to underreport their actual participation in cyberbullying. There may be an imbalance in international comparisons caused by different levels of awareness of the issue: young people may not always identify bullying as such but see it as 'fun' or 'jokes'.<sup>135</sup> Thus, the results in countries with higher proportions might also reflect greater sensitivity to the issue.

131 See a [2025 European Commission \(Joint Research Centre\) report](#) on cyberbullying.

132 Cyberbullying takes four main forms: i) written/verbal through phone-calls, texts, email, chats, blogs, and posts on social media; ii) visual through posting compromising or humiliating photos or videos; iii) exclusion by intentionally excluding a person from a group; and, iv) impersonation by using another person's account details to cause harm. See the 2022 [Commission staff working document](#), accompanying the initiative 'Pathways to school success'.

133 See the [2024 Guidelines on wellbeing and mental health at school](#).

134 For more information, see the 2023 [European Commission report on PIRLS 2021 in the EU](#).

135 See the 2022 [Commission staff working document](#), accompanying the initiative 'Pathways to school success'.

## 2.3. Civic knowledge



Suggested EU-level 2030 target<sup>136</sup>:  
**'By 2030, the share of adequate performance in civic knowledge should be at least 85%.'**

Our democracies are increasingly shaped by rapid geopolitical, economic, technological, social, and cultural changes, exacerbated by the urgent demands of sustainable development and climate resilience. There are growing concerns over political and social polarisation, detachment from democratic institutions and their participatory processes. The increasing spread of misinformation and disinformation, often linked to foreign information manipulation and interference activities, particularly online, further undermines trust in democratic institutions and weakens informed civic participation.

Education plays a central role in helping young people become active, engaged, and responsible citizens, giving them the knowledge, skills, and attitudes needed to take part in democratic life, contribute to society, and support fairness, inclusion, and human rights. Accordingly, the Council and the European Parliament have highlighted the importance of citizenship education.<sup>137</sup>

The [Action Plan on Basic Skills](#) includes citizenship and civic knowledge<sup>138</sup> among the basic skills, on a par with literacy, numeracy, science and digital skills. In the [interim evaluation of the European Education Area](#), the European Commission suggested that the Council might consider addressing citizenship education as a strategic priority, supported by a EU-level target.

The suggested target aims for at least 85% of 8<sup>th</sup> grade students (13-14 years-old) in general school education to demonstrate an adequate level of civic knowledge<sup>139</sup>, as measured by the International Civic and Citizenship education Study (ICCS)<sup>140</sup>. The survey assesses students' understanding of civic and citizenship concepts and institutions, as well as the cognitive skills needed to analyse and apply this knowledge when reasoning about civic and political issues and for an informed and active participation in society. Students with an adequate level of civic knowledge demonstrate understanding of democratic principles, civic responsibilities, global citizenship, and the roles of key institutions, while recognizing risks such as government-controlled media and challenges linked to globalization and environmental protection<sup>141</sup>. In 2022, the EU average<sup>142</sup> reaching an adequate level of civic knowledge stood at 63.2%. Figure 10 shows a high variability across countries: some report over 70% of students reaching this level, others remain below 50%, underscoring the need for targeted policy efforts.

<sup>136</sup> See the [Interim evaluation of the 2021-2030 European Area Strategic framework](#).

<sup>137</sup> See: the 2022 European Parliament Resolution on the implementation of citizenship education actions; the 2023 Council conclusions on the contribution of education and training to strengthening common European values and democratic citizenship; the 2025 [Conclusions of the Council and of the Representatives of the Governments of the Member States meeting within the Council on a community of young people in Europe based on European values for a common and safe Europe](#).

<sup>138</sup> Defining civic knowledge is a challenging task as it encompasses learning outcomes including attitudes, behaviours, and participation. Likewise, a wide array of interchangeable terms are used to define citizenship education across education systems and sometimes even within countries and education systems. The goals and contents also vary greatly across countries. For more information, see [the 2025 OECD report](#) on civic education.

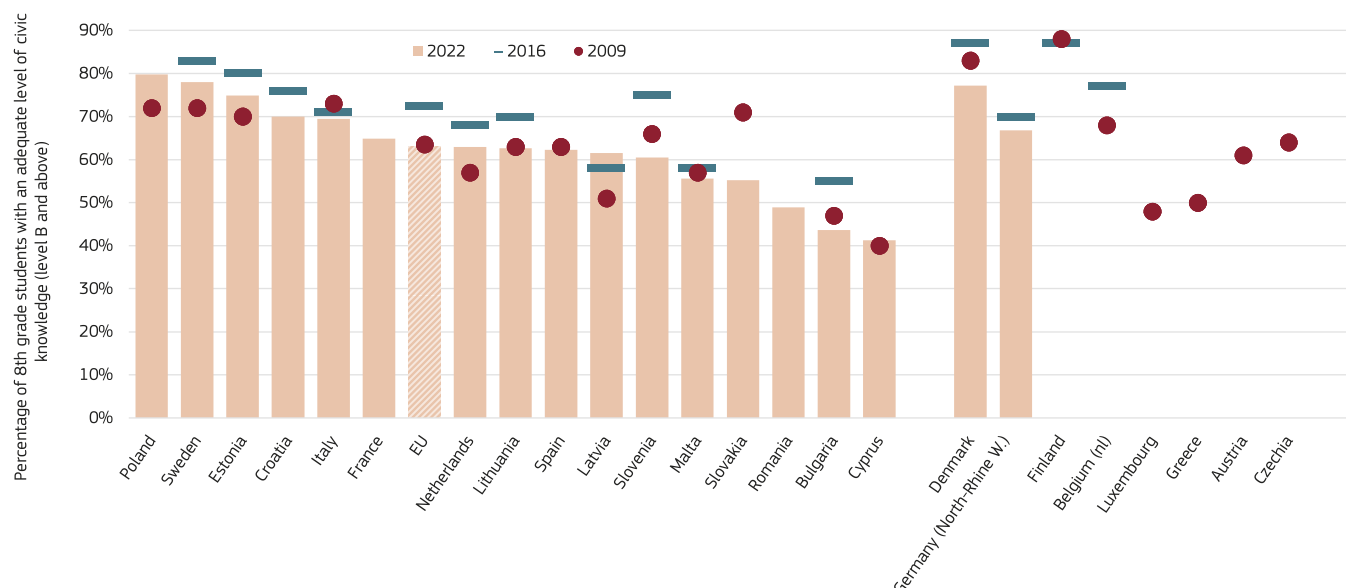
<sup>139</sup> This indicator captures the share of eighth graders (age 13-14) reaching at least competence level B. Students reaching at least this level are considered to have an adequate level of civic knowledge. [Monitor Toolbox](#)

<sup>140</sup> ICCS, conducted by the International Association for the Evaluation of Educational Achievement (IEA) in 2009, 2016, and 2022, and scheduled again for 2027, has included nearly all EU Member States. All have participated in at least one cycle, with the exception of Hungary, while Portugal is set to join for the first time in 2027.

<sup>141</sup> More specifically, students at this level are able to: i) relate the independence of a statutory authority to maintenance of public trust in decisions made by the authority; ii) relate the economic risk to developing countries of globalisation from a local context; iii) understand that informed citizens are better able to make decisions when voting in elections; iv) understand that responsibility to vote is aligned with democratic representation; v) describe the main role of a legislature/parliament; vi) identify environmental and social motivations associated with ethical consumption; vii) describe the main role of a constitution; viii) recognise the relationship between the government and the military in a democracy; ix) identify behaviour consistent with identification as a global citizen; x) recognise the danger of government-controlled media; and xi) relate the responsibility for environmental protection to the actions of individual people.

<sup>142</sup> The EU average is calculated as the arithmetic average of the participants in the 2022 cycle: Bulgaria, Denmark, Germany (North-Rhine W.), Estonia, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Malta, Netherlands, Poland, Romania, Slovenia, Slovakia, Sweden.

**Figure 10. Almost two thirds of students know about and understand the most pervasive civic and citizenship institutions, systems and concepts**



Source: IEA (ICCS). [Download data](#) [Monitor Toolbox](#)

Note: The indicator captures the share of eighth graders (age 13-14) reaching at least competence level B. The EU average is calculated as the arithmetic average of all the participants shown in the figure. Caution is required when interpreting data for Denmark in 2022, because sampling participation requirements were not met. Countries are shown in descending order based on 2022 values.

The most striking disparities are often found within countries rather than between countries, highlighting that civic knowledge is strongly linked to students' socioeconomic background. As for other basic skills, those from more affluent families consistently outperform their peers. Beyond socioeconomic status, other background characteristics contribute to unequal outcomes. In all participating Member States, girls outperform boys. Students who speak the language of schooling at home tend to perform better, pointing to the influence of language proficiency and varying levels of educational support. Such disparities have clear implications with regard to equity and social cohesion.

Across countries, higher levels of civic knowledge tend to be positively associated with a range of civic and citizenship outcomes, including self-efficacy, engagement, attitudes, and values. Students with higher civic knowledge tend to talk more often about civic and political issues outside of school. These students are also less likely to rely on social media or online platforms, when engaging with civic or social issues. This is especially important given the growing concerns about misinformation, disinformation online and foreign information manipulation and interference threats. The picture is more mixed when it comes to expectations of active political and social involvement. In nearly half of the countries, students with higher civic knowledge are consistently more willing to express their views through legal means, peaceful protests,

or environmental actions. They are also more likely to see themselves as active participants in society when they grow up. However, in some countries, students with lower civic knowledge are actually more likely to join political parties, attend demonstrations, or support campaigns.

In addition to actual or potential participation, civic knowledge shapes how young people perceive democratic institutions. In nearly all countries, students with an adequate level of civic knowledge report greater awareness of the functioning of democratic institutions and better understanding of the factors that may undermine democratic systems. On average, they score 7 points higher than their peers with lower civic knowledge in the ICCS test. The most notable differences are observed in Sweden (+10 points), followed by Poland, Italy, the Netherlands, and Estonia (+8 points each). Civic knowledge and trust in government are also closely related. While in some countries, such as the Netherlands, Sweden, and Estonia, students with higher civic knowledge express more trust, in several other countries, including Bulgaria, Italy, Malta, and Romania, they report lower levels of trust. This finding should be viewed in the broader context of lower trust in government among younger generations compared to those over 50<sup>143</sup>, as highlighted in [2024 OECD report](#).

ICCS also shows that students with higher civic knowledge also express stronger commitment to civic values, including

gender equality (+10 points), equal rights for ethnic groups (+7 points) and more positive attitudes toward migrants (+4 points). Students with higher civic knowledge display greater concern about environmental issues and the global dimension

of citizenship, which would suggest that civic knowledge is a key entry point for preparing citizens who are committed to addressing global challenges, including climate change.

### Box 7. Promoting civic knowledge at school

International research reveals a number of effective strategies for improving civic knowledge. One of the most widely supported is fostering an open classroom environment, where students are encouraged to discuss political and social issues in a respectful manner. Teachers who give students a say, and encourage dialogue and inclusive debate help build both civic understanding and participatory skills, which are closely linked to better civic knowledge and more positive democratic attitudes.

It is equally important to incorporate civic education across subjects and school life. While dedicated civic education remains essential, integrating civic themes into subjects such as history, languages and social sciences broadens opportunities for learning. In addition, hands-on experiences such as taking part in school councils, organising community projects, and holding mock elections allow students to apply what they have learned in real-life settings. These practical activities help deepen their understanding of democratic processes and increase their motivation and confidence when it comes to taking an active part in civic life.<sup>144</sup> Moreover, strengthening teacher capacity, adapting curricula to emerging civic issues, and supporting whole-school approaches will be vital to sustaining and enhancing the impact of citizenship education in the years to come.

### Main takeaway

The European Commission's Action Plan on Basic Skills reinforces the basic skills framework by extending the concept of basic skills to digital and citizenship skills. With the aim of boosting Europe's competitiveness and preparedness, the Union of Skills proposes 2030 EU-level targets for top performance in reading, mathematics and science while integrating digital skills and citizenship. A closer look at mathematics reveals drivers of recent performance drops such as digital distractions, shortages of teachers and waning parental involvement. Meanwhile, no less than 42.5% of students score below the minimum proficiency threshold in computer and information literacy, driven by inequality in access and insufficient teacher capacity. An adequate level of civic knowledge is attained by 63.1% of students and goes hand in hand with more positive civic attitudes and greater engagement.

144 See for example the Danish, Swedish and Portuguese experience in [OECD \(2024\)](#)





## CHAPTER 3. EARLY CHILDHOOD EDUCATION AND CARE

Early childhood education and care (ECEC) can contribute significantly to children's development by laying the foundation for future development and learning. The returns to education are highest for investment in ECEC, especially for disadvantaged children, and subsequently decrease with age<sup>145</sup>. However, while the 'skill begets skill'<sup>146</sup> theory argues for an early start in ECEC, research reveals that the impact of early enrolment is closely linked to the quality of provision<sup>147</sup>. High-quality ECEC helps tackle underachievement in basic skills by allowing for an early identification of learning difficulties and a strong start towards future development. The lifetime benefits of high-quality ECEC include higher earnings, long-term individual wellbeing<sup>148</sup>, lower risk of poverty and early school leaving, and better health. In addition, ECEC provision enables better labour market participation of mothers and single parents, thus reducing the risk of child poverty<sup>149</sup>. Against this backdrop, this chapter looks at latest participation data and how to increase and maintain the quality of ECEC provision.

### 3.1. Broadening participation



EU-level 2030 target<sup>150</sup>:

**'At least 96% of children between 3 years old and the starting age for compulsory primary education should participate in early childhood education and care by 2030.'**



EU-level 2030 target<sup>151</sup>:

**'At least 45% of children below the age of 3 should participate in formal childcare or education.'**

145 Later investment remains important to ensure that the steps taken in early childhood translate into benefits in the long run. Investment in ECEC and other forms of education can be considered complementary and intrinsically linked. The positive effects of participation in ECEC tend to persist when ECEC programmes target more than just basic numeracy and reading skills, but there is an alignment between ECEC programmes, primary schooling and secondary schooling. For an overview of the literature, see a [2018 EENEE report](#) on the benefits of ECEC.

146 See a [2025 OECD report](#) on reducing inequalities investing in ECEC.

147 There is evidence that enrolment in ECEC at age two or three is beneficial for children, whereas results are more mixed for younger children. See a [2025 OECD report](#) on reducing inequalities in investing in ECEC.

148 See [the 2025 Council Conclusion](#) on inclusive, learner-centred practices in ECEC and school education.

149 For more details, see the [2024 Commission report](#) on employment and social developments in Europe. Moreover, a [2018 EENEE report](#) acknowledges the associated societal benefits of ECEC.

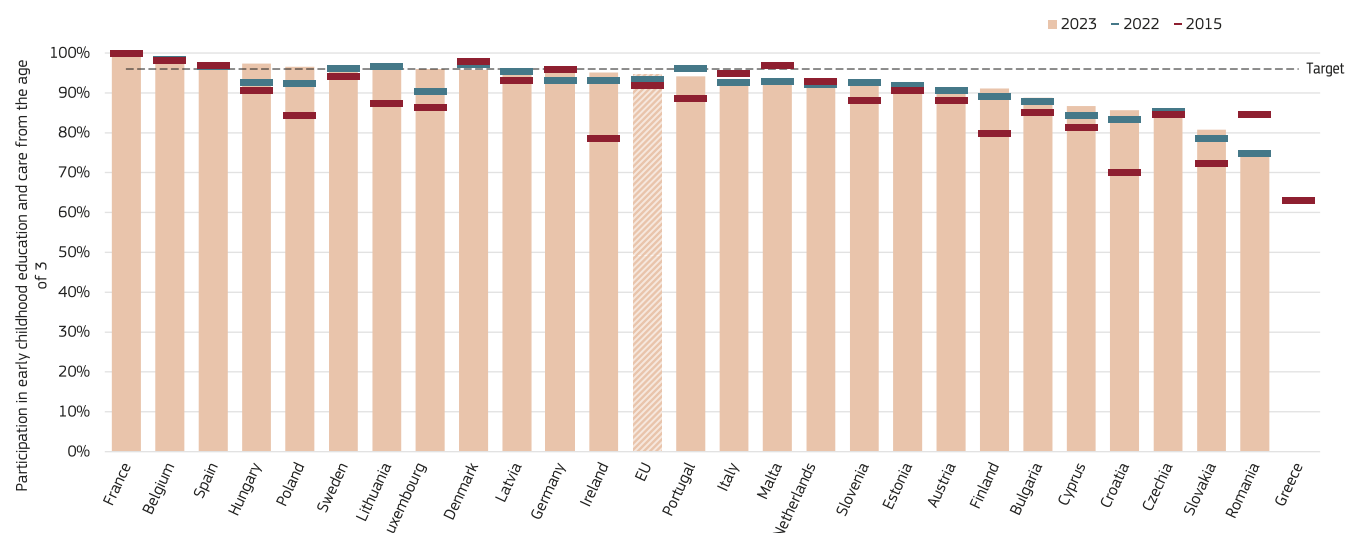
150 Originating in [2021 EFA strategic framework Resolution](#).

151 Originating in the [2022 Council Recommendation](#) on early childhood education and care: the Barcelona targets for 2030, as part of the larger [European Care Strategy](#). This target is accompanied by specific targets for those countries that did not reach the EU-level targets set in 2002. These countries should increase participation in relation to their respective participation rates as follows: (i) by at least 90% for EU countries whose participation rate was under 20%; or (ii) by at least 45%, or until they reach a participation rate of at least 45%, for EU countries whose participation rate was between 20% and 33%. The participation rate used as a baseline was calculated as the 2017–2021 average participation rate in formal childcare or education of children under the age of three.

The participation in ECEC of children between the age of three and the starting age for compulsory primary education continues to increase in the EU. The rate stood at 94.6% in 2023, 1.4 percentage points lower than the 2030 EU-level target. To date, eight EU countries have reached the 96% target set at EU level for this age group, while most top

90%<sup>152</sup>. The best-performing countries are France (100%), Belgium (98%) and Spain (97.7%), whereas Romania (75.7%), Slovakia (80.8%) and Czechia (85.3%) are at the bottom (Figure 11). The EU average increased by 1.3 percentage points from the previous year, even though there was a decrease in five countries<sup>153</sup> between 2022 and 2023.

Figure 11. Most of EU countries have participation above 90%



Source: Eurostat (UOE joint data collection). [Download data](#) [Monitor Toolbox](#)

Note: The upper limit of the age bracket is defined by the country's starting age for compulsory primary education. The definition differs in Belgium (2015), Greece (2015) and Portugal. Provisional data for France (2022, 2023). Break in time series Belgium (2017), Hungary (2023), and Portugal (2022). Countries are shown in descending order based on 2023 data. Data for Greece in 2022 and 2023 are not available.

Since 2015 participation across the EU has broadened by 2.7 percentage points and most countries have recorded growing rates in the last decade<sup>154</sup>. This trend is part of a broader convergence process<sup>155</sup> as increasing participation has been a priority in many EU countries. In the past few years alone, various national reforms have made participation mandatory – especially for older children – or have introduced legal

entitlement to ECEC. At the same time, investment<sup>156</sup> in infrastructure has increased the number of places available<sup>157</sup>. Substantial improvements of more than 10 percentage points have been recorded in Ireland, Luxembourg, Croatia, Poland, Finland, Lithuania and Hungary, driven by a significant rise in the participation of 3-year-olds<sup>158</sup>.

152 However, regional and territorial disparities in participation persist. Moreover, marked differences in the intensity of participation between countries also exist as suggested by EUSILC. [Monitor Toolbox](#)

153 Portugal (-2.1 percentage points), Denmark (-1.4), Estonia (-0.7), Lithuania (-0.5) and Belgium (-0.4). [Monitor Toolbox](#)

154 However, Romania (-8.9 percentage points), Malta (-3.7), Denmark (-2.3), Italy (-1.4), Germany (-0.7) and Belgium (-0.2) have seen a decline in participation. [Monitor Toolbox](#)

155 The positive trend of the *dispersion index* suggests upward convergence (see the 2024 Education and Training Monitor's [comparative report](#)). The results from a beta convergence analysis using Eurofound's online [convergEU app](#) over the period 2014–2023 confirm that the worst-performing countries are catching up.

156 For instance, about EUR 1 billion of the European Regional Development Fund (including Interreg) resources has been allocated to ECEC infrastructure and equipment in the Cohesion Policy programmes in the period 2021–2027, in close cooperation with human capital investments under the European Social Fund Plus (ESF+). Moreover, investing in the availability, quality and affordability of ECEC holds a prominent position in the Recovery and Resilience Facility, with about EUR 7 billion allocated to the sector. This figure corresponds to the estimated cost of RRF measures allocated to the policy area 'early childhood education' either as primary or secondary assignment, according to the pillar tagging methodology. For further information, see the [Recovery and Resilience Scoreboard](#) online.

157 However, a major obstacle to the expansion of ECEC provision is the lack of staff. For more country-specific information, see the [country reports](#).

158 Participation of 3-year-olds increased in Ireland (+50.7 percentage points), Luxembourg (+25.2), Croatia (+19.5), Poland (+19.4), Finland (+17.7), Lithuania (+17.4) and Hungary (+15.6). [Monitor Toolbox](#) The substantial increase in Ireland can be associated with the creation of the Early Childhood Care and Education (ECCE) programme, which has been providing public funding for children aged 2 years and 8 months to 5 years and 6 months to attend preschool. For more information, see the 2025 Education and Training Monitor's country report for [Ireland](#) and the [2021 OECD report](#) on strengthening ECEC in Ireland. Luxembourg's result is driven by the 2022–2023 change (+20.2) due to the fact that more ECEC programmes are now classified as formal education than before.

Progress has been made in almost all EU countries<sup>159</sup> in terms of increasing participation among 3-year-olds and at European level, reaching 90.3% in 2023 (+4 percentage points since 2015). Yet in some countries, the challenge

remains to increase participation among 3-year-olds with rates particularly low in Romania (68.1%) and Slovakia (68.9%)<sup>160</sup>.

### Box 8. Early literacy development

Children's literacy development begins from birth. ECEC contributes to children's reading and language skills by providing structured yet flexible learning experiences that incorporate play, storytelling and social interaction. High-quality ECEC professionals are crucial in providing support for children's development and learning<sup>161</sup>. The role of the family in early literacy development is also key to ensuring that children receive consistent support both in kindergartens and at home. Home book schemes can strengthen parental involvement<sup>162</sup> and help children acquire strong literacy skills, and establish a reading culture in the family. However, the actual uptake and impact of family literacy initiatives may vary depending on contextual factors such as parental engagement, time availability and familiarity with school expectations.

There are interesting examples of home book schemes across EU countries. Babies born in Estonia are given a book called *Pisike puu* ('tiny tree') to support the family's interest in reading and promote Estonian children's literature. In the Netherlands, 'BookStart' focuses on early childhood literacy, offering free book packages to new parents and promoting early reading routines. Public libraries work together with health centres to distribute materials and provide guidance to parents on developing reading habits at home. In Finland, every newborn baby receives a book bag as a gift. The aim is to encourage parents to read aloud to small children. The Croatian 'Born to read' programme promotes early childhood reading by having paediatricians read to children and provide parents with books to encourage reading at home.

Among children aged 0 to 2, attendance rates are still substantially lower. In 2024, an average of just 39.3%<sup>163</sup> of children under the age of three were enrolled in formal childcare or education on average. As shown in Figure 12, there are significant differences between countries, with rates ranging from just 5.1% in Slovakia to 78.9% in the Netherlands. Although the average remains 5.7 percentage points below the 2030 EU-level target of at least 45%, it has risen by 1.9 percentage points since 2023 and by 9.3 points since 2015. Several countries have made notable progress between 2015 and 2024, with increases exceeding 15 percentage points in the Netherlands (32.6), Lithuania (27.2), Malta (25.1), Cyprus (21.1), Slovenia (20.4), Croatia (18.4), Finland (17.8), France (17.6), Greece (17.5), Portugal (16.4), Estonia (15.3), and Spain (15.3).

159 A decrease has been recorded in Romania (-9.7 percentage points), Czechia (-3.1), Denmark (-2.3), Germany (-1.6), Italy (-1.4), Malta (-0.8) and Belgium (-0.5) **Monitor Toolbox**

160 Low participation rates can also be attributed to a lack of infrastructure. Other factors include parental background, financial and material means, other households' characteristics, low level of trust in provision quality and parents' attitudes towards ECEC.

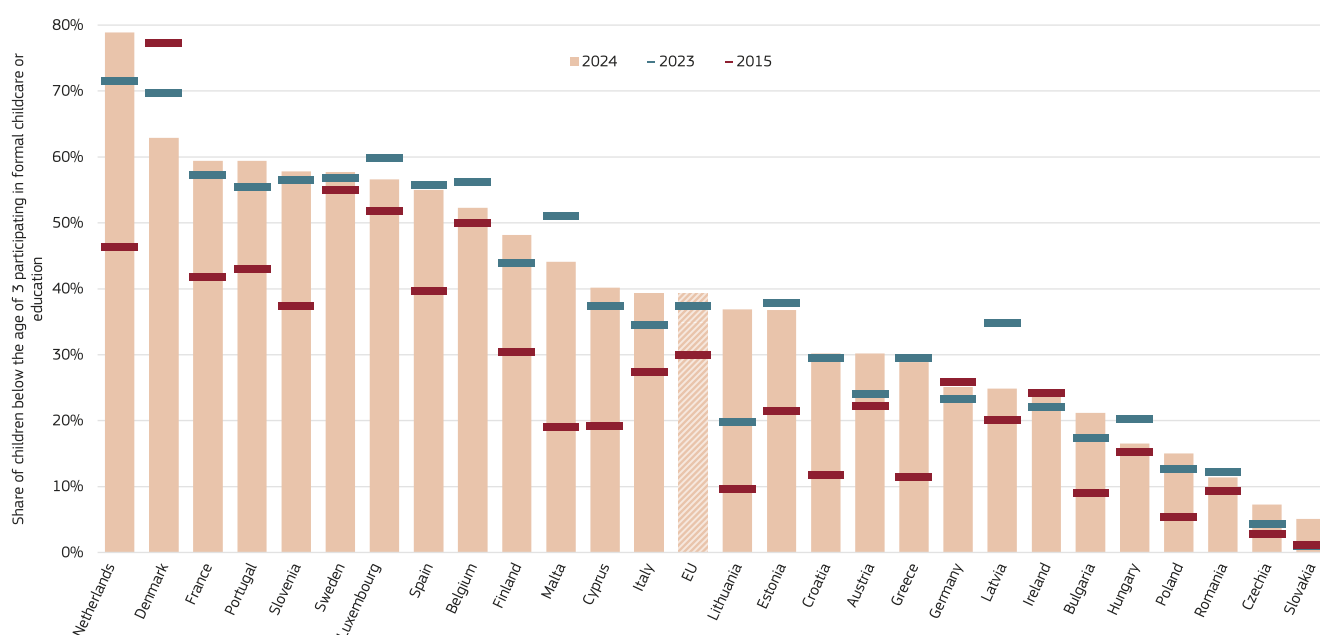
161 For more information, see the 2020 [OECD report](#) on building a high-quality ECEC workforce.

162 Parental involvement and participation are an essential factor in high-quality ECEC provision. Parents can receive support in the form of, for example, information sessions, parenting programmes, home-learning guidance and home visits. For more information, see the [2025 Eurydice report](#) on key data on ECEC in Europe.

163 28.2% participated at least 25 hours per week. **Monitor Toolbox**



Figure 12. Participation in formal childcare or education has increased substantially in the past decade



Source: Eurostat (EU Survey on Income and Living Conditions). [Download data](#) [Monitor Toolbox](#)

Note: Break in time series in Belgium (2019), Denmark (2023), France and Luxembourg (2020, 2022), Germany (2020) and Ireland (2019, 2020). Data are provisional for Lithuania (2024). Countries are shown in descending order based on 2024 data.

Promoting equitable access to ECEC is key to preventing the snowballing effects of socio-economic and migrant<sup>164</sup> background (see [Section 4.2](#)). In almost all EU countries, children at risk of poverty or social exclusion are less likely to attend formal childcare or education than their more advantaged peers. In 2024, the participation rate for children below the age of 3 who are at risk of poverty or social exclusion<sup>165</sup> was 24.4%<sup>166</sup>, compared to 42.5% for those not at risk. This gap exceeds 25 percentage points in several countries — most notably in France (38.4 percentage points), the Netherlands (33.9), Malta (31.0), and Belgium (27.7).

Between 2016 and 2024, most EU countries succeeded in increasing the participation among vulnerable children, but only a few<sup>167</sup> managed to close the gap<sup>168</sup> (Figure 14). In fact, the gap grew on average 4.5 percentage points between 2016 and 2024, reaching 18.1 percentage points in 2024<sup>169</sup>. The gap increased by more than 10 percentage points in Croatia, Ireland, Luxembourg, Malta, Cyprus, France, and Greece. Nonetheless, despite the persistent gap, the level of participation of disadvantaged children in 2024 exceeded 40% in seven EU countries<sup>170</sup>.

164 Children from migrant backgrounds are among those who benefit most from attending high-quality ECEC. Supporting the language development of children whose first language differs from the language of the service is crucial. However, this support is rare within the EU. Moreover, the children targeted by these measures vary across countries and the regulations and recommendations governing structured measures to support children in acquiring the language of the ECEC service differ significantly in scope and precision. For further detail, see the [2025 Eurydice report](#) on key data on ECEC in Europe.

165 For the purpose of this analysis, the value for the indicator in year  $t$  has been averaged with the value for year  $t-1$ , when available, to reduce the volatility, in consistency with the methodology used in [monitoring framework](#) for the European Child Guarantee. This methodology is applied to participation gaps and trend analysis in this section.

166 Albeit with substantial heterogeneity, as the rate ranges from less than 5% in Slovakia, Poland and Czechia to more than 50% in Denmark and Sweden. [Monitor Toolbox](#)

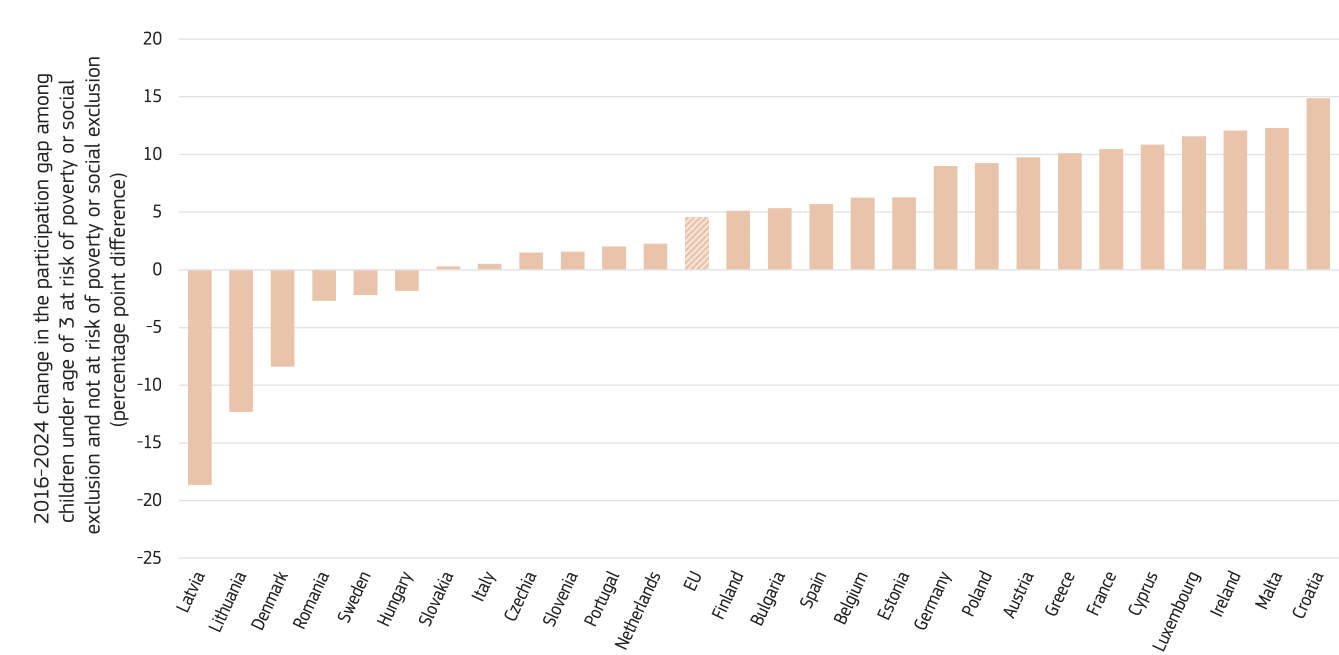
167 Notably Latvia (-18.9 percentage points), Lithuania (-12.4) and Denmark (-8.2). At the same time, looking at the children aged 3 and above, nine EU countries recorded a decrease in the participation gap (of over 15 percentage points in Lithuania, around ten in Bulgaria and Latvia and seven in Croatia). [Monitor Toolbox](#)

168 The 2022 Council Recommendation on early childhood education and care further recommends reducing the participation gap in ECEC between children at risk of poverty or social exclusion and those from more advantaged backgrounds.

169 Reaching 18.1 percentage points in 2024. This contrasts with the trends recorded for the children aged three and over, for whom the participation gap by poverty or social exclusion remained stable between 2016 and 2024, standing at eight percentage points. [Monitor Toolbox](#)

170 Denmark (69.6%), Sweden (56.9%), Portugal (45.6%), the Netherlands (45.2%), Spain (42.6%), and Luxembourg (42.3%). [Monitor Toolbox](#)

Figure 13. Inequalities have grown in participation in formal childcare or education



Source: Eurostat (EU Survey on Income and Living Conditions). [Download data](#) [Monitor Toolbox](#)

Note: Two-year averages (reference year and reference year-1) have been used to reduce the volatility of the indicator, when available; break in time series for Belgium (2019), Denmark (2023), Germany (2020), Ireland (2019, 2020), France (2020), Cyprus (2024) and Luxembourg (2020); data are provisional for Lithuania (2024).



## Box 9. Increasing participation in ECEC<sup>171</sup>

Limited availability of ECEC places, especially in disadvantaged areas, remains the primary barrier to participation in most EU countries. The poor quality of available places and administrative hurdles, such as complex enrolment procedures, can further restrict access. Allocation rules that prioritise working parents may limit opportunities for disadvantaged families and newly arrived migrants.

On the demand side, high costs represent a major barrier preventing disadvantaged families from accessing ECEC, especially for children under three years old, as provision costs tend to be higher and free access is less common compared with pre-primary education from the age of three. Family policies, such as home-care benefits, can further discourage participation in ECEC. Limited trust in formal ECEC services, due to cultural factors, perceptions of poor quality, and limited awareness of their benefits, may also deter parents from enrolling their children.

Access can be supported by guaranteeing a legal entitlement or by prioritising disadvantaged children where demand exceeds supply. Financial barriers can be reduced through free provision, income-based fee reductions and subsidies for meals and transport. These measures are most effective when easily accessible, regardless of parental employment, and aligned with family policies, such as parental leave.

Ensuring high-quality of ECEC can encourage families to take up available places. Factors such as lower child-to-staff ratios, better staff qualifications and training, particularly for working with children with disabilities, together with inclusive curricula, and quality assurance, help build trust. Outreach strategies further raise awareness among families less familiar with formal care. Low-threshold services like toy libraries or playgroups can serve as entry points. Flexible provision, including part-time options and extended hours, increases accessibility for families with diverse needs.

Several EU countries have introduced promising initiatives to reduce participation gaps in ECEC. Romania is expanding the supply of ECEC places in underserved areas by establishing complementary ECEC services in disadvantaged communities, funded by the Recovery and Resilience Facility (RRF). In Cyprus, a reform supported by the RRF will lower the compulsory entry age to 4, addressing low awareness and late enrolment.

Additionally, public grants are available to cover tuition fees in community kindergartens when public provision is full – reducing financial barriers and expanding access in areas with limited supply. In Slovenia, shorter programmes create entry points to increase familiarity with ECEC. Recently proposed amendments to the Kindergartens Act promote the inclusion of Roma children and envisage additional measures if a child does not attend kindergarten despite the recommendation of the Centre for Social Work. Ireland's 2024 Equal Start initiative combines universal and targeted approaches by prioritising funding for children in disadvantaged areas, supporting, in particular, Traveller children, Roma children, children availing of the National Childcare Scheme, children experiencing homelessness and children in the International Protection system. This includes additional staff hours for family support and professional development, improving quality and responsiveness, while strengthening trust and engagement with families who may be less familiar with formal care. In Portugal, the 'Creche Feliz' (Happy Childcare) programme has made daycare free of charge for children under three.<sup>172</sup>

## 3.2. Ensuring quality through monitoring and evaluation

Evaluation and monitoring systems offer the opportunity to achieve, maintain or develop high quality provision of ECEC. Such systems help identify strengths and weaknesses, which can then be built upon or remedied. Evaluation and monitoring in ECEC serves a number of purposes, such as increasing efficient resource allocation and informing actions for improvement, including in equity and inclusion. Monitoring systems can also provide information to help families make choices between a range of local ECEC services and address potential barriers to attendance. If ECEC is perceived as safe, nurturing and supportive, it may alleviate parental concerns about leaving their children, especially those very small.

External evaluation<sup>173</sup> of ECEC settings is a quality-control process aimed at assessing the performance of individual settings, reporting on the quality of services provided and recommending improvements to practices. Two key dimensions of quality can be distinguished and evaluated: structural quality and process quality at the level of each setting. Structural quality focuses on the conditions of daily operations and is assessed by checking compliance with regulations and guidelines on factors such as staff qualifications, group sizes and health and safety standards. Process quality refers to how effectively the setting fosters children's holistic development, wellbeing and learning through interactions and experiences with staff and peers. This dimension includes the educational aspects, such as how the curriculum and pedagogy are implemented in practice. Process quality is a significant predictor of children's

171 See the [2025 ENESET ad hoc report](#) on Increasing Participation in Early Childhood Education and Care in Europe; and a [2025 OECD report](#) on reducing inequalities investing in ECEC.

172 For more details about national developments, see the 2025 Education and Training Monitor's country reports for [Romania](#), [Cyprus](#), [Ireland](#), and [Portugal](#).

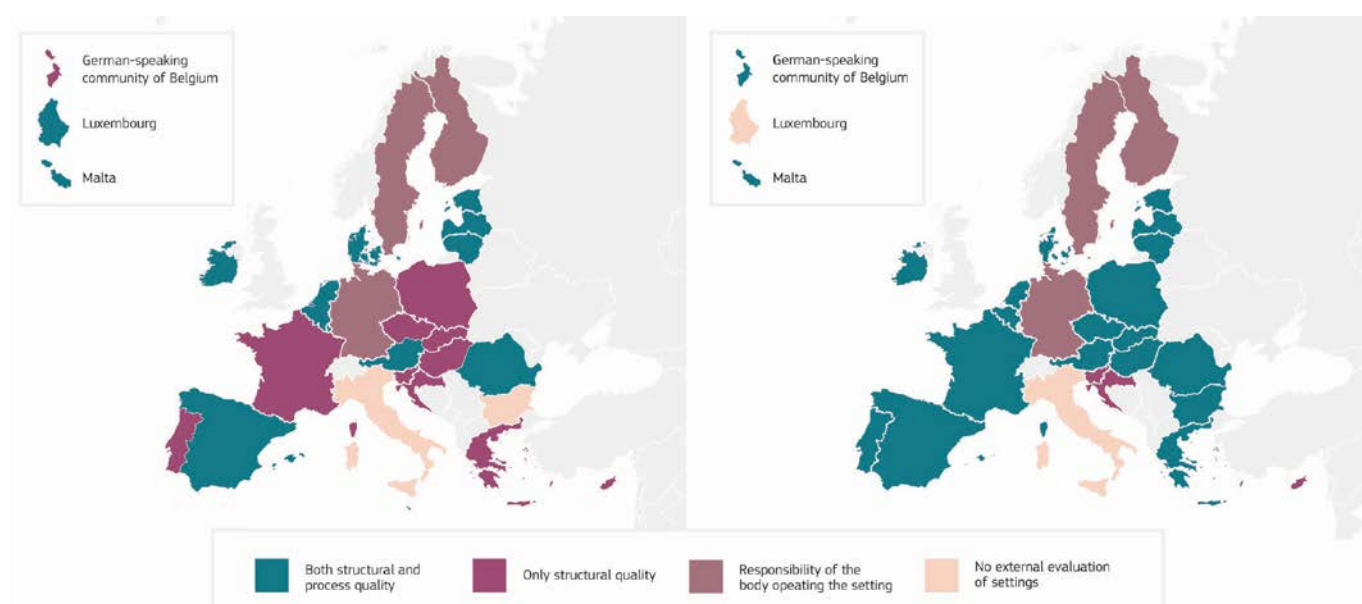
173 Another key component of quality assurance is internal evaluation performed by staff members of the setting. Evaluation outputs may include a self-evaluation report, an annual activity report, a development plan or a revised pedagogical plan. Not all EU countries have regulations or recommendations on internal evaluation of ECEC settings. In some countries, a framework exists only for older children. For more details, see the [2025 Eurydice report](#) on key data on ECEC in Europe.

development and learning. Research indicates that children in ECEC settings with more positive staff-child interactions and higher-quality exposure to developmental and educational activities tend to have better emerging literacy and numeracy skills, as well as improved behavioural and social skills<sup>174</sup>.

Figure 14 shows that in slightly over one-third of all EU education systems, external evaluations of the individual ECEC settings for younger children focus solely on structural quality, whereas those for older children's settings tend to include process quality more commonly. Only in Croatia, Cyprus and Slovenia, does the regulation on evaluation

address structural quality without taking into account the quality of educational processes or interactions for both age groups. In a few EU countries, however, there are no regulations on evaluation (Italy for the entire period, Bulgaria for younger children and Luxembourg for pre-primary schools). In others, local authorities (such as municipalities), non-governmental organisations or other private bodies have considerable freedom to establish the processes and procedures for evaluating their own ECEC provision. In these cases, aggregated information on external evaluations is limited<sup>175</sup>.

**Figure 14. Where centre-based ECEC evaluation exists, process quality is more often considered a factor when it comes to older children**



Source: Eurydice 2025, Monitor Toolbox

Note: The figure reflects the content of top-level educational guidelines and other top-level regulations and recommendations. External evaluation of settings is a quality-control process carried out by individuals or teams who report to a local, regional or top-level education authority and who are not directly involved in the activities of the setting being evaluated. The objective is to evaluate or monitor the performance of the setting, report on the quality of the provision and suggest ways to improve practice. Structural quality refers to the framework conditions supporting the day-to-day practice within settings and is evaluated through checking compliance with ECEC system regulations and standards at the setting level. Process quality refers to how well the setting supports children's holistic development, wellbeing and learning. For more information, see the downloadable Excel file.

Although quality can also be evaluated at the level of each individual setting, an overall picture can help identify strengths and weaknesses at the system level and, in turn, can affect practices at the level of individual settings. Such an overall picture can guide national policy developments like the continuing professional development of staff.

Figure 15 illustrates the extent to which countries conducted national evaluations of ECEC quality between 2018 and 2023 based on site visits. Fourteen education systems did not carry out any national evaluation during this period. In six systems, broad national analyses were conducted using data from sources other than external evaluations of individual settings. Just over a third of all EU education systems aggregated findings from individual setting evaluations

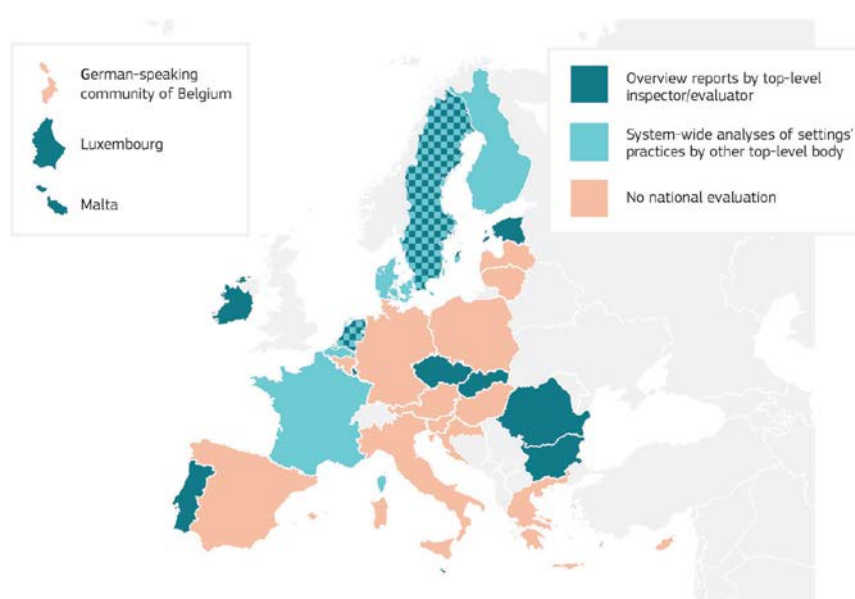
<sup>174</sup> There is only limited evidence of the effects of indicators of structural quality such as group size on children's development and learning. A possible reason for this is that structural characteristics are indirectly related to child development and learning *through* process quality. In other words, these factors can create the conditions for delivering high process quality. For an overview, see a [2018 OECD report](#) on engaging young children and a [2022 OECD policy brief](#) on quality assurance and improvement in the ECEC sector.

<sup>175</sup> There is also considerable variation between countries in terms of the frequency of external evaluations. In some countries, they happen cyclically. In others, it is up to the body responsible to decide, or it happens only under specific circumstances, for instance when complaints are received. For further detail, see the [2025 Eurydice report](#) on key data on ECEC in Europe.

into national-level reports. In several countries, while external evaluation of individual ECEC settings is carried out, there are no mechanisms to aggregate the results into a comprehensive national picture of quality. This might be hindered by the high autonomy of local evaluators, especially in those countries where ECEC services are organised based

on age groups, with separate provisions for younger and older children, and by fragmented responsibilities across ministries and authorities. Such fragmentation leads to inconsistent evaluations and weak data structures, limiting the potential for improvements in ECEC<sup>176</sup> coordinated at national level.

**Figure 15. Half of EU education systems did not carry out evaluation of the quality of ECEC at national level between 2018 and 2023**



Source: Eurydice 2025 Monitor Toolbox

Note: The evaluation reports and system-wide analyses considered address the quality of the education and care provided within ECEC settings and rely on primary sources, such as visits to settings and field observation. Overview reports prepared by top-level inspectorate/evaluator refers to reports aggregating the findings from external evaluation of individual ECEC settings. System-wide analyses target the national level rather than specific settings. Reports that focus on the activities of the evaluation body fall outside the scope. Only aggregated reports and other system-wide analyses published in 2018–2023 are included. For more information, see the downloadable Excel file.

## Main takeaway

Early childhood education and care (ECEC) participation in the EU for children aged three to the start of compulsory schooling reached 94.6% in 2023, close to the 2030 target of 96%. Eight EU countries have already met the target value, with most others exceeding 90%. This growth is attributed to policy reforms encouraging attendance and access, particularly for three-year-olds. However, participation for children under three in 2024 was 39.3% on average, with significant variations across countries. Disparities persist, notably for children at risk of poverty, especially in the 0–2 age group. In most EU countries, limited availability in the offer of ECEC places—particularly in disadvantaged areas—remains the principal obstacle to participation. On the demand side, high costs, low confidence in service quality, perceptions of insufficient standards, and limited awareness of the benefits further constrain uptake. The quality of ECEC determines its positive impact, and effective evaluation and monitoring are key to maintaining and improving that quality. While evaluations often emphasize structural quality, like compliance with health and staffing requirements, process quality such as the richness of development activities is overlooked in some countries, despite its high impact on child development. Challenges such as fragmented responsibilities and insufficient national-level data impede coherent evaluation and systemic improvement efforts.

176 Most EU countries face several challenges in coordinating monitoring and evaluation across all levels of responsibilities. One key challenge concerns aligning processes in complex governance arrangements according to which ECEC provision is regulated, funded and managed in each country. For more information, see the [2023 ECEC working group report](#) on improving the governance and monitoring and evaluation of quality in ECEC. The ECEC working group has been working to encourage EU countries to invest in evaluation and monitoring systems. For more information, see [here](#).





## CHAPTER 4. SCHOOL EDUCATION

Education systems have a great influence over young people's trajectory when they leave school. For an individual's personal and professional development, finishing compulsory education alone is however often not enough in today's world of work where more and more jobs require a complex set of skills. Therefore, ensuring that young people enter the labour market having finished at least upper secondary education, either through a general or vocational programme, is a precondition for strengthening Europe's human capital. Students who leave the education and training system without having achieved this minimum qualification are at a higher risk of unemployment and inactivity<sup>177</sup> and less likely to participate in upskilling or reskilling<sup>178</sup>. Moreover, not finishing upper secondary education is associated with lower lifetime earnings even when employed, more inequalities, linked to gender or other grounds of discrimination, less democratic participation, more social isolation, poorer health and shorter life expectancy<sup>179</sup>. Moreover, without strong support for equity in education, these disadvantages are likely to be passed on to the next generation. This chapter

looks at the latest evidence for creating pathways to success in school and increasing equity in school education.

### 4.1. Pathways to school success

#### 4.1.1. Finishing upper secondary education

EU countries agree that it should, in principle, be feasible to attain an upper secondary education by age 24<sup>180</sup>. Compulsory education ends at age 15 or 16 in most EU countries<sup>181</sup>, and the official age for concluding upper secondary education is commonly 18. Enrolment in upper secondary education goes down rapidly after that age, though this drop occurs slightly later in vocational programmes (Figure 16). Across the EU, 54.3% of all 18-year-olds are still enrolled in upper secondary education, compared with 10.0% at age 20 and 2.5% at age 24<sup>182</sup>. In terms of successful completion, by age 19, the share of people who have attained an upper secondary education or higher is 62.3% and goes up to 86.6% among 24-year-olds.

177 Youth unemployment (15-29-year-olds) was 11.3% on average across the EU in 2024 and 18.9% among those who had not completed upper secondary education. In 2024, the average share of 15-29-year-olds in the EU not in employment, education or training (NEET) was 11.0%, and 12.6% among those who had not completed upper secondary education. [Monitor Toolbox](#)

178 By way of illustration, the 2024 EU average share of adults aged 25 to 64 who participated in education or training during the last 12 months is 28.1% among those who had completed upper secondary education, but only 12.4% among those who had not. The share of adults participating in adult learning in the last four weeks is 13.3%, but only 5.5% among those without an upper secondary education. [Monitor Toolbox](#) See [Chapter 7](#) for more on adult learning.

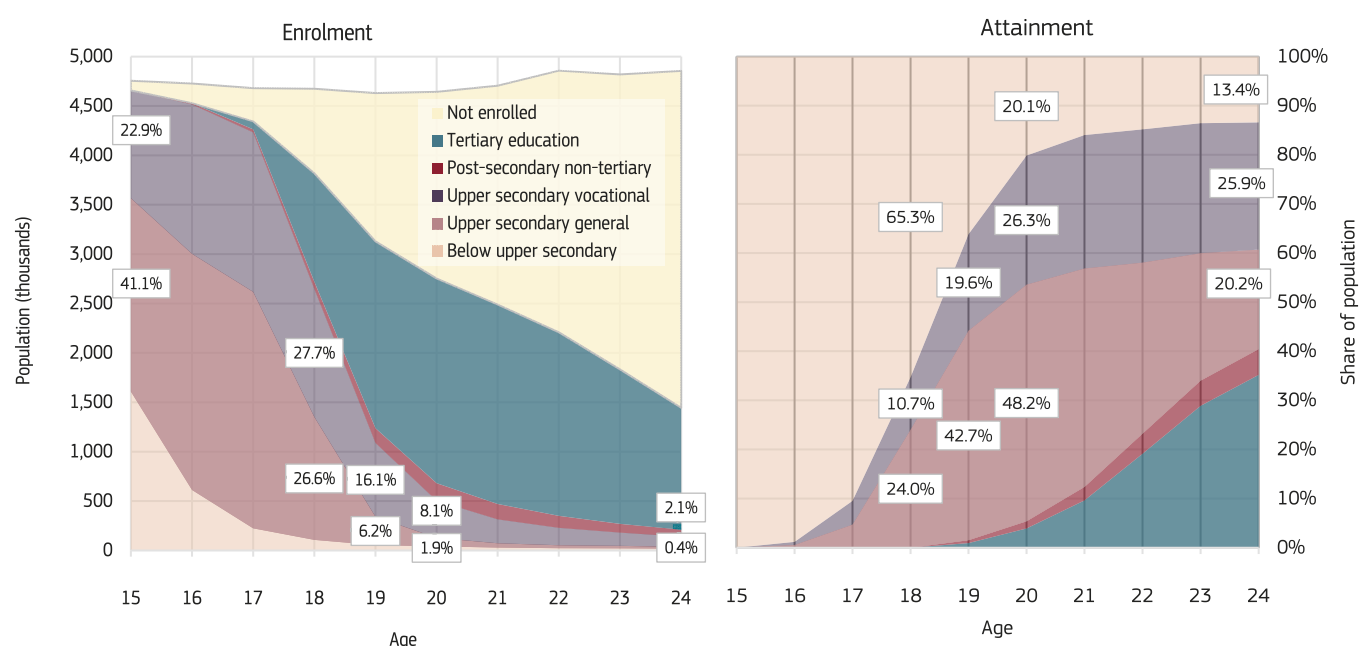
179 For more on the implications of not achieving an upper secondary education, see the [2025 ENESET ad hoc report](#) on pathways of absenteeism and early leaving from education and training, as well as the [2022 European Commission staff working document](#) accompanying the Commission's proposal for a Council Recommendation on pathways to school success.

180 The [2021 Council Resolution](#) on the EEA indicates that the 2030 EU-level target on early school leaving is accompanied by a supporting indicator on upper secondary educational attainment, covering the age bracket 20-24.

181 In six EU countries, the compulsory schooling age was 18 in school year 2023/2024 (Belgium, Germany, France, Portugal, Romania, and Finland), and 2 EU countries required additional compulsory part-time education until age 18 (Austria and Poland). See a [2023 Eurydice report on compulsory education in Europe](#).

182 On average, 26.8% of 24-year-olds have moved on to higher levels of education and 70.2% of them are no longer enrolled at all.

Figure 16. **By age 24, enrolment in secondary education is negligible and attainment is at 86.6%**



Source: Eurostat (UOE joint data collection 2023, EU Labour Force Survey 2023). [Download data](#) [Monitor Toolbox](#)

Note: Labels in the left-hand chart correspond to the share of students of a certain age enrolled in upper secondary general/vocational programmes. Labels in the right-hand chart correspond to the share of the population by educational attainment.

Across the EU, 85.1% of the 20-24 age group have achieved at least an upper secondary education, which is 2.9 percentage points higher than 10 years ago<sup>183</sup>. Rates top 95% in Croatia (97.7%), Ireland (96.5%) and Greece (96.2%), and remain close to 75% in Denmark (76.2%) and Germany (76.0%). However, rates are lower, in rural areas in Estonia (73.0%), Romania (71.3%) and Denmark (63.9%), and in suburban areas in Luxembourg (73.6%), Germany (73.6%) and Denmark (69.5%). Low rates of upper secondary attainment can stem from high dropout rates and low levels of enrolment, often reinforced by early tracking. Progress over the last decade has been most pronounced in Portugal (12.1 percentage points), Luxembourg (12.0) and Spain (11.4). Overall, underperforming countries have been catching up, resulting in a positive convergence over time<sup>184</sup>.

In many EU education systems, completion rates in upper secondary education are still relatively low within the theoretical duration of the programme. However, with two extra years, completion rates are above 80% in all EU education systems with available data, apart from Latvia (76.6%), Luxembourg (78.1%), Portugal (79.7%) and Italy (79.9%)<sup>185</sup>. Such completion rates two years beyond the theoretical duration are consistently lower among men than among women. They are also much lower in vocational programmes than in general programmes.

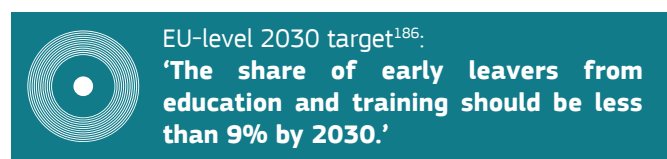
<sup>183</sup> On average, women (86.8%) are 5.0 percentage points more likely to have attained at least upper secondary education than men (81.8%). But the gender gap varies considerably between EU countries, from a female advantage of 10.2 percentage points in Malta and 9.6 in Denmark, to a male advantage of 2.6 percentage points in Romania and 0.2 in Bulgaria. [Monitor Toolbox](#)

<sup>184</sup> Using Eurofound's online [convergeEU app](#), beta convergence between EU countries over the 2015-2024 period proves statistically significant. This means that the worst-performing countries are catching up.

<sup>185</sup> Data are from the [OECD's Education at a Glance 2023](#) and the comparison here covers only 14 EU education systems. [Monitor Toolbox](#)

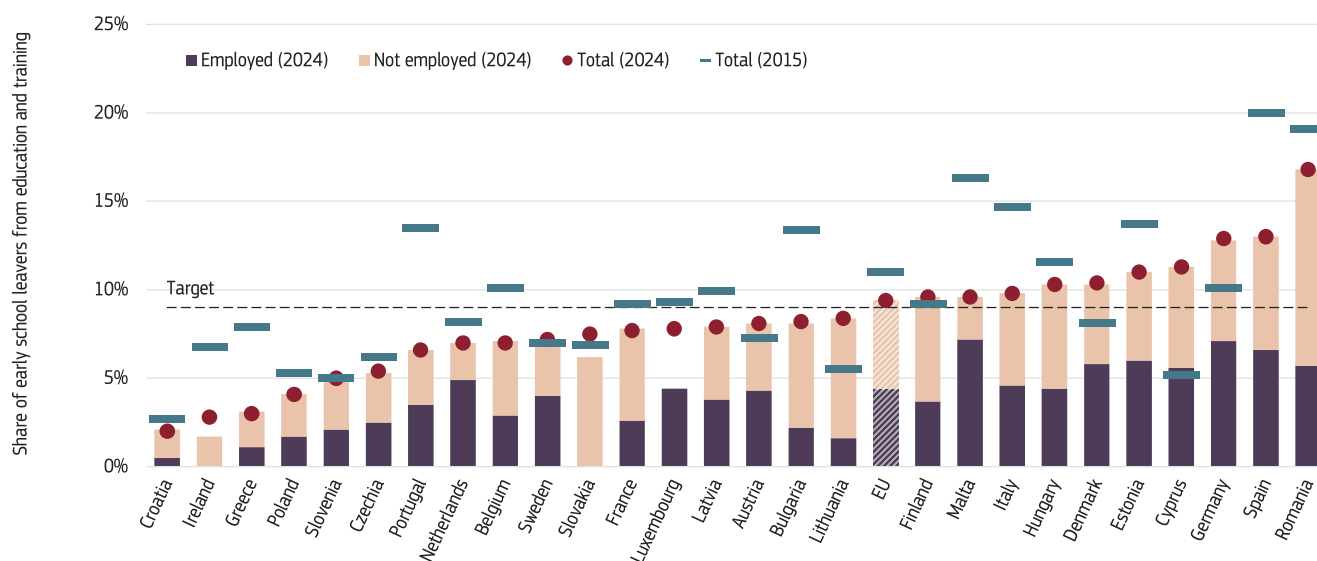


### 4.1.2. Confronting early school leaving



The decline in early school leaving<sup>187</sup> in the EU in the past decades is a remarkable success story of EU education systems. Since monitoring began in 2002, the early school leaving rate fell from 16.9% to 9.4% in 2024<sup>188</sup>. This translates into approximately 3.1 million 18-24-year-olds in the EU remaining disengaged from education and training without having attained at least an upper secondary education in 2024.

Figure 17. Early school leaving is down to 9.4%, nearing the target of less than 9%



Source: Eurostat (EU-Labour Force Survey). [Download data](#) [Monitor Toolbox](#)

Note: Breaks in time series and reliability flags available at the downloadable Excel file. Countries shown in ascending order by total early school leavers in 2024.

17 EU countries have achieved an early school leaving rate of below 9%<sup>189</sup>. Progress over the last decade (Figure 17) has been most substantial in Spain (-7.0 percentage points), Portugal (-6.9), Malta (-6.7) and Bulgaria (-5.2). However, seven countries still have early school leaving rates above 10%, and recent trends are more mixed<sup>190</sup>. Between 2015 and 2024, early school leaving increased in 8 EU countries<sup>191</sup>, with the largest rises observed in Cyprus (+6.1 percentage points), Lithuania (+2.9), Germany (+2.8), and Denmark

(+2.3). Focusing on the most recent period, the year-on-year change from 2023 and 2024 was significant in Lithuania (+2.0 percentage points), Estonia (+1.3) and Slovakia (+1.1). Moreover, less than half of today's early school leavers are employed (47.8%)<sup>192</sup> and research suggests that job insecurity is comparatively high even among those with a job<sup>193</sup>. A return to learning is uncommon<sup>194</sup>, and reaching out to these young people is difficult once they have left

<sup>186</sup> Originating in [2021 EEA strategic framework Resolution](#).

<sup>187</sup> The indicator on early leaving from education and training (ELET) measures the share of the population aged 18-24 with at most a lower secondary education and not in formal or non-formal education and training in the four weeks prior to the survey. While the term 'early school leaving' is used here, this indicator also covers early exits from all forms of education and training, including non-school-based pathways such as VET.

<sup>188</sup> The early school leaving rate is only 7.3% among 18-year-olds, increasing to 10.7% among 24-year-olds. Non-formal learning is low and uneven among 18-24-year-olds with at most a lower secondary education, averaging 9.8% across the EU. [Monitor Toolbox](#)

<sup>189</sup> Belgium, Bulgaria, Czechia, Ireland, Greece, France, Croatia, Latvia, the Netherlands, Luxembourg, Lithuania, Austria, Poland, Portugal, Slovenia, Slovakia, Sweden.

<sup>190</sup> Against this backdrop, in 2025, the European Commission suggested further decreasing the share of early leavers from education and training, from at least 9% to at least 7%. See the [Interim evaluation of the 2021-2030 European Area Strategic framework](#).

<sup>191</sup> Germany, Denmark, Lithuania, Cyprus, Austria, Slovakia, Sweden, and Finland.

<sup>192</sup> The employment status of early school leavers is incredibly diverse across the EU, ranging from 75.0% in employment in Malta and 70.0% in the Netherlands to employment rates below 20% in Slovakia (17.3%) and Lithuania (19.0%). [Monitor Toolbox](#)

<sup>193</sup> For more on job insecurity, see a [2023 Eurofound report](#) on psychosocial risks to workers' wellbeing.

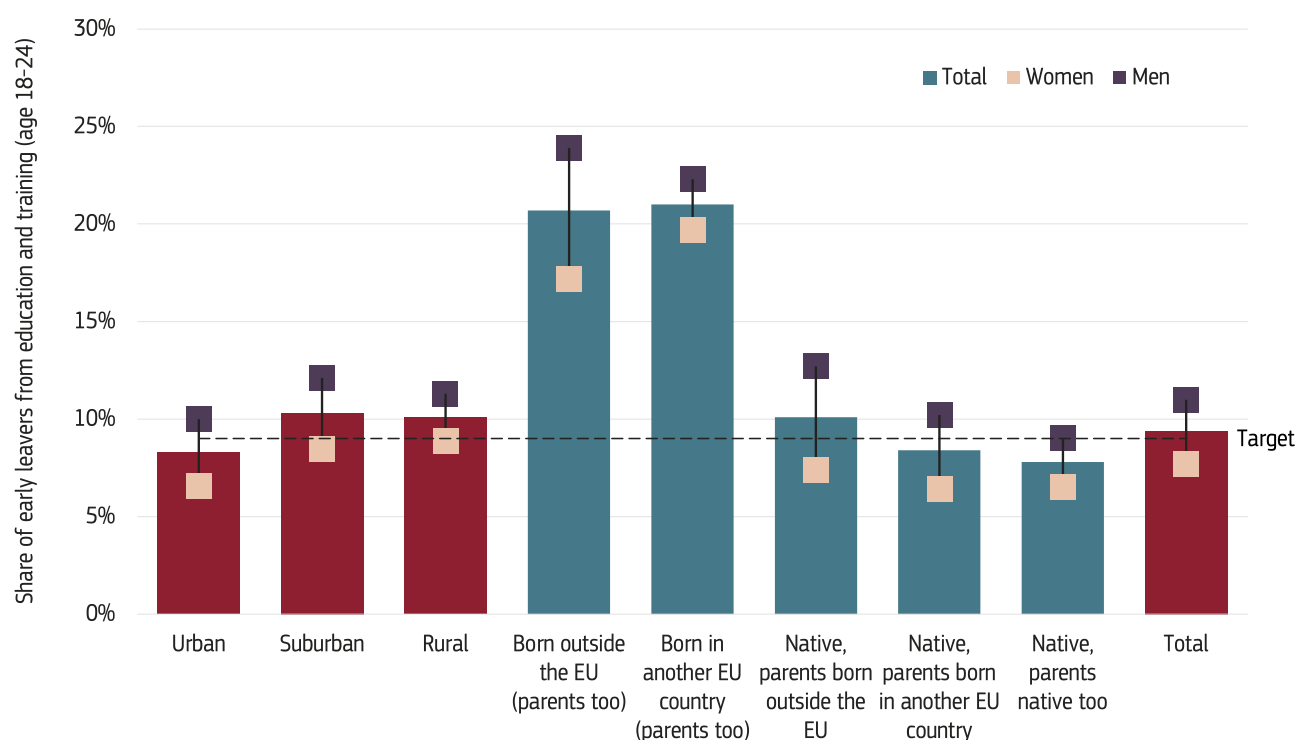
<sup>194</sup> See [Chapter 7](#) for more on adult learning by the level of educational attainment. Moreover, older birth cohorts also have high early school leaving rates, hinting at a lack of (successful) second-chance education. The early school leaving rate averages 11.9% among 25-29-year-olds and 12.6% among 25-34-year-olds. [Monitor Toolbox](#)

the education and training system<sup>195</sup>. A concerted focus on prevention and intervention is therefore key.

Beyond differences between countries, early school leaving also varies significantly depending on the degree of urbanisation, migration background, and gender (Figure 18). On average, men (11.0%) are more likely to become early school leavers than women (7.7%)<sup>196</sup>, although female early school leaving rates skyrocket to 42.4% when there are children in the household<sup>197</sup>. Cities (8.3%) have lower early school leaving rates than suburban (10.3) and rural areas (10.1%)<sup>198</sup>. However, the urban-rural divide is largely driven

by remarkable differences in the rates in several countries, notably Romania (24.2 percentage points), Bulgaria (14.6), and Hungary (11.7). A migration background is associated with higher risks of early school leaving, with rates among migrants more than twice as high as those of native-born young people<sup>199</sup>. Newly arrived migrants face the greatest challenge<sup>200</sup> compared with those who arrived in the host country well before secondary education<sup>201</sup> or native-born young people with parents born abroad<sup>202</sup>. The scale of this challenge is comparable to that faced by young people with disabilities, who continue to experience disproportionate risks of early school leaving.<sup>203</sup>

Figure 18. **Early school leaving rates exceed 20% for young people born abroad**



Source: Eurostat (EU-Labour Force Survey 2024). [Download data](#) [Monitor Toolbox](#)

Note: Low reliability data for natives with foreign-born (EU) parents and foreign born (non-EU) with native parents in the own and parental country of birth breakdown.

195 As part of the [reinforced Youth Guarantee](#), public employment services reach out to young people under the age of 30 who are not in employment, education or training (NEET) and offer them employment, an apprenticeship, a traineeship or continued education. Monitoring suggests that a negligible number of NEETs pick up on an education offer. On early leaving from VET, see the [Cedefop VET toolkit for tackling early leaving](#), which includes guidelines on effective monitoring systems to identify and support early leavers.

196 In fact, women already reached the 2030 EU-level target in 2017.

197 See a [2025 Eurofound report](#) on working for children based on 2023 figures. The same report also provides a closer look at the share of early school leavers over time by parental educational attainment and jobless households.

198 Germany has the highest urban early school leaving rate across the EU (11.7%) and Cyprus the highest suburban early school leaving rate (18.8%). [Monitor Toolbox](#)

199 On average, the difference in early school leaving rates between individuals born in another EU country and those born outside the EU is small.

200 On average, 18-24-year-olds who were born outside the EU and arrived in the host country eight years ago have the highest early school leaving rates (28.6%). [Monitor Toolbox](#)  
It is worth noting that while some of these newly arrived migrant children were in the official age range for secondary education when they came to the host country, others may already have dropped out of education and training in their country of origin.

201 On average, early school leaving rates are as low as 10.2% for 18-24-year-olds who were born in another country (EU or non-EU) and who arrived in the host country 17 years ago. [Monitor Toolbox](#)

202 On average, the early school leaving rate of 18-24-year-olds who were born in the reporting country but whose parents were born outside the EU is 10.1%. [Monitor Toolbox](#)

203 In 2024, the early school leaving rate was 24.6% for 18-24-year-olds who experienced some or severe limitations in their daily life, compared to 8.0% for their peers who experienced no activity limitations.

No single cause explains early school leaving – it is a complex, long-term process influenced by many factors. Disengagement can begin early and often goes unnoticed. A recent literature review identifies multiple, interacting drivers at the level of the individual, their family, the school and the system<sup>204</sup>. These include socio-economic background and educational stratification (see [Section 4.2](#)), but also learning difficulties, health issues, migration background, unstable home environments, poor parental engagement, weak student-teacher relationships, lack of belonging and a poor school climate.

### 4.1.3. Preventing disengagement from school

Effective strategies to tackle early school leaving are cross-sectoral and multi-targeted, while also seeking the perspective of young people themselves. Moreover, all prevention and intervention efforts depend on a more contextual, intersectional focus on equity and reducing segregation in school education ([Section 4.2](#)). According to the literature<sup>205</sup>, measures at school level<sup>206</sup> are most promising for prevention and intervention efforts. Key measures at school level focus on teacher support, positive student-teacher relationships and an inclusive schooling (see Box 10).

#### Box 10. Effective school-level measures to prevent early school leaving<sup>207</sup>

A first category of school-level strategies focuses on strengthening students' academic skills. Alternative learning pathways, such as vocational and training courses within general schools, offer tailored routes for students at risk of disengagement. Several EU countries have recently introduced flexible vocational programmes for students at risk of dropping out (Denmark, Luxembourg, Malta, and the Netherlands)<sup>208</sup>. A successful example from Italy combined small class sizes, mentorship from individuals with migrant backgrounds, and a focus on citizenship education, resulting in no dropouts among participants. Other academic support measures include learning camps after school or during holidays to improve basic skills. In Sweden, schools are required to offer such holiday schools to students who may not qualify for upper secondary education and to those with weaker language skills<sup>209</sup>.

A second category focuses on providing socio-emotional support to learners. This can include teaching students to manage their emotions and behaviour, especially in stressful situations. The Portugal-based initiative 'Dream teens' promotes youth participation, skill building and adult mentorship. Whole-school approaches aim to improve the overall psychosocial environment in school and create a positive school climate by fostering relationships, belonging and motivation. Cognitive behavioural interventions like *FRIENDS*, implemented in several EU countries, including Ireland, Slovenia and Sweden, have proven effective in reducing anxiety and depression while improving emotional regulation and self-esteem.

Mentoring can combine both academic and non-academic support. It pairs students with trusted adults who act as key links between school, home and the wider community. For example, in Luxembourg, the National Youth Service reaches out to offer guidance to young people at risk of dropping out of school<sup>210</sup>. School-based mentoring programmes have demonstrated potential to improve behaviour, attitudes, and academic performance.

<sup>204</sup> See the [2025 ENESET ad hoc report](#) on pathways of absenteeism and early leaving from education and training; and, a [2023 Cedefop report](#) on early leaving from VET.

<sup>205</sup> See the [2025 ENESET ad hoc report](#) on pathways of absenteeism and early leaving from education and training.

<sup>206</sup> In VET, this can include the workplace in work-based learning environments. See the [Cedefop toolkit on early leaving from VET](#).

<sup>207</sup> See the [2025 ENESET ad hoc report](#) on pathways of absenteeism and early leaving from education and training.

<sup>208</sup> For more details about national developments, see the 2025 Education and Training Monitor's country reports for [Denmark](#), [Luxembourg](#), [Malta](#), and [the Netherlands](#). See also [Section 5.2](#) on flexible pathways in VET.

<sup>209</sup> For more details about national developments, see the 2025 Education and Training Monitor's country report for [Sweden](#).

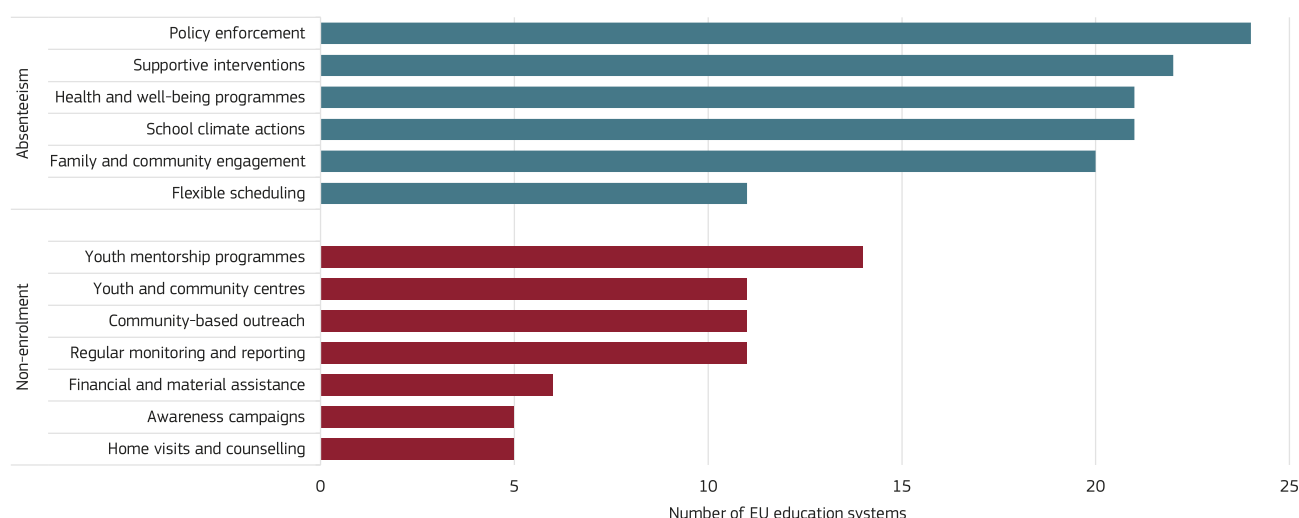
<sup>210</sup> For more details about national developments, see the 2025 Education and Training Monitor's country report for [Luxembourg](#).

At system level, effective measures include improving the attractiveness and flexibility of vocational pathways (see [Chapter 5](#)), prolonging mandatory schooling age<sup>211</sup>, enriching competency frameworks for teacher education and training<sup>212</sup>, guidance and counselling<sup>213</sup>, and early warning systems. Early warning systems can help schools detect and respond to early signs of disengagement<sup>214</sup>. Screening tools are required to detect not only behavioural but also emotional and cognitive signals, reaching all the way back to ECEC (see [Chapter 3](#)). No more than eight EU countries currently have policies in place promoting the implementation of such a system: Bulgaria, France, Italy, Lithuania, Hungary, Malta, Poland and Romania. However, new developments across EU education systems are promising<sup>215</sup>.

Finally, the cross-sectoral and multi-targeted nature of effective prevention and intervention measures is illustrated

by EU countries' current responses to problems of absenteeism and young people who have left school. Apart from Ireland, all EU countries have policies in place to address absenteeism, which is one of the early signs of disengagement and a possible precursor to early school leaving<sup>216</sup>. Most education systems enforce clear attendance policies (Figure 19), often accompanied by counselling and mentoring for students with high absenteeism rates (supportive interventions). Moreover, 21 systems report having health and wellbeing programmes. Measures to improve the school environment are equally common, focused on fostering a positive, inclusive school environment. Family and community engagement is reported for 20 EU education systems and includes collaborating with families and engaging with the community not only to discuss attendance patterns, but also to address underlying issues such as transportation challenges, family responsibilities or lack of support.

Figure 19. **EU countries use multi-targeted responses to tackle absenteeism and non-enrolment**



Source: [2025 Eurydice system-level indicators](#) on early school leaving. [Download data](#) [Monitor Toolbox](#)

Note: There are 29 EU education systems monitored in total, with the French, German-speaking and Flemish communities of Belgium counted separately.

- 211 The compulsory schooling age has recently been raised to 18 in Estonia and Luxembourg. For more details see the 2025 Education and Training Monitor's country report for [Estonia](#) and [Luxembourg](#). Raising the compulsory schooling age can effectively reduce early leaving, but reforms need to be carefully designed to be effective, in particular in systems with grade retention. See a 2011 [research paper](#) on a reform in the Netherlands and a 2023 [research paper](#) on a reform in Hungary.
- 212 Competency frameworks for initial teacher education and programmes for continuing professional development commonly include a wide variety of different teacher competencies that help to prevent and tackle early school leaving. While diagnosing risk factors for early school leaving (such as learning difficulties, truancy, illness, peer influence or teacher-student relationships) and developing effective measures to prevent early school leaving are covered in initial teacher education in only 15 and 11 EU education systems respectively, they are covered in continuing professional development in 21 and 19 systems respectively. Moreover, other relevant competences are more commonly covered, such as teaching diverse learners and promoting inclusive approaches, promoting a positive school climate, teaching in multilingual and multicultural settings, awareness of learners' social and emotional development and collaborating effectively with families from different background. See the [2025 Eurydice system-level indicators](#) on early school leaving.
- 213 For more information, see the [2022 Cedefop report](#) on guidance and counselling to address early leaving in VET.
- 214 For more information, see [Cedefop guidelines for effective early warning systems](#) to prevent early leaving from VET.
- 215 Latvia is developing an education quality monitoring system that includes early warning data. The Netherlands is implementing a new law on school absenteeism that will ensure better monitoring of attendance and faster targeted actions to prevent early school leaving. Portugal is developing a data platform to help schools identify and support students at risk of dropping out. Slovakia has launched a national project to develop and test an early warning system that identifies and supports at-risk students. See [2025 Eurydice system-level indicators](#) on early school leaving.
- 216 Among the EU countries with available data, PISA 2022 shows that the share of students who reported that they had missed school for more than three consecutive months ranges from below-5% in Finland (3.4%) and Portugal (3.7%) to above-10% in Malta (13.4%), Bulgaria (11.7%), Slovakia (11.2%) and France (10.2%). Illness is mentioned by far most frequently as a reason for long-term absenteeism. Boredom, school closures, feelings of unsafety and caring responsibilities are all reported too, though much less often. Missing EU countries (apart from Luxembourg) are Austria, Germany, Italy and Spain. The indicator refers to long-term absenteeism at any education level at least once. Caution is warranted, since non-response rates can be high and are unlikely to be random. [Monitor Toolbox](#)

Reaching out to young people who are not enrolled in the education system in the first place is even more challenging<sup>217</sup>. No less than six EU education systems<sup>218</sup> report no measures at all to monitor or reach out to non-enrolled young people, although Hungary and Slovakia have the only education systems among the six with non-negligible out-of-school rates<sup>219</sup>. The most frequently mentioned policy is youth mentorship programmes, although less than half of all systems (14) report having these programmes. Such programmes connect young people who have dropped out of school with mentors for guidance on education and career opportunities. Community outreach (11 systems) and community centres (11 systems) partner with local community organisations, NGOs or social workers to reach out, particularly in remote areas, to young people who are not in school.

## Main takeaway

The share of early school leavers among 18-24-year-olds is down to 9.4%, close to the target of below 9%. Although most EU countries have achieved this target, a few experienced an increase in early school leaving between 2015 and 2024. On average, boys (10.9%) are more likely to become early school leavers than girls (7.7%). Significant rural disadvantages persist in several EU countries and students with disabilities are disproportionately affected. Newly arrived migrants are at particular risk of early school leaving, with rates of up to 28.6%. Early school leaving is a complex issue driven by interconnected factors, including socio-economic background, home and school environments, learning difficulties, limited access to relevant support, and weak student-teacher relationships. Effective strategies to combat absenteeism and disengagement require cross-sectoral, multi-targeted approaches that foster inclusive and accessible school environments, support the development of cognitive and socio-emotional skills, enhance vocational pathways, and implement early warning systems to address these diverse challenges.

## 4.2. Equity in school education

### 4.2.1. Helping disadvantaged students succeed



Suggested 2030 EU-level target<sup>220</sup>:  
**‘By 2030, the share of learners from disadvantaged socio-economic backgrounds with a good achievement in at least one domain (reading, mathematics or science) should be at least 25%.’**

Socio-economic background is the single largest determinant of educational disadvantage<sup>221</sup>. Factors like parents’ education, job and income still have an outsized influence on children’s success in school, dictating, among other things, access to the best schools<sup>222</sup>, private tutoring<sup>223</sup>, school trips

217 Out-of-school rates were discussed in detail in the 2024 edition of the Education and Training Monitor’s [comparative report](#). The online [Monitor Toolbox](#) includes out-of-school rates for the official age range of lower secondary and upper secondary education, out-of-school rates at age 14, 15 and 16, and out-of-school rates when standardising the mandatory schooling age. The issue of non-enrolled youth is particularly pronounced in Romania, followed by Bulgaria and Hungary. [Monitor Toolbox](#)

218 The German-speaking community of Belgium, Ireland, Greece, Hungary, Portugal and Slovakia. See the [2025 Eurydice system-level indicators](#) on early school leaving.

219 Portugal is another interesting case, where out-of-school rates skyrocket the year mandatory schooling age ends. [Monitor Toolbox](#)

220 See the [Interim evaluation of the 2021-2030 European Area Strategic framework](#).

221 See the [2021 Council conclusions](#) on equity and inclusion in education and training in order to promote educational success for all.

222 See the [2023 OECD report](#) on equity and inclusion in education.

223 See the [2020 Eurydice report](#) on equity in school education.



and events<sup>224</sup>, a proper breakfast before each school day<sup>225</sup>, a nurturing learning environment at home<sup>226</sup> and academic expectations<sup>227</sup>. Conversely, a disadvantaged socio-economic background makes it very difficult for young talent to develop fully, which negatively impacts intergenerational mobility and economic growth. Particularly in times of substantial demographic ageing, it is up to education systems to maximise the human capital of tomorrow's working-age population<sup>228</sup>. Research shows that the education systems that aim to reduce inequality in learning conditions are also the ones that get better overall academic results and improve students' wellbeing<sup>229</sup>.

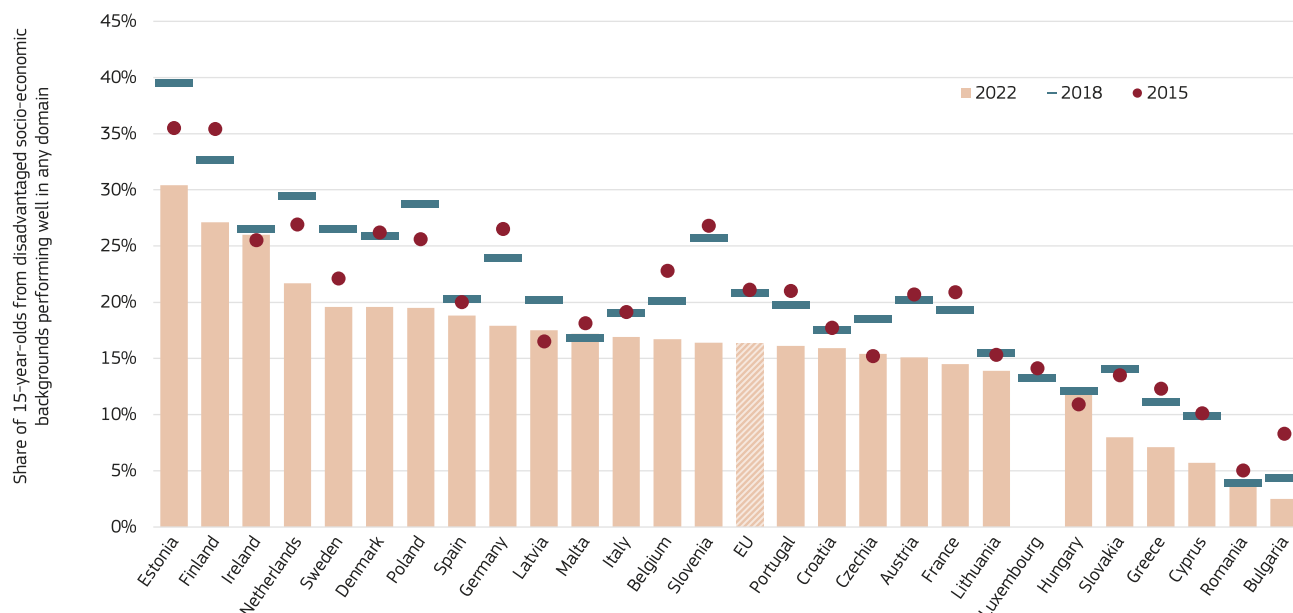
Across the EU no less than 28.8% of students from disadvantaged socio-economic backgrounds experience severe underachievement in school, a rate six times higher than the 4.7% observed among students from advantaged backgrounds<sup>230</sup>. These students underachieve not just in a single domain like reading, mathematics or science, but in all three domains at the same time. This section discusses how to move the needle on equity in education by learning from

the performance and characteristics of the most equitable school education systems.

The share of students from disadvantaged socio-economic backgrounds performing well in any domain, be it reading, mathematics or science, is a useful benchmark for decoupling educational achievement from socio-economic background and reflecting the pathways for upward educational mobility. Here, good achievement is defined as reaching at least level 4 on the OECD's PISA scale, which is at least two levels higher than underachievement. This broad indicator of upward mobility captures strong performance without restricting the benchmark to top performers (level 5 and 6). Figure 20 shows that 16.3% of students reached this threshold in 2022 despite their disadvantaged socio-economic background, down from 20.8% in 2018 and 21.1% in 2015. This means that fewer disadvantaged students are reaching a good level of achievement. While performance declined for all students (see [Chapter 2](#)), more than three times as many students from an advantaged socio-economic background reached a good level of achievement in 2022<sup>231</sup>.

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- 224 In 2021, the EU average share of children at risk of poverty or social exclusion lacking access to school trips and school events that cost money was 34.9%, compared to a share of 16.1% among children not at risk of poverty or social exclusion. See the [2025 Eurofound report](#) 'Working for Children Matters: An Overview on Service Delivery and Workforce and in Europe' based on the indicators of the European Child Guarantee monitoring framework established by the European Commission and the Social Protection Committee.
- 225 In 2022, the EU average share of children ranking 'low' on a family affluence scale having breakfast (more than a glass of milk or fruit juice) every school day was 40.2%, compared to a share of 49.8% for 'medium' family affluence and 53.6% for 'high' family affluence. See the [2025 Eurofound report](#) 'Working for Children Matters: An Overview on Service Delivery and Workforce and in Europe' based on the indicators of the European Child Guarantee monitoring framework established by the European Commission and the Social Protection Committee. See also a [2025 European Commission report](#) on school meal programmes in the EU.
- 226 Indicated by, for instance, the number of books at home or having a quiet place to study.
- 227 Across the EU, 80.2% of students from advantaged socio-economic backgrounds expect to complete tertiary education, while only 50.6% of students from disadvantaged socio-economic backgrounds do the same. [Monitor Toolbox](#)
- 228 The [2024 Letta Report](#) highlights that closing educational inequalities is essential for strengthening Europe's human capital, economic resilience, and global competitiveness.
- 229 See the [2022 final report](#) of the European Commission expert group on quality investment in education and training.
- 230 Looking at the percentage-point gap between the two groups, the worst-performing countries are Romania (48.8), Bulgaria (46.1) and Slovakia (40.0). [Monitor Toolbox](#)
- 231 This compares to a share of 34.8% for all 15-year-olds regardless of socio-economic background and a share of 59.0% of those from advantaged socio-economic backgrounds.

Figure 20. **Across the EU, 16.3% of students reach at least a good level of achievement in reading, mathematics or science despite their disadvantaged socio-economic background**



Source: OECD (PISA). [Download data](#) [Monitor Toolbox](#)

Note: Data for Luxembourg and Cyprus in 2015 and 2018 are based on the original ESCS index, hence not fully comparable with the other countries. Countries are shown in descending order according to the latest available data. Luxembourg did not participate in PISA 2022.

Ten years ago, about half of all EU countries reported that at least 1 out of every 5 students from disadvantaged socio-economic backgrounds performed well in at least one domain<sup>232</sup>. According to the latest data, only four countries still manage to do the same (Estonia, Finland, Ireland and the Netherlands). The situation has worsened in most countries, with a particularly strong deterioration in Slovenia (10.4 percentage points), Germany (8.7) and Finland (8.3).

232 Estonia, Finland, the Netherlands, Slovenia, Germany, Denmark, Poland, Ireland, Belgium, Sweden, Portugal, France and Austria. [Monitor Toolbox](#)

**Box 11. Other determinants of educational disadvantage**

Socio-economic background is the single largest determinant of educational disadvantage, but it is not the only one. A migration or refugee background sometimes correlates with socio-economic background but also has specific ways of translating into educational disadvantage. Examples of this are language barriers, information asymmetry and discrimination<sup>233</sup>. Students with a migration background often remain concentrated in schools where they have little contact with their native-born peers. Such isolation is greatest in Austria (0.29), Belgium (0.24) and France (0.23)<sup>234</sup>. Across the EU (with the exception of Lithuania, the Netherlands, Romania and Slovakia), competency frameworks for initial teacher education and programmes for continuing professional development commonly include a focus on teaching in multilingual and multicultural settings<sup>235</sup>.

Special education needs, ill health and disability are other key determinants of educational disadvantage<sup>236</sup>. In its most general sense, illness is the biggest reason by far for long-term absenteeism and early school leaving rates go up dramatically with the level of disability<sup>237</sup>. Most EU education systems specifically target learners with special education needs or disabilities in policies on individual education plans<sup>238</sup>. Yet only about half of them require initial teacher education to include specific competences on disabilities<sup>239</sup>. The most immediate avenues for improvement concern broadening the understanding of inclusion towards all learners, improving professional development for educators<sup>240</sup>, introducing flexibility in funding models, and strengthening cooperation with all stakeholders, including families, communities and decision-makers<sup>241</sup>. Continuous monitoring and evaluation of policy implementation remain crucial for ensuring quality.

A 2023 Eurydice report on diversity and inclusion in schools describes efforts to address discrimination<sup>242</sup> and promote diversity from a comparative, cross-EU perspective. It shows that students with special educational needs or disabilities are the main target group in all analysed areas, including strategic policy frameworks, measures to promote access and participation, national curricula, learning and social-emotional support policies and measures, and teacher education and training. The second most widely targeted student group across most of the thematic areas are migrant and refugee students, followed by ethnic minority students such as Roma.

**4.2.2. Supporting all learners to develop their talents**

Education can play a substantial role in minimising the effect of socio-economic disadvantage on learning outcomes – and schools can serve as ‘hubs’ for cross-sectoral cooperation – but it cannot act as ‘great equaliser’ in isolation. Lasting progress can be achieved only through a holistic, cross-sectoral approach to deeply rooted inequalities. EU education systems use different approaches to reduce the link between educational achievement and socio-economic background<sup>243</sup>.

Around half of all EU education systems have policies on the socio-economic composition of schools in place that aim to tackle segregation<sup>244</sup>. School segregation based on socio-economic background risks a downward spiral of adverse learning conditions and fewer resources for disadvantaged students. Such school segregation is highest in Hungary (0.30), Bulgaria (0.29), Slovakia (0.28) and Romania (0.25)<sup>245</sup>. The lowest levels of segregation are found in Finland (0.09), Malta (0.11), and Sweden (0.13). Socio-economic segregation is influenced by contextual factors such as residential segregation, as well as by education policies including school choice and school admission criteria.

233 For more information on the barriers faced by students from migrant backgrounds, see a [2022 SPRING handbook](#) for practitioners on integrating newly arrived migrant children; a [2019 Eurydice report](#) on integrating students from migrant backgrounds; and a [2019 OECD report](#) on the road to integration.

234 **Monitor Toolbox** This measure of school segregation is based on the OECD's 2022 PISA data. It quantifies the probability that a student with a migration background is at school with students who also have migration backgrounds. The index is set between 0 (no segregation) and 1 (full segregation). Only countries where students with a migration background make up at least 5% of the student population are examined.

235 This is based on the [2023 Eurydice system-level indicators](#) on early school leaving.

236 However, for certain groups, such as students with disabilities, conducting an in-depth analysis of how educational disadvantage affects their school performance remains challenging, as they are often underrepresented in international test samples.

237 Across the EU, 18-24-year-olds reporting ‘some’ activity limitation have an early school leaving rate of 17.2%, raising to 44.2% for those reporting ‘severe’ activity limitation. **Monitor Toolbox**

238 Denmark, Estonia, Ireland, the Netherlands and Sweden are exceptions. Denmark, Estonia and Sweden nevertheless report policies on individual education plans targeting ‘all learners’. See the [2025 Eurydice system-level indicators](#) on early school leaving.

239 This concerns lower secondary education. See the [2023 Eurydice system-level indicators](#) on equity in school and higher education.

240 Teachers need to be properly prepared and supported for teaching in diverse classrooms. A [2023 OECD report](#) synthesises the skills teachers need to create equitable and inclusive learning environments for all learners, highlighting the importance of initial teacher training and continuous professional development.

241 See a 2025 [position paper](#) by the European Agency for Special Needs and Inclusive Education (EASNIE). EASNIE has also introduced two programmes to foster teachers’ and school leaders’ capacities for inclusion: [Teacher Professional Learning for Inclusion](#) and [Supporting Inclusive School Leadership](#).

242 See also the [2023 European Commission issue paper](#) on tackling different forms of discrimination in and through education and training.

243 This summary focuses on school education. Crucially, early childhood education and care (ECEC) levels the playing field in early years before compulsory schooling (see [Chapter 3](#)). ECEC not only provides a strong start for disadvantaged children, but is also an early detector (and response to) any learning difficulties. However, enrolment rates among disadvantaged children tend to be lower and the quality of provision is an important precondition for ECEC’s equalising effect. Nonetheless, research suggests that ECEC remains a particularly cost-effective avenue for improving equity in education.

244 See the [2025 Eurydice system-level indicators](#) on equity.

245 **Monitor Toolbox** This specific measure of school segregation is based on the OECD's 2022 PISA data and is sometimes referred to as the isolation index or the normalised exposure index. It quantifies the probability that a student from a disadvantaged socio-economic background is at school with students who are also from disadvantaged socio-economic backgrounds. The index is set between 0 (no segregation) and 1 (full segregation).

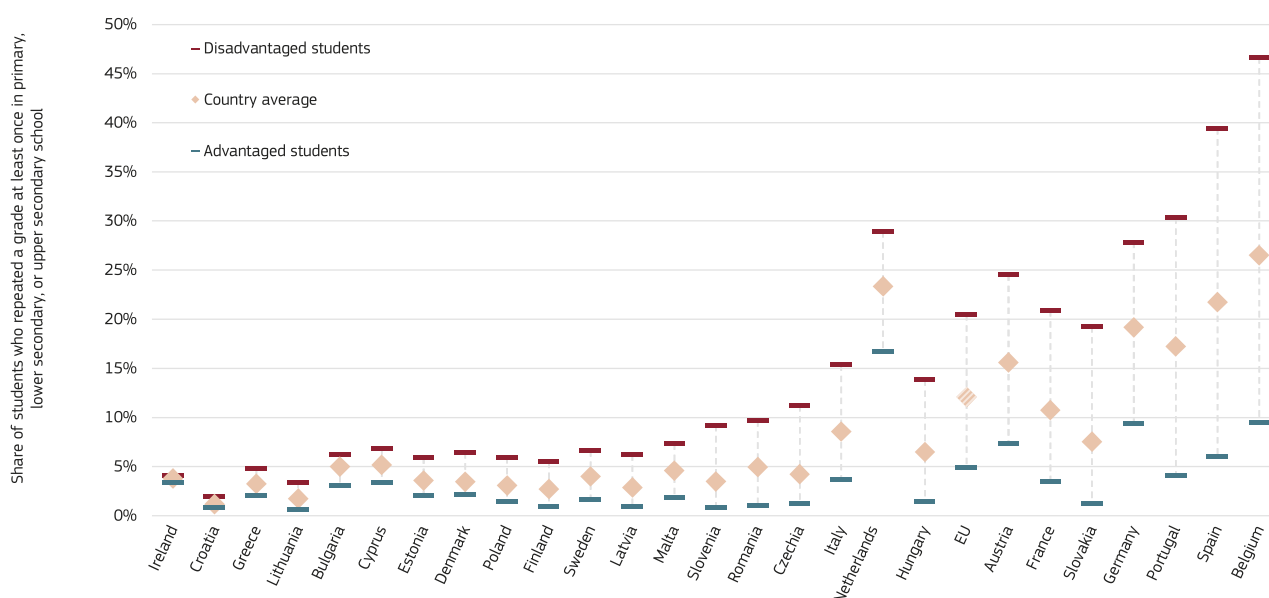
School segregation can also be the unintended result of streaming or tracking, often between general and vocational programmes<sup>246</sup>. The earlier that streaming or tracking take place, the more students' socio-economic backgrounds come into play, leading to larger gaps between advantaged and disadvantaged students<sup>247</sup> and greater underachievement in basic skills<sup>248</sup>. While early tracking<sup>249</sup> has negative effects on equity and inclusion, research suggests there is no 'optimal level of tracking', but rather a need to strike the right balance between differentiation and tracking<sup>250</sup>. Ensuring that pathways between the different tracks remain permeable, renders any level of differentiation and tracking less deterministic<sup>251</sup>.

Remedial policies are another way of decoupling educational achievement from socio-economic background and other sources of disadvantage<sup>252</sup>. The [2022 Council Recommendation](#) on pathways to school success advises that helping disadvantaged students succeed requires

active inclusion policies, a positive learning climate and individualised provisions for at-risk learners. A 2025 Eurydice report<sup>253</sup> records recent policy responses across the EU, revealing widespread changes to instruction time, curricula, assessment and learning support. Most EU education systems feature new or revised policy measures that help teachers to deliver inclusive and accessible education, whether through continuing professional development or teaching material, resources and guidance.

Research suggests that some remedial policies are effective, whereas others make matters even worse. Grade repetition is a costly example of the latter<sup>254</sup>, as it further entrenches the effect of socio-economic background (Figure 21), risks disengagement and dropping out<sup>255</sup>, and potentially diminishes the impact of more constructive remedial measures. Across the EU, 20.5% of disadvantaged students repeated a grade at least once, compared with 5.0% of advantaged students.

Figure 21. **Grade repetition entrenches the effect of socio-economic background**



Source: OECD (PISA 2022). [Download data](#) [Monitor Toolbox](#)

Note: Countries are ranked in ascending order according to the gap in grade repetition between students with disadvantaged and advantaged socio-economic backgrounds.

- 246 Such differentiation means a greater variety of school types catering to the diverse needs of students. A more homogeneous learning environment allows teachers to provide instruction better matched to students' needs. However, the segregation it causes limits the opportunity for disadvantaged students to learn from better-performing pupils.
- 247 See the [2022 final report](#) of the European Commission expert group on quality investment in education and training.
- 248 See the [2022 Council Recommendation](#) on pathways to school success.
- 249 Austria, Germany and Hungary start tracking as early as age 10, followed by Czechia and Slovakia at age 11. Other EU countries delay tracking until age 16-17 (Estonia, Finland, Sweden and Lithuania). See the [2025 Eurydice system-level indicators](#) on equity.
- 250 See the [2022 final report](#) of the European Commission expert group on quality investment in education and training.
- 251 In upper secondary education, more than half of all EU education systems allow students to change between any tracks, but only four of those systems impose no conditions on changing tracks (Denmark, Ireland, Spain, and Italy). See the [2025 Eurydice system-level indicators](#) on equity.
- 252 Some remedial policies include support to (teachers in) schools with many disadvantaged students, basically compensating for school segregation. The previous edition of the Education and Training Monitor's [comparative report](#) provided examples of financial and non-financial support. These are summarised in the [2024 Eurydice system-level indicators](#) on equity.
- 253 See the [2025 Eurydice report](#) on addressing underachievement in basic skills.
- 254 Most countries allow grade repetition in all grades, except for Germany, Spain, Luxembourg, Poland, Portugal, Romania and Slovenia, where grade repetition is allowed with certain limitations. In Bulgaria, grade progression is automatic, while Malta, the Netherlands and Sweden give schools autonomy on the issue.
- 255 See the [2022 final report](#) of the European Commission expert group on quality investment in education and training.

In contrast, identifying students at risk and providing individualised instruction are much more promising examples of remedial policies. All EU countries, apart from Ireland and the Netherlands, have policies that promote the use of individual education plans. These plans are personalised and comprehensive, and they outline the instruction, adaptations and support mechanisms to be provided in order to ensure learners' progress and development. They are a tool that can contribute to inclusive education that addresses everyone's needs. These plans most commonly target learners with special education needs or disabilities and learners from refugee or migrant backgrounds (see Box 11). Only seven countries (Spain, Italy, Lithuania, Hungary, Portugal, Romania and Slovakia) have policies on individual education plans that target learners from disadvantaged socio-economic backgrounds<sup>256</sup>. Finally, research suggests that regular one-to-one or small group tutoring provided by trained tutors during school days is particularly effective<sup>257</sup>. Some EU education systems have started introducing such tutoring during the formal school day (12 systems) and/or outside the formal school day (10 systems) to address underachievement in basic skills<sup>258</sup>.



### Main takeaway

A key objective in school education is to promote equity by helping all students succeed, including those at risk of leaving school early. However, only 16.3% of students from disadvantaged socio-economic backgrounds have a good level of achievement exceeding the minimum level in reading, mathematics or science – down from 20.7% in 2018 and 21.1% in 2015. The problem is further compounded by other determinants of educational disadvantage, such as migration, refugee status, special educational needs, poor health and disability. Some EU education systems are reforming to promote equity and inclusion, with the aim of reducing the impact of socio-economic status on educational achievement. Measures of this kind require cross-sectoral cooperation. One example is reducing sorting across schools by embracing greater diversity in schools and making sure that pathways between the different tracks remain permeable. Another example is that of remedial measures, such as active inclusion policies, promoting a positive learning climate and individualised instruction (including tutoring).

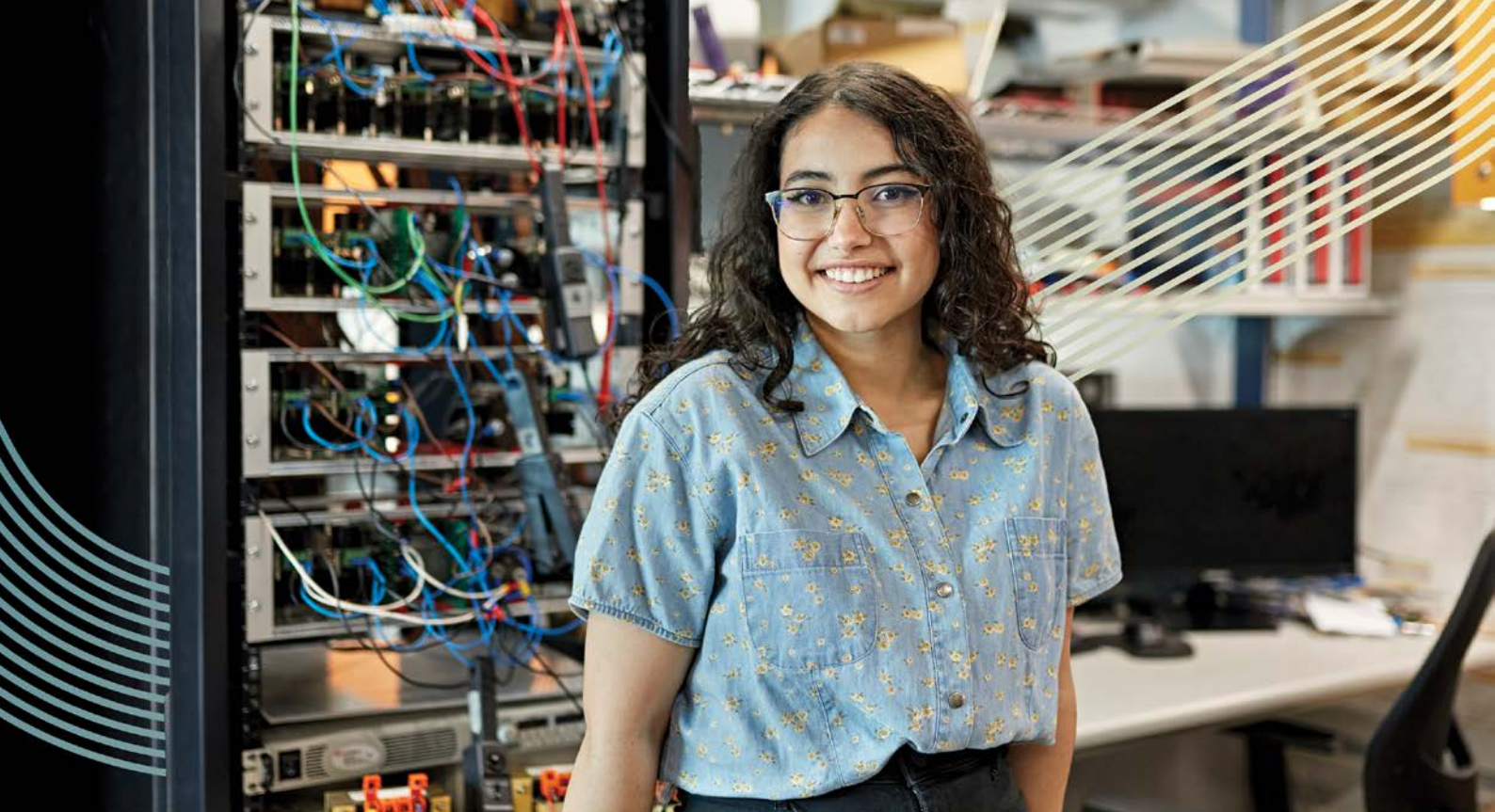
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256 See the [2025 Eurydice system-level indicators](#) on early school leaving.

257 Research suggests that the effects of these programmes are particularly pronounced if they are sustained over time and implemented in a person-specific way or through small groups. Furthermore, the effects of mentorships and summer programmes seem to depend on their design and implementation. Mentoring shows short-term benefits that often fade after the programme has concluded, while summer learning programmes are most effective when they target those students who are most in need. Digital alternatives, such as intelligent tutoring systems based on AI could reduce the costs of individualised instruction but have less impact than teacher-led tutoring. To date, intelligent systems have no advantage over traditional systems. See the [2022 final report](#) of the European Commission expert group on quality investment in education and training; a [2021 discussion paper](#) from the IZA institute of labour economics; a [2017 research paper](#); a [2023 research paper](#) from the US national bureau of economic research (NBER); and a [2025 research paper](#).

258 See the [2025 Eurydice report](#) on addressing underachievement in basic skills at school.





## CHAPTER 5. VOCATIONAL EDUCATION AND TRAINING

Vocational education and training (VET) aims to equip young people and adults with the knowledge, skills and competences required in specific occupations or on the broader labour market. VET prepares learners for work, including in many occupations in which shortages persist<sup>259</sup>, and which are key to Europe's competitiveness and preparedness<sup>260</sup>. For workers, up and reskilling through continuing VET plays a key role in updating their skills to new technologies and methods, or in entering a new profession. For learners, stronger links between VET and tertiary education could increase the attractiveness of VET programmes, by enhancing personal career prospects and personal development. This chapter looks at progress towards achieving three EU-level targets set for vocational education and training as well as permeability between VET and tertiary education.

### 5.1. Work-based learning, employment and mobility in VET



EU-level 2025 target:  
**'At least 60% of recent VET graduates should have experienced work-based learning as part of their VET programme by 2025.'**



EU-level 2025 target<sup>261</sup>:  
**'The share of employed VET graduates should be at least 82% by 2025.'**



EU-level 2030 target<sup>262</sup>:  
**'In VET, the share of vocational learners who do part of their studies abroad (learning mobility) should be at least 12% by 2030.'**

259 See Chapter 1 of the [2023 European Commission report](#) on Employment and social developments in Europe.

260 See a 2025 [European Commission \(Joint Research Centre\) report](#) on supporting the digital transformation of VET

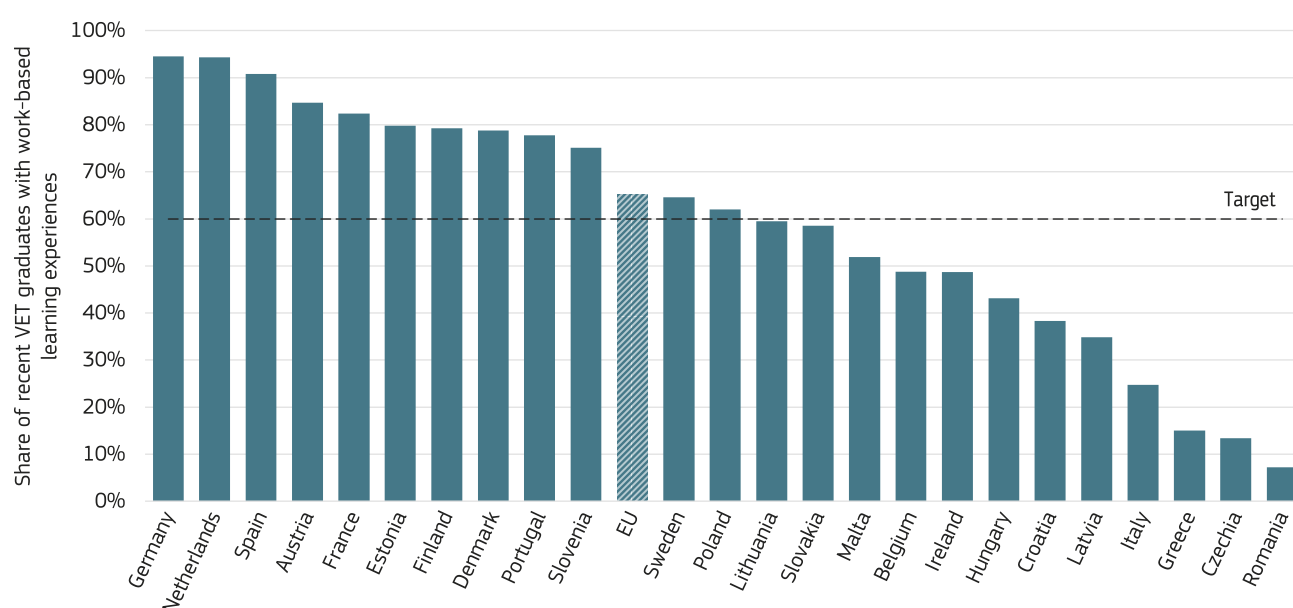
261 See the [2020 Council Recommendation](#) on vocational education and training (VET) for sustainable competitiveness, social fairness and resilience.

262 See the [2024 Council Recommendation](#) 'Europe on the Move'.

Nearly two thirds (65.2%) of recent medium-level VET graduates in the EU have experienced work-based learning<sup>263</sup> as part of their curriculum (Figure 22)<sup>264</sup>, exceeding the 2025 EU-level target of at least 60%. Work-based learning offers many advantages to learners, who receive practical experience in their chosen field, direct contact with the world of work and opportunities for future employment. For employers,

work-based learning can be an effective recruitment channel, to train and recruit staff according to their needs. However, work-based learning shows a high dispersion across EU countries. In the Netherlands, Germany and Spain, nearly all graduates take part in work-based learning, while in Romania and Czechia, very few experienced work-based learning as part of their VET curriculum.

Figure 22. **Work-based learning varies widely across countries**



Source: Eurostat (EU Labour Force Survey 2024). [Download data](#) [Monitor Toolbox](#)

Note: Reliability flags available at the downloadable Excel file.

Since data on work-based learning became available in 2021, no strong trends have emerged. The fact that the EU average was somewhat higher in 2023 and 2024 than in the previous two years<sup>265</sup> mainly reflects methodological adjustments for several EU countries, most notably for Poland. In addition, the changes in the exposure of students to work-based

learning and in the corresponding indicator are gradual<sup>266</sup> as introducing or expanding work-based learning involves changes to curricula and qualification frameworks. This often involves supporting companies, including small and medium-sized enterprises, given the key role of employers and trainers in promoting work-based learning.

<sup>263</sup> The indicator includes all VET graduates who completed the VET programme 0-3 years ago, including graduates who are still in education and training. Work-based learning in this context refers to experience gained at a workplace (besides or in addition to school-based learning or practical exercises at a training centre). The relevant work experience is part of the curriculum of the formal programme leading to the VET qualification (unlike most traineeships). Within these parameters, work-based learning varies a lot. Work experience can take place in different sectors and types of workplaces (companies, government institutions, or non-profit organisations), with varying duration (from 1 month to 1 year or longer). Learners may work under different contractual statuses (as dual learners with an employment contract, for example, or as apprentices) and conditions (paid or unpaid work experience).

<sup>264</sup> Across the EU, male VET graduates are somewhat more likely to have experienced work-based learning. The difference, at around one percentage point, is not very substantial but persistent over time. The rates were 60.6% for male graduates and 59.9% for female graduates in 2021; 60.6% versus 59.4% in 2022; 64.9% versus 64.1% in 2023; and 65.6% versus 64.6% in 2024. [Monitor Toolbox](#)

<sup>265</sup> The rate stood at 60.3% in 2021, at 60.1% in 2022 and 64.6% in 2023. [Monitor Toolbox](#)

<sup>266</sup> In addition, this indicator considers work-based learning experiences that took place several years before the survey. It concerns persons who have graduated up to three years prior to the data collection, with the work-based learning experience preceding the graduation. This implies that even sudden shifts in work-based learning would show up only gradually over several consecutive annual data releases.

Work-based learning in VET is more widespread in certain fields of study (notably health and agriculture) than others. Around two thirds of the work-based learning experiences in the EU are paid and the majority (around six out of ten) lasted seven months or longer<sup>267</sup>. Still, there are only a few countries where such longer-term and paid apprenticeships<sup>268</sup> are the

most common form (Germany, Austria, the Netherlands and Denmark). In most other EU countries, work-based learning experiences – whether mostly paid<sup>269</sup> or mostly unpaid<sup>270</sup> – typically last up to six months, with substantial variation within countries as well<sup>271</sup>.

## Box 12. Strengthening apprenticeships as a key work-based learning approach

Apprenticeships ease the transition from education and training to work. They combine company-based training with school-based education, and lead to a nationally recognised qualification when completed. All the 27 EU countries have endorsed the European Alliance for Apprenticeships (EAfA) which aims to strengthen the supply, quality, and image of apprenticeships and the learning mobility of apprentices thereby contributing to the target on work-based learning in VET. The EAfA supports the implementation of the 14 criteria for quality and effective apprenticeships set in the 2018 Council Recommendation.

For example, Spain has recently renewed its commitment to EAfA and redefined its system within the wider transformation of the vocational training system towards a dual system, combining theoretical knowledge in school and practical training in enterprises. In 2023-2024, the number of students combining company-based training and school-based education increased up to 100%. The current Spanish system establishes that all vocational training should be dual by 2025/2026.

Other EU countries are also pursuing reforms and initiatives to further promote dual learning, in some cases as part of broader efforts covering different levels of education and training. In Belgium, Flanders aims to support work-based learning in VET by making conditions more flexible and by continuing to promote dual (school-based and work-based) learning as a high-value learning pathway for all students. The Walloon Region and the French Community will cooperate to significantly develop dual learning and apprenticeships across educational levels, including secondary, adult, and tertiary education. Bulgaria has adopted a new legal framework on work-based learning in VET. In parallel, the ESF+ is supporting schools in introducing dual VET and work-based learning, through improved teacher training, enhanced real-work practices, and targeted information campaigns. In Greece, the Apprenticeship Year for vocational upper secondary school graduates (EPAL) as well as the Apprenticeship Schools (EPAS) of PES (DYPA) combine school-based learning with paid on-the-job training. Practical training opportunities in post-secondary VET (SAEK) are increasing. Romania has set a target of transitioning all secondary VET programmes into the dual system (including a work-based learning component) by 2029-2030. Starting with the academic year 2024/2025, the possibility of dual VET was introduced for short-term higher education programmes, alongside dual programmes at bachelor, professional master's degree programmes and doctoral level.

Good progress has been made – particularly since the economic recovery from the COVID-19 pandemic<sup>272</sup> – towards achieving the 2025 EU-level target of at least 82% of recent VET graduates being in employment. Yet, the latest data reveals a minor decline from 80.9% in 2023 to 80.0% in 2024 (Figure 23). A similar drop is recorded for recent graduates from other levels of education too<sup>273</sup>, yet this is not reflected in the overall employment rates, which increased from 75.3% in 2023 to 75.8% in 2024 among the population aged 20-64<sup>274</sup>. This pattern suggests that there have been

specific challenges for young people, including VET graduates, in entering the labour market from education. Indeed, in a context of a broader slowdown in overall employment growth<sup>275</sup> since the second half of 2024, labour market entrants would be expected to be particularly affected. However, recent VET graduates having experienced work-based learning are more likely to be employed (84.3% in 2024) than those who have not (69.7% in 2024). Employment is highest where the work-based learning experience lasted longer than seven months (with 90.5% of such graduates in employment in 2024).

267 **Monitor Toolbox**

268 For more information about apprenticeship in the EU countries, see the [Cedefop database](#).

269 Estonia, Greece, Hungary, Malta, Slovenia. **Monitor Toolbox**

270 Belgium, Czechia, Spain, Croatia, Italy, Lithuania, Poland, Romania, Slovakia, Finland, Sweden. **Monitor Toolbox**

271 France has a nearly even split on payment and duration; Ireland and Portugal on payment. No data for Bulgaria, Cyprus, Latvia and Luxembourg.

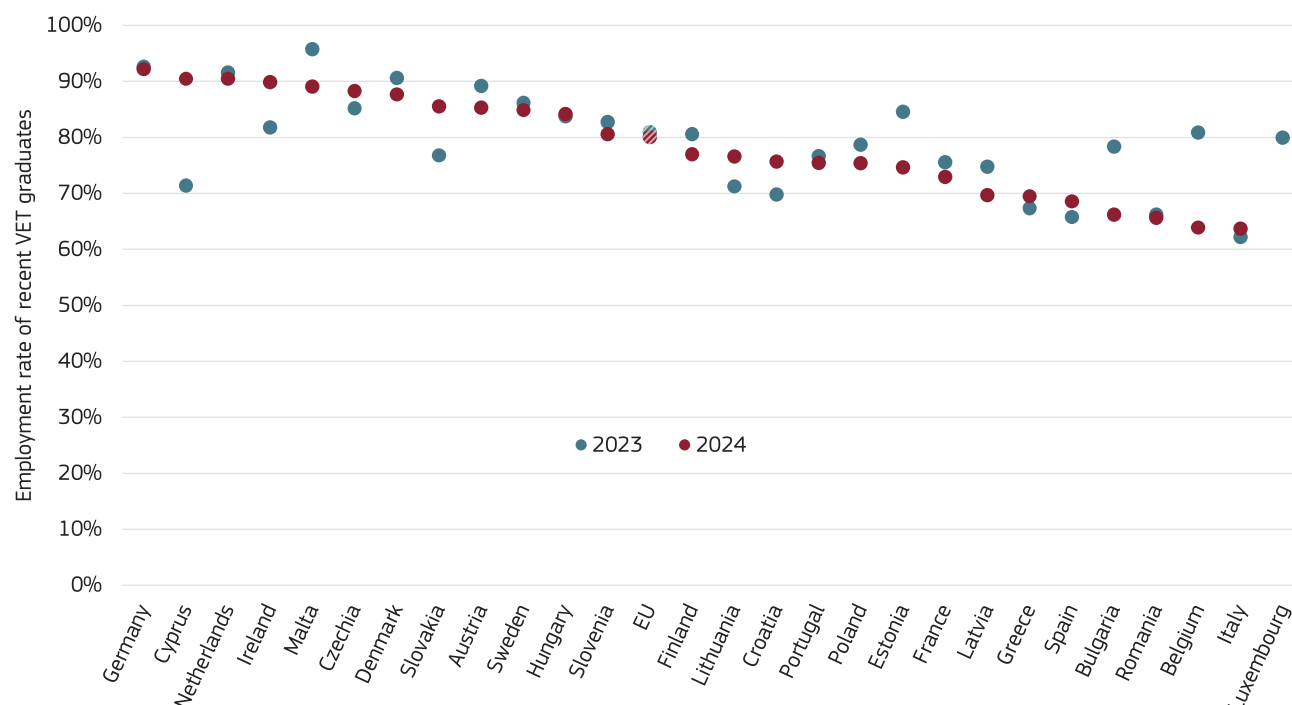
272 The economic recovery led to an increasing demand for labour and skills, resulting in a tight labour market. This improved employment prospects for VET graduates, as vocational profiles were generally in high demand.

273 The decrease in the employment rate for recent VET graduates is similar in size to that for recent tertiary graduates. In both cases, the employment rate dropped by nearly one percentage point between 2023 and 2024 (albeit from a higher level for tertiary education; from 87.7% to 86.7%). The recent decrease in employment rates was larger for graduates from medium-level education with a general orientation (from 67.8% to 62.8%) and for those who left education before completing upper secondary education (from 61.9% to 52.2%). **Monitor Toolbox**

274 While this increase was mainly concentrated among older age groups, the employment rates for young people aged 20-34 (including but not limited to recent graduates) remained stable at 71.7%. **Monitor Toolbox**

275 See a 2025 forthcoming European Commission report on labour Market and Wage Developments in Europe – Annual Review 2025.

Figure 23. **Employment rates of recent VET graduates slightly decreased in the EU on average**



Source: Eurostat (EU Labour Force Survey) [Download data](#) [Monitor Toolbox](#)

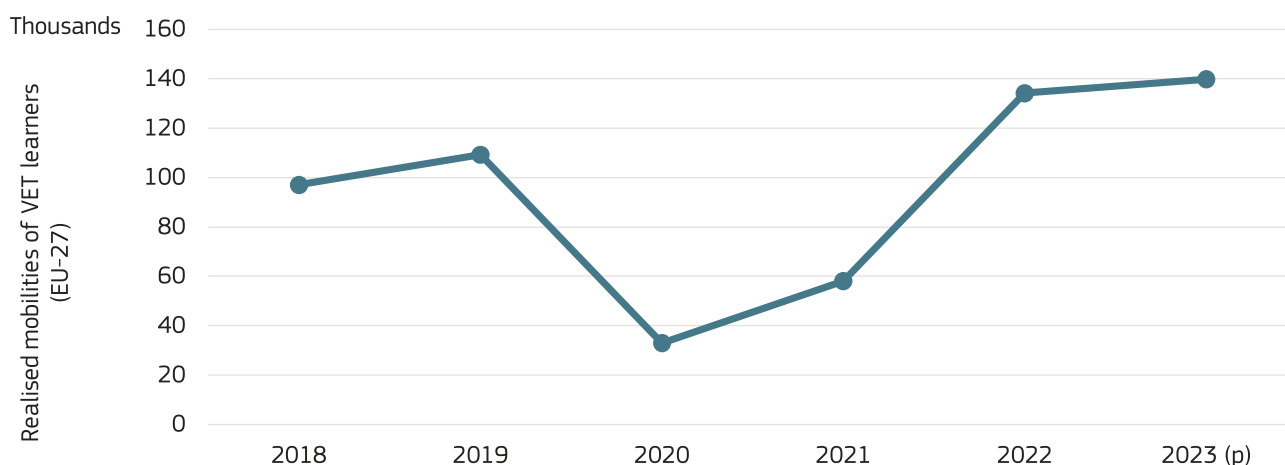
Note: The indicator captures the employment rates of 20-34-year-olds no longer in education and training, and who graduated 1-3 years previously from VET at upper secondary or post-secondary non-tertiary level. Countries shown in descending order based on the 2024 values. Breaks in time series and reliability flags available at the downloadable Excel file.

On a more positive note, the employment rates between male and female VET graduates continue to converge. The gender employment gap decreased from 6.4 percentage points in 2018 (81.9% for men and 75.5% for women) to 1.7 percentage points in 2024, mostly due to progress for female graduates<sup>276</sup>.

The EU aims to increase the number of learners in VET programmes who went abroad during their studies. Such mobility provides VET students with opportunities to learn innovative practices and technologies, foreign languages and to understand different cultures. For VET providers and other organisations active in vocational education and training, learner mobility supports internationalisation and institutional development. The 2030 EU-level VET mobility target considers flexible mobility opportunities funded under Erasmus+, such as short-term learning mobility, group mobility, blended mobility and mobility linked to participation in VET skills competitions. In 2023, around 140 000 VET learner mobility experiences in line with this definition took place. This is a slight increase from 2022, when there were 134 000 such mobility experiences. The most recent data continue an upward trajectory that was interrupted by the COVID-19 pandemic (Figure 24).



Figure 24. **Learner mobility in VET increased slightly in 2023 in the EU**



Source: European Commission calculations based on data from the Erasmus+ Dashboard). Date of extraction: June 2025 [Download data](#) [Monitor Toolbox](#)

Note: Data refer to the number of medium-level VET learners with mobility experiences abroad started in the reference period, reported in the Erasmus+ Dashboard. Due to the transition between the old and new Erasmus+ programmes, 2022 and 2023 estimates are available only at EU level and include projections based on historical data; data for 2023 are provisional.

The VET mobility target considers mobility experiences in relation to the number of medium-level VET graduates of the same year. The mobility rate stood at 5.3% in 2023, a slight increase from a year prior (5.0%), but far from the 12% target value for 2030. The rate increase in 2024 is not only due to increased mobility, but also reflects a declining number of VET graduates. This means that – in order to reach the 2030 EU-level target – any ambition to boost the number of VET graduates over the coming years will have to go hand in hand with a substantial increase in VET mobility<sup>277</sup>.

## 5.2. The links between VET and tertiary education

Traditionally, VET at the medium level of education, in other words, upper secondary and post-secondary non-tertiary education, has been the focus of VET systems<sup>278</sup>. Medium-level VET provides initial education and training to prepare young people for direct labour market entry into a specific occupation or sector<sup>279</sup>. Yet in recent years, there has been growing attention to promoting flexible pathways between VET, general school education, tertiary education and adult up- and reskilling (often referred to as 'permeability').

For learners, stronger links between VET and tertiary education could increase the attractiveness of VET programmes. Such links provide students and workers with opportunities to deepen their expertise, and gain new skills when their aspirations change or new labour market opportunities arise. For employers, VET at higher levels can be an opportunity to recruit specialised and highly qualified staff, also via work-based learning. More broadly, the agenda on '[vocational excellence](#)' emphasises the importance of local skills ecosystems, that connects the scientific community, education and training providers, businesses, and other stakeholders, to address regional and local challenges, seize opportunities, and ensure that innovative VET drives growth and competitiveness. This approach emphasises the interplay between fundamental and applied science, with practitioners playing a key role in fostering innovation.

Learners who want to access the first stages of tertiary education are typically subject to certain qualification requirements typically apply, such as having completed upper secondary education<sup>280</sup>. In many EU countries, a distinction is made between such programmes that have a general orientation and those that have a vocational orientation. Across the EU, nearly all (99.1%) graduates from general programmes have direct access to tertiary education when

277 Recent increases in the number of funding applications and contracts signed for VET learner mobility suggest that VET learning mobility will likely increase over the next few years. These are leading indicators for future (completed) learning mobility experiences. The forecasted number of applications for funding increased more strongly than the number of contracts signed (+32.3% in 2022 versus +12.8% in 2023). This mainly reflects the budgetary constraints in signing more contracts. Additional funding could support learning mobility in VET.

278 The VET targets in [Section 5.1](#) refer to these educational levels.

279 See a [2020 Cedefop report](#) on vocational education and training in Europe.

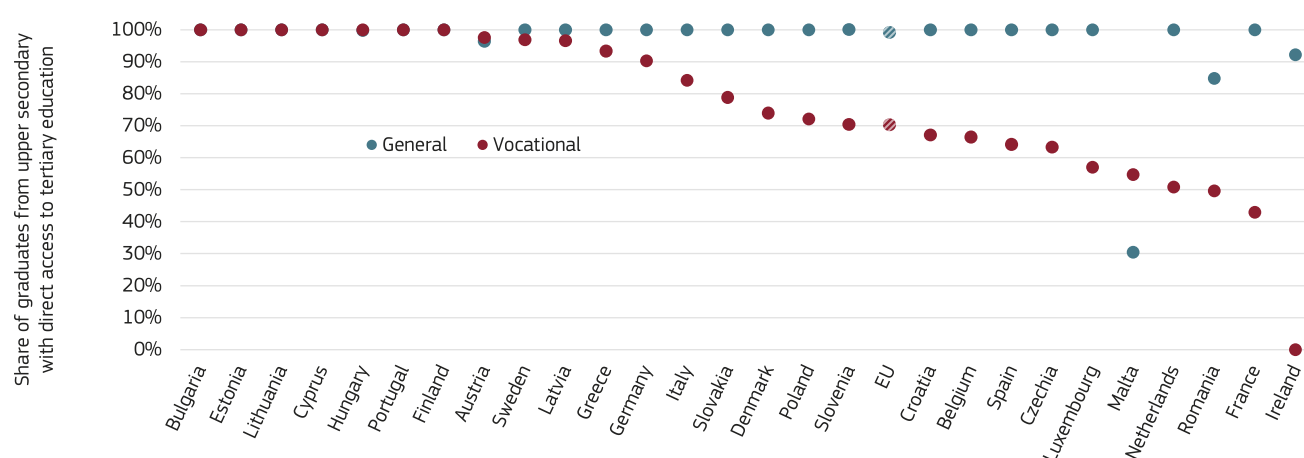
280 In addition, access may depend on other factors, such as subject choice and/or grades achieved. Furthermore, it may be necessary to take and succeed in entrance examinations for specific courses in tertiary education.



they have completed their upper secondary programme<sup>281</sup> (Figure 25), i.e. they fulfil the qualification requirements to access (a least some) tertiary programmes<sup>282</sup>. For graduates from vocational programmes, such access to tertiary education is considerably lower, at 70.2%. There are major differences across the EU in this regard, ranging from all VET graduates having direct access in some EU countries, to fewer than half in others<sup>283</sup>. Some professional bachelor

programmes are intended as a direct complement to upper secondary education. The Finnish National Qualifications Framework aligns VET qualifications with the rest of the education system, ensuring that they are formally recognised and valued<sup>284</sup>. In other systems (such as Germany), VET graduates typically gain work experience for several years in their chosen profession, before entering tertiary programmes to upskill or pass a professional examination<sup>285</sup>.

**Figure 25. Seven out of ten upper secondary VET students in the EU have direct access to tertiary education, with major differences by country**



Source: Eurostat (UOE joint data collection 2023). [Download data](#) [Monitor Toolbox](#)

Note: Only graduates from programmes leading to full level completion are considered. Data for Hungary in vocational programmes presents a certain degree of upward bias. Countries are ordered in descending order based on the share in vocational programmes.

In recent years, several countries have developed access pathways to higher education by adapting curricula for upper secondary vocational education. They have done so by providing modules or additional years of study to offer VET students the opportunity to meet the entrance requirements of higher education institutions. Other countries have introduced additional VET programmes to bridge the gap between upper secondary and tertiary education or have extended apprenticeship-like programmes to higher levels<sup>286</sup>. In Czechia, for example, there has been an increase in applications for programmes leading to a school-leaving examination that entitles VET students to apply for tertiary

studies. In Romania, the extension of work-based learning creates new opportunities for accessing higher VET.

However, direct access to tertiary education does not necessarily cover all levels of tertiary education. Spain and the Netherlands, for instance, have dedicated programmes at short-cycle tertiary level<sup>287</sup> designed to help learners progress to bachelor's and master's levels as well. Moreover, access to tertiary education might be impeded by additional factors, including formal qualification requirements for medium-level VET learners or limited information of study options. VET students may also need to strengthen their academic skills and adjust to different teaching methods. Moreover, some

<sup>281</sup> Indeed, according to [its official definition](#), the purpose of such education is to develop learners' general knowledge, skills and competencies, as well as literacy and numeracy skills, often to prepare participants for more advanced education programmes at the same or a higher level and to lay the foundation for lifelong learning.

<sup>282</sup> A notable exception is Malta where only three out of ten graduates have direct access. The share is not negligible in Romania, Ireland and Austria, albeit affecting only a minority of graduates (between four and fifteen percent).

<sup>283</sup> There are often several tracks of medium-level VET, where those with more emphasis on theoretical subjects grant access to tertiary while those that focus on practical learning do not. See the [2023 OECD Education at a Glance](#).

<sup>284</sup> See a [2025 ENESET report](#) on factors influencing STEM participation and effective intervention strategies.

<sup>285</sup> See the [2022 OECD report](#) on pathways to professions.

<sup>286</sup> For more information, see a [2023 CEDEFOP report](#) on the future of vocational education and training in Europe.

<sup>287</sup> This concerns the associate degree in the Netherlands and higher-level training cycles in Spain. See a [2025 ENESET report](#) on factors influencing STEM participation and effective intervention strategies.

VET students may have a preference or financial need<sup>288</sup> to enter the labour market earlier instead of continuing their education and training. This typically results in far fewer VET graduates entering tertiary education than those who could do so on the basis of qualification requirements alone<sup>289</sup>. For example, in Italy, more than 70% of graduates from general secondary school enrol in tertiary education, whereas only 15% from vocational tracks do.

At tertiary level, an international definition of vocational education currently only exists for 'short-cycle tertiary education'<sup>290</sup>. Indeed, this level of education is predominantly vocational (98.4% of all students enrolled across the EU<sup>291</sup>). Across the EU, enrolment in short-cycle tertiary programmes has expanded from 1 125 042 students in 2015 to 1 414 654 in 2023<sup>292</sup>. Still, it remains a relatively small section of vocational education overall (11.9%) as well as of tertiary education (7.7%)<sup>293</sup>. In specific countries, such as Spain, Latvia, France, Austria, Denmark, and Slovenia, short-cycle tertiary programmes now make up more than 10% of both the VET sector and of the tertiary education sector<sup>294</sup>.

No international definition of programme orientation currently exists at higher levels of tertiary education (bachelor, master, and doctoral)<sup>295</sup>. Rather than 'vocational' or 'general', the common approach is to distinguish between 'professional' and 'academic' programmes<sup>296</sup>. Due to a lack of internationally agreed definitions, many countries do not provide any data that disaggregate tertiary education. Nevertheless, several EU countries do provide information based on their own definitions (Figure 26). At bachelor's degree level, professionally oriented programmes make up most enrolments in the Netherlands, Denmark, Belgium and Latvia. Professional master's programmes are less widespread across EU countries, although a significant number of these programmes are offered in Latvia, France and Luxembourg.

288 Students from low socio-economic background tend to be over-represented in vocational programmes. See the [2021 OECD Education at a Glance](#).

289 See the 2023 OECD [Education at a Glance](#).

290 EU-wide, the main fields for short-cycle tertiary VET are 'business, administration and law' (22.8%) and 'services' (20.0%). 'Manufacturing, engineering and construction' comes third (16.4%), whereas it is the largest field for VET at medium level (see [Chapter 1](#)). There is a larger share of female students in short-cycle tertiary VET (49.4% female in 2023) than in medium-level VET (44.2%). [Monitor Toolbox](#)

291 [Monitor Toolbox](#)

292 [Monitor Toolbox](#)

293 'Vocational education overall' understood as vocational programmes at upper secondary, post-secondary non-tertiary and short-cycle tertiary level. Tertiary education as short-cycle tertiary level, bachelor or equivalent and master or equivalent. 2023 figures. [Monitor Toolbox](#)

294 [Monitor Toolbox](#)

295 The [2020 Council Recommendation](#) on VET includes the aim to develop vocational education and training programmes at tertiary levels to support a growing need for higher vocational skills. It should be noted that it defines such programmes based on the European Qualifications Framework (rather than educational levels). See also a [2025 UNESCO report](#) providing advice on the classification of national education programmes and related qualifications.

296 There are several difficulties in making such distinctions at higher levels of education. Most VET programmes at these levels will include theory or more academic elements, while work-based learning and other employment-oriented elements are growing in importance across different sectors of higher education. In addition, some of these professional programmes are focused on a specific profession, a broader field of activity, or even more general knowledge and research. There is substantial variability across countries, including on how courses preparing students for specific occupations are classified. See also the [2022 OECD report](#) on pathways to professions.

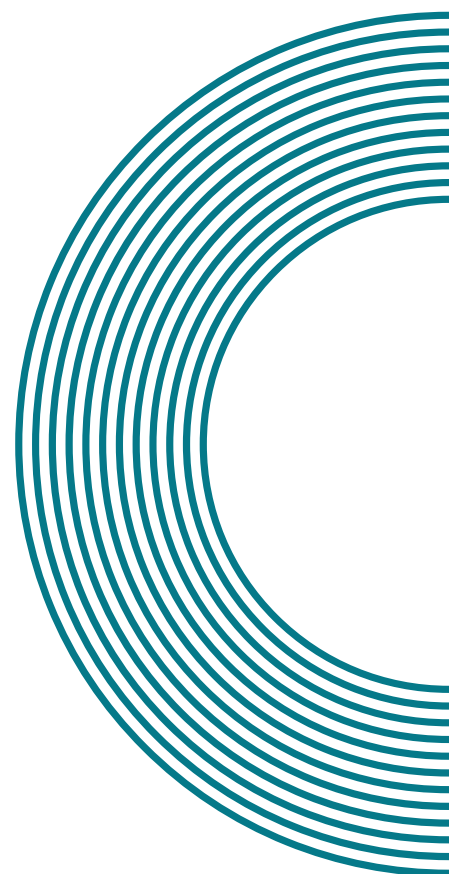
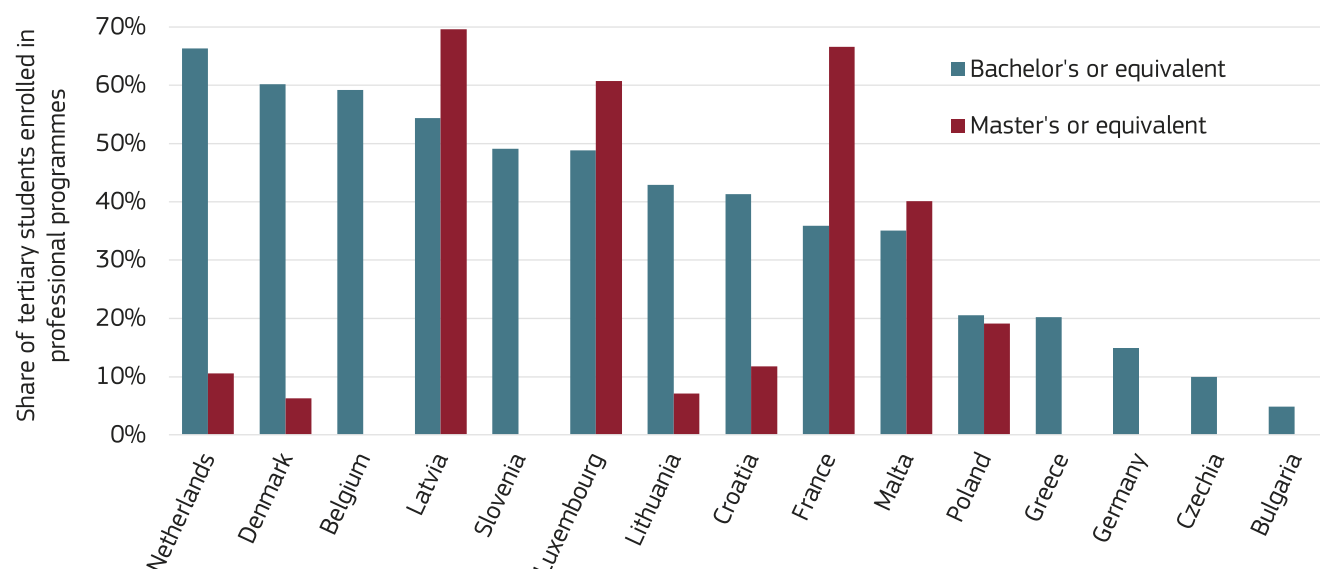


Figure 26. **Professionally-oriented programmes account for a majority of the enrolment in tertiary education in several EU countries**



Source: Eurostat (UOE joint data collection 2023). [Download data](#) [Monitor Toolbox](#)

Note: No data are available for master's or equivalent for Belgium, Bulgaria, Czechia, Greece, and Slovenia; data on both bachelor's and master's programmes are missing for Estonia, Spain, Italy, Cyprus, Hungary, Austria, Portugal, Romania, Slovakia, Finland, and Sweden. Definition differs in Luxembourg (both). Countries are shown in descending order based on the values of the bachelor's programmes.

Finally, VET at higher qualification levels may not always be part of the formal education systems or recorded as such in international education classifications. In some cases, emerging labour market needs may be addressed through shorter modules or qualifications. There have been major recent developments in this regard in Latvia<sup>297</sup> and in the Netherlands. The micro-credential VET pilot under the Npuls programme (2024-2031) co-financed by the Recovery and Resilience Facility makes the Dutch system more flexible by certifying short, recognisable, and accredited learning modules<sup>298</sup>.

## Main takeaway

Nearly two thirds (65.2%) of recent VET graduates in the EU have experienced work-based learning, which improves their employability. While the EU-level target of at least 60% by 2025 has been exceeded, a very wide dispersion across EU countries remains. Progress towards achieving the VET employability target of at least 82% by 2025 saw a minor setback, with a decrease from 80.9% in 2023 to 80.0% in 2024, part of a broader pattern of labour market slowdown. VET learners' mobility increased slightly from 5.0% to 5.3% but is not on track towards reaching the 2030 EU-level target of at least 12%. Across the EU, 70.2% of VET graduates from upper secondary education can directly access (some form of) tertiary education. While formal qualification requirements matter, they are not the only factor that influences VET learners' progression to tertiary education. Short-cycle tertiary vocational programmes have been increasing in recent years, now making up 11.9% of all VET enrolments and 7.7% of all tertiary students. In some EU countries, 'professional' bachelor's and master's programmes make up a sizeable share of overall tertiary education.

<sup>297</sup> For more information, see the 2025 Education and Training Monitor's country report for [Latvia](#).

<sup>298</sup> For more information, see the 2025 Education and Training Monitor's country report for [the Netherlands](#).



## CHAPTER 6. TERTIARY EDUCATION

Tertiary education<sup>299</sup> is a driving force for economic growth. At individual level, higher levels of education lead to better job opportunities and higher income, thereby contributing to upward social mobility. Higher levels of education are also associated with numerous benefits to society at large, ranging from democratic participation to better health outcomes, and from productivity and innovation to social trust and volunteering. Europe has seen a substantial rise in young people with a tertiary degree, spurred by a wider access to universities and a growing demand for high skills on the labour market. Labour market advantages such as lower unemployment rates and higher relative earnings are an important driver of this expansion<sup>300</sup>. The anticipated rate of return to education is a critical factor in deciding to pursue higher education and these drivers have remained stable over the last decade, despite a sizeable increase of highly educated people<sup>301</sup>. This chapter looks at latest evidence regarding the expansion of tertiary education as well as inward and outward mobility as drivers for increasing employability and attracting global talent.

### 6.1. Expansion of tertiary education

#### 6.1.1. Tertiary educational attainment



EU-level 2030 target<sup>302</sup>:  
**'The share of 25–34-year-olds with tertiary educational attainment should be at least 45% by 2030'**

During the last decade, the average proportion of 25–34-year-olds with a tertiary qualification increased from 36.5% to 44.1%<sup>303</sup> (Figure 27)<sup>304</sup>, rising by one percentage point in the last year alone. The current value is only 0.9 percentage points lower than the EU-level target of 45%<sup>305</sup> set for 2030. In ten countries<sup>306</sup>, more than half of all 25–34-year-olds now have a tertiary degree<sup>307</sup>.

299 Tertiary education covers short-cycle tertiary, bachelor's, master's, doctoral and equivalent levels of education.

300 In 2024, the average unemployment rate for young people (aged 25–34) with a tertiary educational was 5.2%, compared with 6.7% for those with an upper secondary educational attainment and 15.2% for those with lower levels of educational attainment. Likewise, workers with a tertiary degree earn approximately 52% more than those with upper secondary attainment. [Monitor Toolbox](#)

301 Returns to higher education vary between countries, within regions, by socio-economic background, sex, programme orientation and field of education. Institutional characteristics such as the prestige and resources of educational institutions have an impact too. For an overview, see a [2025 ENEEE report](#) on returns to education.

302 Originating in the [2021 EEA strategic framework Resolution](#).

303 On average 19.7% of people aged 25–34 have a master's degree, 19.6% a bachelor degree, 4.5% a short-cycle degree, and 0.7% a doctoral. [Monitor Toolbox](#)

304 Considerable differences exist between countries. The rate ranges from 23.2% in Romania to 65.2% in Ireland. Romania (–2.3 percentage points) and Finland (–1.1) are the only two countries where the tertiary educational attainment rate diminished between 2015 and 2024. [Monitor Toolbox](#)

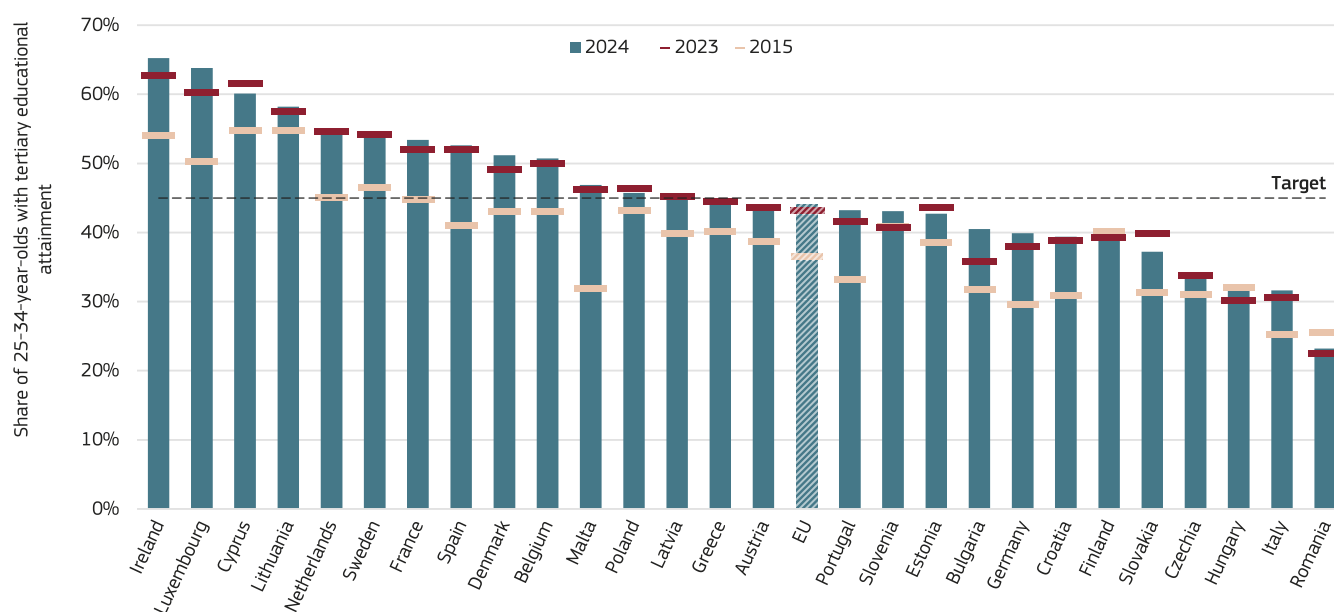
305 Against this backdrop, in 2025, the European Commission suggested further expanding the share of 25–34-year-olds with a tertiary qualification. If EU countries adopt the suggested target, the 2030 EU-level target for tertiary educational attainment will raise from at least 45% to at least 50%. See the [interim evaluation of the 2021–2030 European Area Strategic framework](#).

306 Belgium, Denmark, Spain, France, Sweden, the Netherlands, Lithuania, Cyprus, Luxembourg and Ireland. [Monitor Toolbox](#)

307 However, the latest findings from PIAAC reveal that, among tertiary-educated people (aged 25–44) literacy proficiency has declined across all EU countries taking part in the two cycles, but for Denmark, Estonia, Finland, Germany and the Flemish region of Belgium. For more information, see the [2024 OECD report on adult skills](#).



Figure 27. The EU has almost reached the EU-level target on tertiary attainment

Source: Eurostat (EU Labour Force Survey). [Download data](#) [Monitor Toolbox](#)

Note: Break in time series for Bulgaria (2024) and Slovenia (2023).

The increase between 2015 and 2024 in tertiary attainment was higher among women (8.0 percentage points) than men (7.4). Women with a tertiary degree now make up almost the majority of female 25–34-year-olds, at 49.8% of compared with 38.6% of their male peers (an average 11.2 percentage point gender gap). This gender gap surpasses 20 percentage points in Croatia (20.5), Estonia (21.6), Latvia (22.9) and Slovenia (23.7). The gap increased very slightly by 0.6 percentage points between 2015 and 2024. Most EU countries recorded an increase in the gender gap as well<sup>308</sup>. The dynamics behind this gender gap are complex and multi-faceted. Three examples are worth flagging. Firstly, a larger share of boys is enrolled in vocational programmes, sometimes without direct access to tertiary education (Section 5.2). Secondly, girls are less likely to leave before completing upper secondary education (Section 4.1.2). Thirdly, women gain more from pursuing tertiary education due to the substantially higher unemployment rates they face with just upper secondary educational attainment when compared with men.

Other examples of under-represented groups<sup>309</sup> are limited by the availability of cross-EU comparative data. Adults aged 25–34 born outside the EU are the least likely to have obtained a tertiary degree (38.5% in 2024)<sup>310</sup>. The results are 4.0 percentage points higher for adults born in another EU country and increase to 45.2% for adults born in the reporting country. However, the rate for people born outside the EU has increased by 11.4 percentage points since 2015 and the gap between them and people born in the reporting country shrank by 3.7 percentage points (from 10.7 in 2015 to 7.0 in 2024). This decrease could be associated with the higher focus on the inclusion of under-represented groups in higher education. Almost all EU countries have a strategy in place to improve access for those groups (see Section 6.1.2). Nevertheless, the gap between native-born and non-native born people remains relatively high. People with migrant backgrounds often face challenges that make it harder for them to participate in and complete tertiary education, including language barriers, financial constraints, and a lack of access to information and support systems. Another obstacle and an explanation for a lower tertiary attainment rate could be the lack of recognition<sup>311</sup> of qualifications acquired in third countries.

308 Between one and three percentage points in Portugal, Slovenia, Czechia, Sweden, Italy, Bulgaria, and Slovakia, 3.6 in Germany, 4.2 in Greece and more than five points in Croatia, Austria and Malta. [Monitor Toolbox](#)

309 Among underrepresented groups, people with disabilities are more likely to face barriers in accessing and completing tertiary education, resulting into lower attainment rates compared to people without disabilities. In 2024, only 30.0% of persons aged 25–34 years experiencing some or severe limitations in their daily life held a tertiary degree.

310 [Monitor Toolbox](#)

311 Increasing comparability with European qualifications, while also offering bridging courses to help migrants complement the education acquired abroad, remains crucial to a fairer inclusion of migrants and to enable them to fully use their competences and skills. Progress on this side is being made with some EU countries taking steps to recognise skills and academic qualifications. For more information, see [the 2021–2027 Action Plan on Integration and Inclusion: and, the 2023 Annual Report on Migration and Asylum](#).

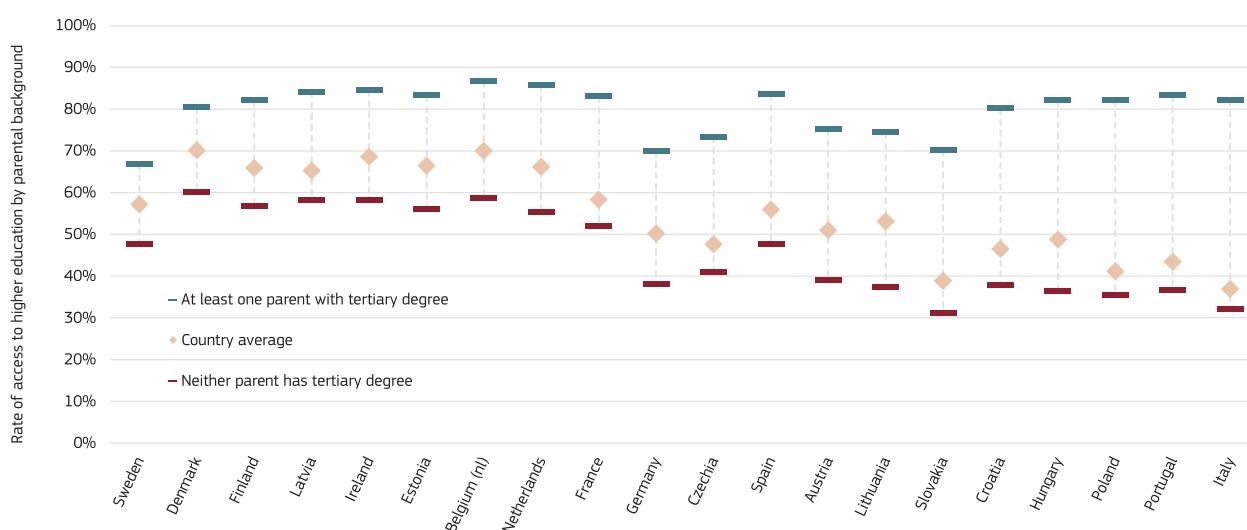


Results for rural areas also improved over the past decade, rising from 26.9% in 2015 to 32.2% in 2024<sup>312</sup>. However, the gap between rural and urban areas increased by 3.1 percentage points on average and by up to 10 percentage points in Hungary. The concentration of universities in urban areas attracts students, while the high demand for highly qualified workers, with the added wage premium, attracts those with a tertiary education and makes it easy for them to find a job matching their skills. At the same time, firms are also more likely to find the skills they need in such areas. The increase in the rural-urban gap may be due to the fact that challenges, such as climate transition, demographic decline and technological transformation, are impacting the EU's poorer regions more heavily<sup>313</sup>, making them even less attractive to people with a tertiary qualification and businesses.

### 6.1.2. Broadening participation in tertiary education

The 2023 OECD Survey of Adult Skills, a product of its Programme for the International Assessment of Adult Competencies (PIAAC), confirms that larger shares of 25-44-year-olds from a disadvantaged background have had access to tertiary education when compared with the previous cycle of the survey<sup>314</sup>. However, Figure 28 reveals that the gap in access to higher education between 25-44-year-olds with a higher parental educational background and those with parents without a tertiary qualification remains high. This gap ranges from around 20 percentage points in Sweden and Denmark (19.2 and 20.2 respectively) to more than 45 percentage points in Poland, Portugal and Hungary, and up to 50 in Italy<sup>315</sup>.

Figure 28. Parental background exerts a high influence on access to tertiary education



Source: European Commission calculations based on the OECD Survey of Adult Skills 2023. [Download data](#) [Monitor Toolbox](#)

Note: In this calculation, a person is considered to have entered a higher education institution if they have: completed tertiary education; or, completed formal education at post-secondary non-tertiary education or lower, but at the time of the survey were enrolled in tertiary education; or completed school education and were not studying at the time of the survey, but had enrolled at least once in their lives at a higher education institution without completing the study. The countries are listed in ascending order based on the gap by parental background.

Broadening participation to traditionally disadvantaged or otherwise under-represented groups is a priority. Almost all<sup>316</sup> EU education systems have a strategy in place to increase

the participation for under-represented groups covering all higher education institutions. The rest of this section looks at three major policy responses<sup>317</sup>.

312 [Monitor Toolbox](#)

313 For more information, see the [Ninth report on economic, social and territorial cohesion](#). To address the challenges of rural areas, the EU developed [a long-term vision for rural areas](#).

314 Note that this comparison only focuses on those education systems for which data are available in both cycles: the Flemish community of Belgium, Finland, Hungary, Italy, Ireland, Lithuania, Poland, Slovakia and Spain. [Monitor Toolbox](#)

315 Moreover, this access gap is accompanied by a skill gap. Among 25-44-year-olds with a tertiary degree, those from higher parental backgrounds show higher literacy skill levels compared to their counterparts from lower parental backgrounds. This skill gap may result from differences in university access as well as different career and training opportunities after graduation.

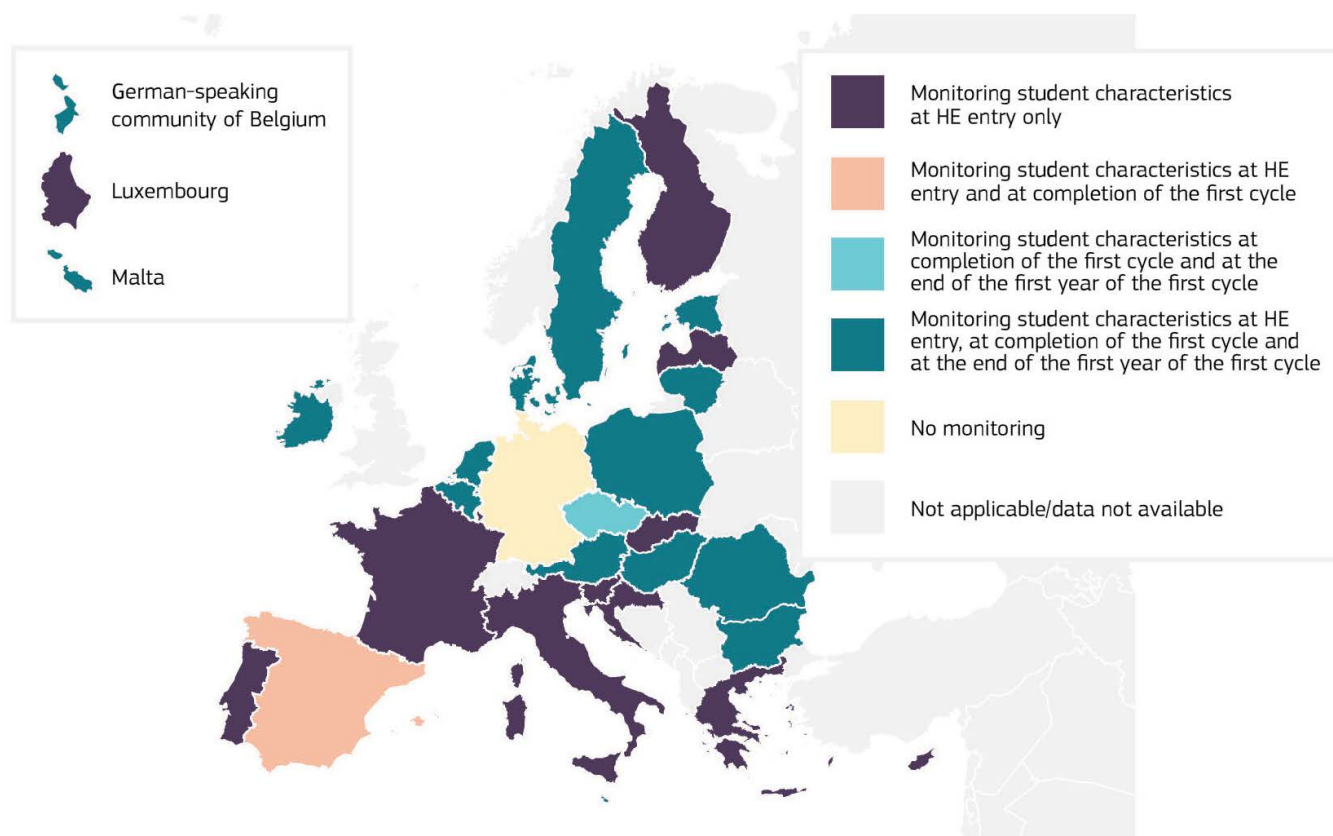
316 All EU education systems but for the Flemish and German communities of Belgium, Germany, Cyprus, Latvia, Luxembourg, Slovenia and Sweden. These countries may have a strategy for increasing participation but it may not cover all higher education institutions. For more information, see the [2025 Eurydice system-level indicators](#) for tertiary education. [Monitor Toolbox](#)

317 For other examples to broaden participation in tertiary education, see the [2024 Bologna process implementation report](#). The 2024 Education and Training Monitor's [comparative report](#) looked at tuition fees and other costs such as accommodation and transport. According to a [2025 ENESET report](#) on equity and inclusion in higher education, addressing both monetary and non-monetary barriers and adopting consistent approaches at the national and institutional level can improve access among underrepresented groups.

Firstly, data collection is essential. With the expansion of tertiary education, the student population has become more diverse, adding up to new needs among students. Systematically collected data, for instance on the composition of the student body, access, participation, dropout, completion as well as transition to the labour market, can

provide evidence to education authorities on how to address these new needs and on the effectiveness of measures aiming to improve the inclusiveness of higher education. Figure 29 shows whether education systems monitor any student characteristics other than age and gender at various moments during tertiary programmes.

Figure 29. **Only a few EU countries monitor student characteristics after students enter tertiary education**



Source: BFUG data collection. [European Commission / EACEA / Eurydice, 2024](#). [Monitor Toolbox](#)

Most EU education systems collect data on students when they enter tertiary education. However, 11 systems do not collect such data beyond that point<sup>318</sup>. This risks not having enough information to develop targeted interventions to support students effectively<sup>319</sup>. Especially during the first year, students are vulnerable, and more at risk of dropping out (see Box 13). The transition to tertiary education poses several challenges for first-year university students. Academically, students may be navigating increased difficulty and independence, adapting to new teaching styles,

larger class sizes and more rigorous expectations. Financially, students may become responsible for managing their own finances, including budgeting for tuition, accommodation, textbooks and living expenses. Socially, students may face the challenge of integrating into a diverse community while managing social expectations. As a result of all these challenges, mental health is a critical concern, as the pressure to succeed, combined with environmental adjustments, can exacerbate issues such as stress, anxiety and depression. Disadvantaged learners are particularly vulnerable<sup>320</sup>.

318 Croatia, Cyprus, Finland, France, Greece, Italy, Latvia, Luxembourg, Portugal, Slovakia and Slovenia. [Monitor Toolbox](#)

319 More data also helps design better counselling and guidance interventions both before and after students enter tertiary education. For more information, see a [2025 ENESET report](#) on equity and inclusion in higher education.

320 For instance, students whose parents have lower levels of education have lower on-time completion rates. See the OECD's [Education at Glance 2025](#). [Monitor Toolbox](#)

### Box 13. Tackling dropping out of higher education<sup>321</sup>

University dropout is typically a gradual process influenced by interlinked factors such as financial constraints, socio-economic background, academic preparedness, institutional barriers, social isolation, and a mismatch between student expectations and reality. For individuals, dropping out disrupts personal and professional growth; for society, it results in a misallocation of public funds. Across the EU25, 13.4%<sup>322</sup> of students leave their bachelor's programme in the first year, with the highest rates in the French Community of Belgium (21.1% for University colleges and Higher school arts), and Romania (21.1%), and the lowest rates in Finland (5.4%) and Hungary (5.6%). In contrast, dropout rates in master's programmes are significantly lower, indicating a better alignment between student expectations and academic paths.

Financial difficulties are the strongest predictor of dropping out. High living costs and limited financial support particularly impact students from disadvantaged backgrounds, many of whom balance work and studies. Need-based grants and scholarships that cover tuition fees and living expenses are proven measures to increase retention. Several European countries have expanded grant programmes for vulnerable students. For instance, Germany's BAföG scheme offers financial aid based on income and assets, providing higher amounts to lower-income families, with special provisions for students with disabilities or children.

Socio-economic factors often intersect with academic preparedness. Students from disadvantaged or migrant backgrounds may struggle due to lower student outcomes and a lack of parental guidance that can ease entry into higher education. This seems to affect STEM fields in particular. Mathematics is a subject where such students are more likely to face difficulties, which increases dropout rates and affects timely completion. In the EU25, only 62.9% of tertiary education students complete a STEM degree within three years of the theoretical end, a lower rate than in other fields. When academic difficulties contribute to students' dropping out, interventions should focus on enhancing their skills, performance, and engagement with the curriculum. Proactive advising, which includes personalised outreach and early supportive conversations, is effective in identifying at-risk students before issues escalate. Many universities and countries employ early warning systems that track indicators like attendance and grades and offer support such as tutoring, workshops, or mentorship. In 2023, Estonia<sup>323</sup> launched the Engineering Academy initiative to reduce dropout in STEM fields, focusing on early risk detection and individual support, such as supplementary mathematics course for first-years students and a mentorship programme.

Institutional factors also affect retention. Teaching quality, class size, and student-teacher relationships strongly influence motivation and success. Programme structure and scheduling can impact withdrawal when inflexible systems clash with students' work or family obligations. Allowing students to explore alternative academic pathways and implementing flexible schedules address diverse needs. For instance, under the 'Impulso Mais Digital Programme', Portugal<sup>324</sup> aims to increase completion rates and reduce dropout rates by requesting that universities establish mentoring and monitoring mechanisms, diversify teaching methods, and strengthen self-directed learning and teamwork among students.

Social integration is another key determinant of dropping out, as disconnected students are more likely to drop out. Improving the campus climate, student engagement, and the student-university relationship are essential. Initiatives like first-year seminars, orientation courses, and learning communities help integrate students. Inclusive policies, such as training staff on bias and providing networks for first-generation students, foster a sense of belonging.

A mismatch between students' expectations and their chosen academic path contributes to their dropping out. Misalignment can arise from insufficient career guidance or unrealistic academic expectations. Studies reveal that a poor choice of field is a common reason for considering dropping out.

Given the increasing awareness of mental health issues among students, accessible psychological counselling is crucial to prevent dropping out. On-campus counselling centres, stress management workshops, and peer support groups help students deal with personal challenges.

Effectively preventing students from dropping out requires a targeted, evidence-based approach that takes the multifaceted causes of dropping out into account. Since students rarely suddenly decide, continuous engagement is needed. New national initiatives are beginning to reflect these insights. For example, a 2024 project in Poland<sup>325</sup>, co-funded by the EU, aims to reduce dropout by collaborating with secondary schools, enhancing career counselling, providing remedial and hybrid classes, and offering psychological and financial support to at-risk students.

Secondly, more flexibility benefits anyone who wishes to study for a tertiary education degree, but finds the conventional access route (via upper secondary schools) and progression mode (full-time studies requiring physical presence) unsuitable. The main forms of flexible study

programmes are part-time studies, distance learning and blended learning. All<sup>326</sup> EU education systems allow higher education institutions to offer part-time studies, blended or distance learning programmes.

321 See the [2025 ENESET ad hoc report](#) tackling dropout from higher education.

322 For more information, see the 2025 [OECD's Education at Glance](#). The EU25 average does not include Cyprus and Malta. [Monitor Toolbox](#)

323 For more information, see the 2025 Education and Training Monitor's country report for [Estonia](#).

324 For more information, see the 2025 Education and Training Monitor's country report for [Portugal](#).

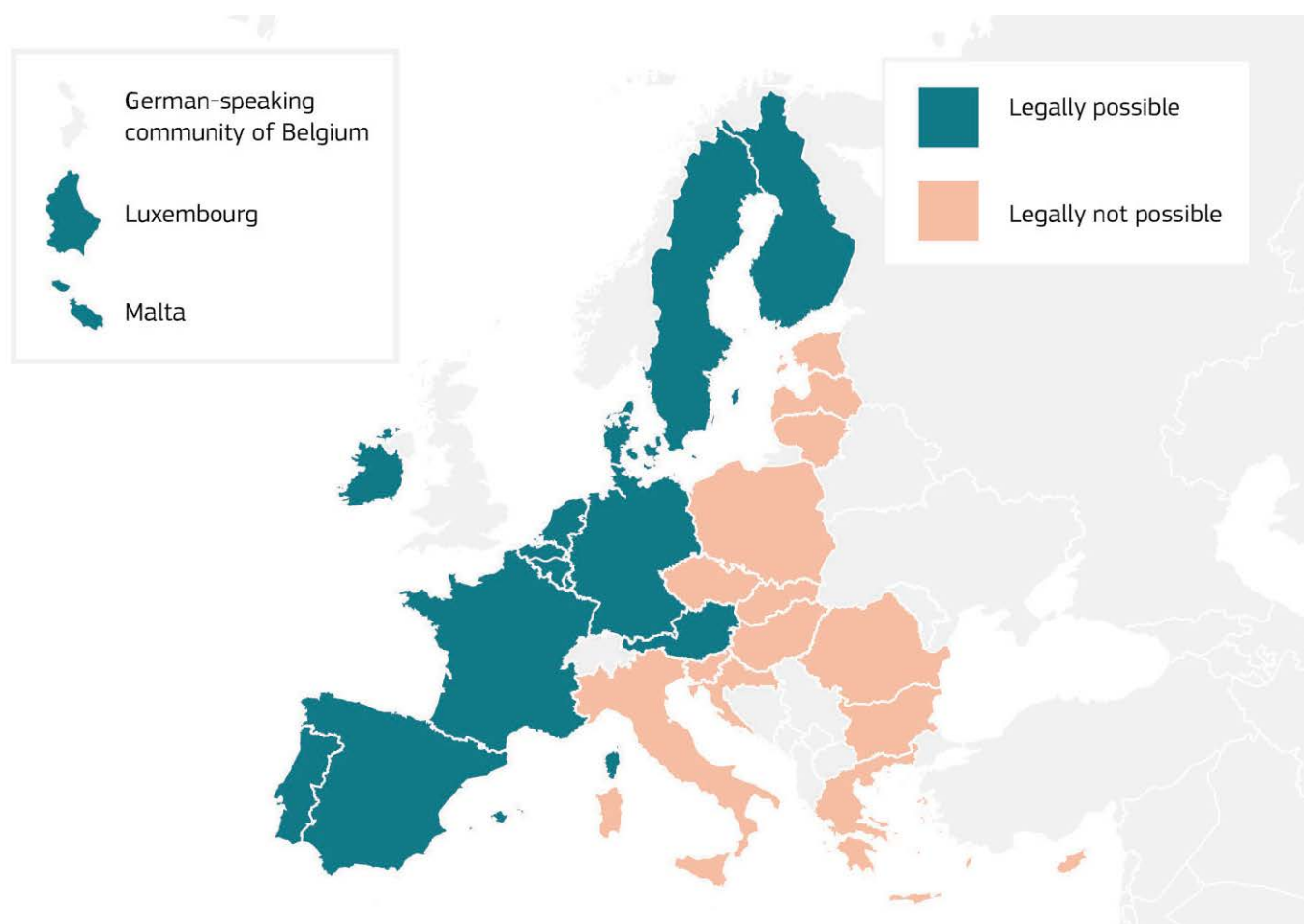
325 For more information, see the 2025 Education and Training Monitor's country report for [Poland](#).

326 However, there are some exceptions. Only private institutions are allowed to provide these flexible study modes in Cyprus. Latvia and Croatia apply some restrictions for distance learning. For more information, see the [2024 Eurydice report](#) on the implementation of the Bologna process. Moreover, it is important to note that higher education institutions enjoy autonomy. When the regulation allows for flexible study programmes, then it is the responsibility of individual institutions to design and operate them. For more information, see a [2022 Eurydice report](#) on equity and inclusion in higher education.

Thirdly, validating knowledge and skills acquired in non-formal settings<sup>327</sup> (such as in-work training and structured online learning), or in informal settings (such as self-learning) is another driver for broadening participation in tertiary education<sup>328</sup>. It gives a second chance to students who left school without completing upper secondary education (see [Chapter 4](#)) or who followed a short upper secondary vocational path that did not give direct access to tertiary

education<sup>329</sup>. This can help increase equity and diversity, as students with disadvantaged socio-economic backgrounds tend to be over-represented in educational pathways that do not give direct access to tertiary education<sup>330</sup>. However, Figure 30 shows that no fewer than 14 education systems do not give students without traditional entry qualifications access to bachelor's programmes.

**Figure 30. Only in half of all EU education systems validate non-formal and informal learning to allow access to tertiary education programmes**



Source: [2024 Eurydice report](#) Monitor Toolbox

Note: The indicator covers only those cases where the validation of non-formal and informal learning can replace (rather than being in addition to) traditional tertiary education entry qualifications; the indicator does not cover those cases where the validation of non-formal and informal learning is legally possible only for entry to some specific programmes that commonly use talent screening (such as programmes in the arts or in sport).

327 Non-formal and informal learning are generic terms encompassing many different learning activities. For country-specific information, see a [2024 Eurydice report](#) on the validation of non-formal and informal learning.

328 Besides the validation of non-formal and informal learning, countries can also offer other ways to enter tertiary education to those who do not have formal entry qualifications. For instance, some EU education systems offer the possibility of taking an entrance exam or admission test: the French and Flemish communities of Belgium, Spain (two different options for learners over the ages of 25 and 45), the Netherlands (for learners above the age of 21), Austria and Portugal (for learners over the age of 23). Preparatory higher education programmes leading to alternative entry qualifications exist in the Flemish community of Belgium, Germany, Ireland, Spain, and Malta. For country-specific information, see a [2024 Eurydice report](#) on the validation of non-formal and informal learning.

329 Another way to use the validation of non-formal and informal learning is to exempt learners from some (or potentially all) higher education study requirements if they demonstrate that they already possess the knowledge and skills relating to a specific higher education programme or qualification. This, in turn, can reduce compulsory participation in formal higher education courses and, consequently, facilitate and accelerate the completion of studies. For more information, see a [2024 Eurydice report](#) on the validation of non-formal and informal learning.

330 For more information, see the OECD's [Education at Glance 2021](#).

Yet even in systems where it is possible to validate non-formal and informal learning, regulatory restrictions on providing access to non-traditional students might still apply. In Austria, for instance, validated non-formal and informal learning grant only access to universities of applied sciences. Another potential restriction is on the categories of students eligible for this alternative access route. In Spain, it is restricted to individuals over the age of 40, while in Portugal, the minimum age is 23<sup>331</sup>.

## Main takeaway

Tertiary education plays a crucial role in driving economic growth and in contributing to upward social mobility. Over the past decade, there has been a significant rise in tertiary educational attainment as a result of improved access and demand for skilled labour. The average share of 25–34-year-olds with a tertiary qualification has increased from 36.5% in 2015 to 44.1% in 2024. In ten EU countries, more than half of all 25–34-year-olds now hold a tertiary degree. However, disparities still exist by sex, country of birth, degree of urbanisation, region, disability, and parental background. Monitoring diversity in tertiary education is crucial to understanding and addressing the needs of a more varied student population, and improving retention and completion rates.

## 6.2. Learning mobility in tertiary education

### 6.2.1. Going abroad



EU-level 2030 target<sup>332</sup>:

**'The share of tertiary graduates with a learning mobility experience abroad should be at least 23% by 2030'**

Going abroad to study or to train is commonly associated with an increased motivation to continue education, future mobility, better income prospects, and higher employability. It enhances key transferable skills, including foreign language proficiency, and cultural awareness<sup>333</sup>. Participating in student exchanges has a positive impact on students' awareness of global issues. Additionally, student exchanges raise higher education institutions' international profiles through collaborations, diversity and academic reputation.

The outward mobility rate<sup>334</sup> declined by 2.5 percentage points<sup>335</sup> between 2020 and 2023. Only 11.0% of the 4 million tertiary education graduates originating from EU countries were mobile in 2023, with 4.4% going for a full degree abroad<sup>336</sup> whereas around 6.6% went for credit mobility. As such, EU average graduate outward mobility remains far below the 23% target set for 2030<sup>337</sup>. However, several data limitations persist, which may result in a progress towards reaching the target being underestimated<sup>338</sup>.

331 For more information, see a [2024 Eurydice report](#) on the validation of non-formal and informal learning.

332 Originating in the [2024 Council Recommendation](#) 'Europe on the Move'.

333 Based on Erasmus monitoring data, 77.2% of participants in Erasmus mobility have declared having improved their foreign language competences, 73.5% have increased cultural awareness and expression, while 79.4% have improved their personal and social skills and 64.3% their entrepreneurship capacity. For more information, see the [2024 European commission](#) report on the interim evaluation of Erasmus.

334 The indicator records learning mobility at all levels of tertiary education, from short-cycle tertiary education to doctoral or equivalent level; for country X, the indicator is calculated as the number of mobile graduates originating in country X (either credit or degree mobile), expressed as a percentage of all graduates whose country of origin is country X (i.e. graduates who obtained their upper secondary diploma in country X). Credit and degree mobility rates are computed considering only one of the components as the numerator. At EU level, the outward mobility rate is computed using the number of EU originated mobile graduates expressed as a percentage of the number of EU originated graduates.

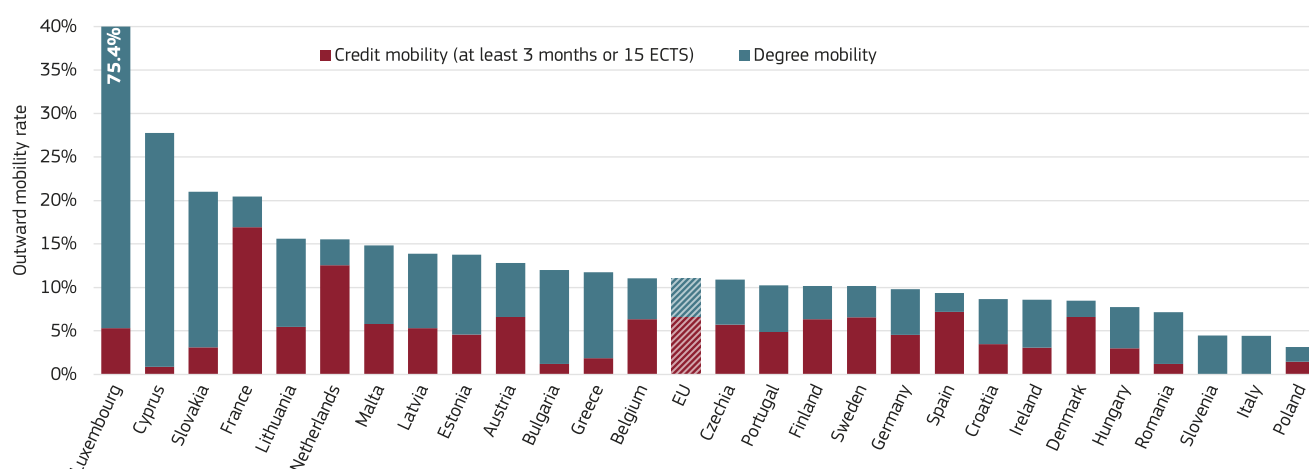
335 The decline is due to a drop of 2.5 percentage points (from 9.1% in 2020) in the rate of credit mobile graduates, whereas the rate of outward degree mobility remained stable between 2020 and 2023 (+0.1 percentage points). [Monitor Toolbox](#)

336 Degree-mobile graduates are those whose country of origin, understood as the country where they obtained the diploma granting them access to tertiary education is different from the country in which they graduated. Credit-mobile graduates are those who have had a temporary study period and/or work placement abroad and return to their 'home institution' to complete their degree.

337 The target refers to worldwide outward mobility. In other words, mobility from EU countries to both EU and non-EU destinations. It includes: (i) outward degree mobility; (ii) outward credit mobility of a minimum of three months or 15 European Credit Transfer and Accumulation System (ECTS) credits (including both traineeships and study mobility); and (iii) shorter outward credit mobility of less than 3 months and at least 3 ECTS credits. These mobility experiences can be fully physical or blended (consisting of both a virtual and physical component).

338 Firstly, degree mobility is reported by the destination country (where graduates obtain their tertiary degree), meaning that EU countries are dependent on non-EU countries' often limited reporting. Secondly, shorter credit mobility experiences are reported only by a minority of EU education systems (the Flemish community of Belgium, Czechia, Estonia, Spain, Cyprus, Latvia, Lithuania, Malta, Austria, Romania, Slovenia, Slovakia, Finland and Sweden) and concern all mobility lasting less than three months, regardless the minimum number of ECTS credits. Thirdly, there is a risk of double counting because degree mobile graduates who also went abroad for a short credit mobility stay cannot be singled out in the data. Therefore, data on shorter credit mobility are excluded from the calculations mentioned in this chapter.



Figure 31. **Outward mobility remains limited**

Source: European Commission calculations based on the UOE joint data collection 2023. [Download data](#) [Monitor Toolbox](#)

Note: The indicator captures learning mobility at all levels of tertiary education, from short-cycle tertiary education to doctoral or equivalent level; for detailed source information, as well as explanations and caveats regarding the indicator, see the downloadable Excel file.

Figure 31 confirms that the share of outward-mobile graduates differs considerably by country. Luxembourg (80.7%) and Cyprus (27.8%) achieved the 2030 EU-level target, while Poland, Italy and Slovenia recorded proportions below 5%. The total proportions are driven by different types of mobility depending on the country<sup>339</sup>. Moreover, on average, the higher the education level, the higher the shares of outward mobility. Across the EU, 3.3% of graduates in short-cycle degrees were mobile in 2023. The outward mobility rate increases to 9.7% at bachelor's level, 14.9% at master level, and up to 18.8% at doctoral level.

Credit mobility<sup>340</sup> in the EU is generally associated with the EU programmes (i.e. Erasmus and other EU programmes)<sup>341</sup> but a sizeable share (46.0%) of short study periods or traineeships abroad is also organised independently<sup>342</sup>. In France and Denmark, among the graduates who were credit mobile, the share of those who spent a short period abroad under 'other programmes' was higher than 60% in 2023. In contrast, EU programmes seem to be virtually the only possibility for going abroad for a short period in Latvia,

Hungary, Bulgaria, Romania and Cyprus. Over 97% of credit-mobile graduates originating from these countries went abroad under EU programmes<sup>343</sup>.

## 6.2.2. Choosing Europe

Proposed EU-level 2030 target<sup>344</sup>.  
**'By 2030, the annual number of learners from outside the EU coming to study and obtain a degree at tertiary level in the EU should be at least 350 000'**

Inward learning mobility is one of the options for attracting global talent and enriching the stock of human capital available in the EU<sup>345</sup> to boost innovation, fill labour shortages in high-level occupations and offset the workforce's decline, particularly when graduates stay<sup>346</sup> to work or do research in the EU. Compared with other types of highly skilled migrants, international students who stay after graduation may offer particular advantages to their host country because they are

339 For instance, credit mobility represents more than three quarters of the total share of outward mobility in France, the Netherlands, Denmark and Spain. [Monitor Toolbox](#)

340 This paragraph refers to all credit-mobile graduates who spent no less than three months abroad and who may also have been degree mobile. In other words, the data do not match the credit mobility component used to monitor progress towards reaching the 2030 EU-level target.

341 Other EU countries are frequently the preferred destination for credit mobile graduates. On average, around half of credit mobile graduates (52.2%) spent their short period (of at least three months) of study or training in another EU country. Only in France (57%), Denmark (56.9%) and up to a lesser extent Sweden (51.9%) and Latvia (50.2%), do credit mobile graduates who choose a non-EU country outnumber those who stay in the EU.

342 [Monitor Toolbox](#)

343 Limited availability of private resources to finance a short period abroad and a lack of multilateral and bilateral exchange programmes at the national or institutional level could be the main reasons. Such difficulties may also explain the small share (lower than 2%) of credit-mobile graduates in these countries.

344 Proposed in the [Union of Skills](#).

345 For host countries and institutions, mobile graduates may also be an important source of income as they often pay higher tuition fees and contribute to the local economy through their living expenses.

346 Retention rates determine the size of the long-term benefits of inward mobility, which can outperform any short-term costs paid by the host country. The exact number of who stays in the EU after graduation is not known and evidence is mostly country specific. Retention rates appear much higher for PhDs graduates, and are affected by economic aspects, visa policies and more personal constraints and choices. For further details, see a [2022 OECD report](#) on international migration; a [2022 IZA paper](#) on how to attract international students; and a [2023 review](#) of international student mobility and its impact on destination countries.

often highly proficient in the host country's language, they have higher education qualifications that are fully recognised in the domestic labour market, and they are also likely to have a good understanding of local cultural and professional norms and practices. These advantages are likely to help such individuals integrate successfully into the labour market and to boost their productivity<sup>347</sup>.

Moreover, the current geopolitical context provides the EU with unexpected opportunities to become a global magnet for talent. With all this in mind, the [Union of Skills](#)<sup>348</sup> includes a proposal for a 2030 target to increase the number of learners from outside the EU coming to study and obtain a degree at tertiary level to 350 000.

In 2023, the EU had 249 340 inward mobile tertiary graduates coming from a non-EU country<sup>349</sup>. This figure grew by 18.2% at EU level between 2020 and 2023<sup>350</sup>, despite the COVID-19 pandemic and its limitations on global movements<sup>351</sup>. The rise at EU level was mainly driven by an increase at master's level (21.0%) and bachelor's level (20.5%)<sup>352</sup>.

Extra-EU inward mobility is highly unbalanced across EU countries<sup>353</sup>, with the top three destination countries also being among the largest countries in the EU (France, Germany and Spain). Together, these three countries cover almost 58.7% of all extra-EU inward mobile graduates. France alone attracts 32.3% of extra-EU degree mobile graduates, Germany 19.0%, while the next most attractive, Spain, receives only 7.5% of them. Poland and Italy have shares of around 6%, the Netherlands and Ireland around 4% each, while the rest of the EU countries attract less than 3% of all extra-EU degree mobile graduates each.

Approximately four out of ten extra-EU inward mobile graduates originate from Asia (37.3%)<sup>354</sup>, with 11.1% coming from China, and 7.7% from India. Africa is the region of origin of 26.3% of extra-EU inward mobile graduates, with 70.9% of those graduates choosing to obtain their degree in France in 2023 (Figure 32). France is also the main EU destination in which about one third (32.6%) of Chinese students choose to graduate, followed by Germany (27.5%). 37.6% of Indian students choose to graduate in Germany, followed by Ireland (14.4%) and France (13.1%). Extra-EU inward mobile graduates coming from non-EU European countries make up 19.8% of the total; including 2.0% from the United Kingdom and 4.6% from Ukraine. More than half (52.9%) of graduates of Ukrainian origin graduated in Poland in 2023. Only a small portion of extra-EU inward mobile graduates comes from the United States (2.8%). Half of them (50.4%) are distributed among Germany (19.8%), Ireland (15.1%) and France (15.6%). The other American countries represent 13.6% of the total extra-EU inward mobile graduates, around half of them graduating in Spain (37.4%) and France (19.5%).

347 For further details, see a [2022 IZA paper](#) on how to attract international students.

348 With the initiative [Choose Europe](#), the EU is also stepping up its efforts to become a more attractive destination for researchers, including doctoral students, offering them attractive careers as well as better working conditions.

349 There were, in addition, 20 401 graduates in the EU whose origin is not available [Monitor Toolbox](#)

350 This translates into 38 467 more graduates compared with 2020. Around half of the increase is explained by the rise in the number of graduates originating in Asia (+16 715), who represent in 2023 around one third (37.3%) of the total number of non-EU mobile graduates. Their preferred destinations were Germany and France where 29.4% and 24.0% of the total of graduates coming from Asia completed their study, respectively). [Monitor Toolbox](#)

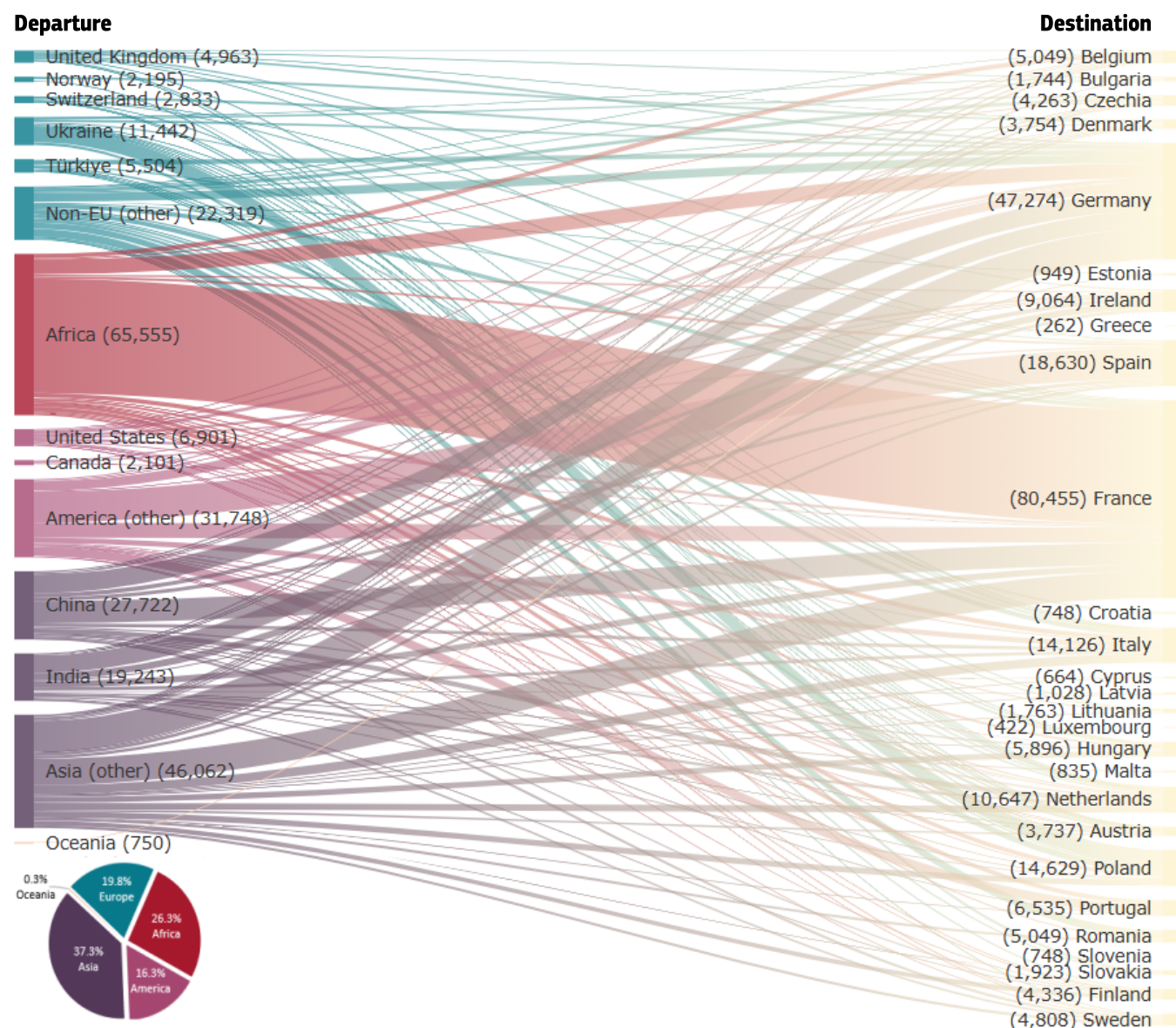
351 Global movements were affected but higher education institutions and countries changed their rules to allow online enrolment and remote learning. Moreover, countries revised visa regulations, extended work opportunities and targeted financial aid. In addition, people who graduated during the pandemic could have been enrolled before the start of the pandemic in 2020. This may explain the absence of a decline in extra-EU inward degree mobile graduates.

352 The number of extra-EU inward graduates increased by 12.8% at doctoral level. On the other hand, the substantial drop in short-cycle tertiary programmes can be attributed to a decline of more than 60% in Spain (-63.2%) and France (-70.7%). The negative trend in France was largely due to increasing lack of information about the origin of mobile graduates, that affected more than 60% of the graduates at this level in 2023. [Monitor Toolbox](#)

353 Mobility can also be concentrated at institutional and regional level, causing mobility patterns to vary a lot within countries. For more on regional and institutional attractiveness in the EU, see a [2017 European Commission \(Joint Research Centre\) report](#).

354 At doctoral level, the share of doctoral graduates originating in Asia increases up to 45.7% and remains at the top. America (23.0%) ranks second at this level, yet the share coming from the United States is only 2.3%. Inward mobile doctoral graduates coming from Africa and non-EU Europe account for 17.0% and 13.8%, respectively. The share for Oceania is only 0.4%. [Monitor Toolbox](#)

Figure 32. **Extra-EU inward mobility originates mainly from Asia and Africa and is highly unbalanced across EU countries**



Source: Eurostat (UOE joint data collection 2023). [Download data](#) [Monitor Toolbox](#)

A more nuanced picture emerges when the number of extra-EU inward mobile graduates is compared with the total number of graduates in a particular country (see Figure 33). Although France and Germany still rank among the most attractive destinations, Luxembourg (189.2), Malta (143.2) and Estonia (107.5) lead in the number of non-EU inward mobile graduates with figures exceeding 100<sup>355</sup> per 1 000

graduates. In contrast, Italy (27.6), Croatia (22.7) and Greece (3.0) have the lowest number of non-EU inward mobile graduates relative to their total graduates. At EU level, the number was 57.1 in 2023, up from 49.8 in 2020. Across the EU, almost all countries saw an increase in these numbers<sup>356</sup>, although the extent of the growth varied<sup>357</sup>.

355 France (92.2) and Germany (75.0).

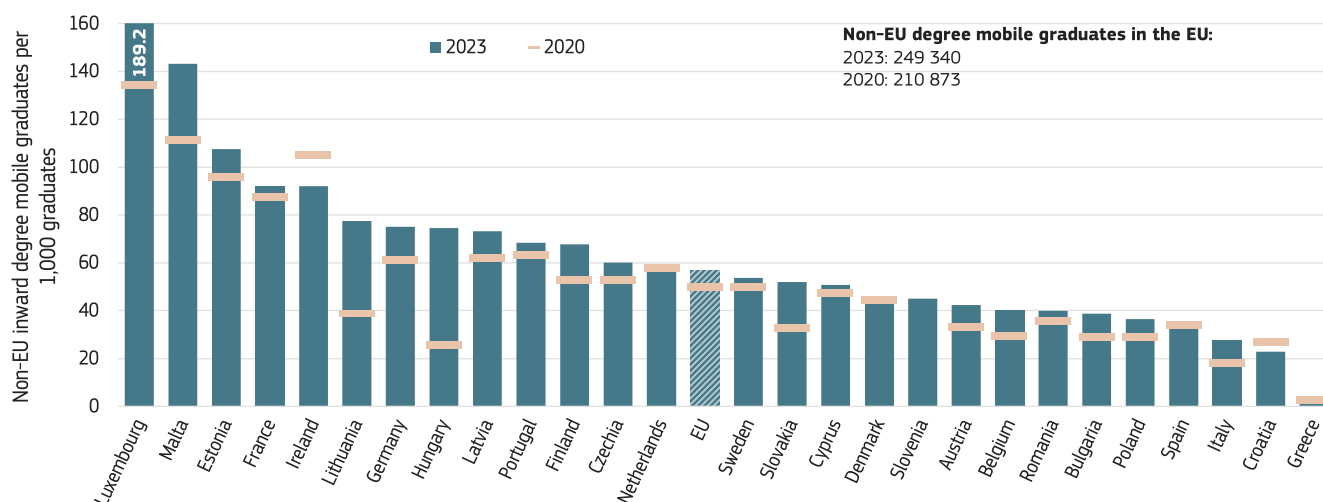
356 Ireland (-13), Croatia (-4.3) and Spain (-0.8) recorded a decrease. [Monitor Toolbox](#)

357 The highest increase was recorded in Luxembourg (54.8), followed by Hungary (48.9) and Slovenia (45.0). In contrast, Romania (4.5), Sweden (4.0), Cyprus (3.4), Denmark (0.5), Greece (0.4), and the Netherlands (0.16) had an increase lower than 5 points.

When examining inward mobile graduates coming from another EU country, Luxembourg still stands out with 352.3<sup>358</sup> EU inward mobile graduates per 1 000 graduates, maintaining its top position. Austria (126.9) and the Netherlands (124.6)

also attract a high number of EU inward-mobile graduates per 1 000 graduates. In contrast, Poland and Croatia report the lowest numbers, each with just 3.1 EU mobile graduates per 1 000 graduates each.

Figure 33. **EU education systems are becoming more attractive to non-EU countries**



Source: Eurostat (UOE joint data collection). [Download data](#) [Monitor Toolbox](#)

Note: Data not available for Slovenia (2020). The countries are listed in descending order based on 2023 data.

A university's reputation and teaching quality<sup>359</sup> are major pull factors for inward mobility. Research orientation, and excellence, and the existence of funding schemes also boost attractiveness, especially at PhD level. Other pull factors include the distance between home and host universities, historical and language ties<sup>360</sup>, cultural proximity, costs of living, labour market access during studies, conditions for students to stay after graduation<sup>361</sup> and the availability of English-language programmes. These pull factors – some of them independent from higher education institutions or even policymakers – can play a significant role for countries that cannot rely on the prestige or the perceived quality of their higher education system to attract students. EU countries have been adopting different strategies to attract more international students. For instance, Germany has eased legal requirements (visas, access conditions) for international students, and access to programmes through increased

recognition of skills and diplomas. Additionally, foreign students are offered language courses, housing support, and counselling. Estonia has adapted its curricula and carries out campaigns to attract more foreign students. Slovakia is increasingly opening its universities to students from abroad. Greece is creating centres to support foreign students in their academic journey and administrative matters. Similarly, in Cyprus, two public universities are now allowed to offer undergraduate programmes in foreign languages (albeit with tuition fees<sup>362</sup>).

<sup>358</sup> Luxembourg is an outlier. Many of these inward mobile graduates are likely to be 'frontier' graduates, who commute to Luxembourg for study purposes. However, commuters are correctly considered degree mobile if they study at tertiary level in a country other than the one where they obtained their upper secondary level certificate. Mobility is defined not by residence, but by participation in the education system abroad.

<sup>359</sup> The role tuition fees play in attracting international graduates is not clear-cut. They can have a negative influence, discouraging student inflow especially from disadvantaged socio-economic backgrounds. But a high level of fees can also be seen a signal of high quality (especially for those institutions and countries with a renowned reputation for education), thereby attracting more students. A reverse causality may also occur, whereby those countries and universities that already attract high numbers of international students can afford to charge high fees based on their popularity. Charging tuition fees allows universities to maintain a constant funding stream, which, in turn, allows them to improve their educational rankings while subsidising the cost of enrolling additional domestic students. At the same time, countries that cannot rely on the prestige of their education system have successfully used the abolition of fees to attract more students.

<sup>360</sup> For example, Spain and Portugal receive a considerable proportion of their extra-EU mobile graduates from the Caribbean, Central America and South America (67.2% for Spain and 57.1% for Portugal). Likewise, 16.7% of the extra-EU mobile graduates in Ireland are from North America. [Monitor Toolbox](#)

<sup>361</sup> Countries implement different policies to retain inward mobile graduates. These include options to change residence permits before graduation, automatic study permit extensions or specific post-graduation permits to search for (and start) a job. For more information, see a [2022 OECD report](#) on international migration.

<sup>362</sup> For more details about national developments, see the 2025 Education and Training Monitor's country reports for [Germany](#), [Estonia](#), [Slovakia](#), [Greece](#), and [Cyprus](#).



Finally, STEM (see [Chapter 1](#)) is the biggest field for EU and non-EU inward degree mobility in tertiary education. On average, inward degree mobile graduates account for about 8.4% of the total number of tertiary graduates in STEM fields<sup>363</sup>. In addition to the higher employment opportunities compared to other fields, STEM fields are more popular among international graduates because these fields are less reliant on language skills (making them attractive to students who may not be fluent in the host country's language), while scientific and technical knowledge are more transferable<sup>364</sup>. However, substantial differences exist by country and by level of education<sup>365</sup>.

### Main takeaway

Only 11.0% of the 4 million tertiary education graduates originating from EU countries are mobile, with 4.4% going abroad for a full degree and around 6.6% for credit mobility. As such, graduate outward mobility remains far from the 23% EU-level target set for 2030. Multiple data limitations persist, however, which may lead to an underestimation of progress towards reaching the target. Meanwhile, the EU has 249,340 inward mobile tertiary graduates coming from non-EU countries, reflecting a growth of 18.2% between 2020 and 2023, and a positive trajectory towards the proposed EU-level 2030 target of 350 000. Growth is recorded at all education levels except for short-cycle programmes and across almost all countries. The highest proportion of inward mobile graduates come from Asia (37.3%), followed by Africa (26.3%), whereas relatively few come from the United States (2.8%).

363 2023 figures. Looking at STEM sub-fields, the share of inward degree mobile graduates is 9.1% of the total number of ICT tertiary graduates, 8.6% in 'natural sciences, mathematics and statistics' and 8.1% in 'engineering, manufacturing and construction'. [Monitor Toolbox](#)

364 In contrast, the lowest share is recorded for the field of education, where less than 2% of total graduates are inward mobile. [Monitor Toolbox](#)

365 For instance, the share of inward mobile graduates in STEM fields ranges from 0.7% in short-cycle programmes to 24.4% at doctoral level. The proportion of inward mobile ICT tertiary graduates out of the total number of graduates ranges from 1.3% in Greece and Spain to 23.0% in Finland, 27.6% in Czechia and 59.7% in Luxembourg. [Monitor Toolbox](#)





## CHAPTER 7. ADULT LEARNING AND SKILLS

Adult learning is essential to keep skills relevant throughout life, and to be able to respond to evolving labour market demands and to support workforce adaptability. To tackle the skills and labour gaps that undermine the EU's competitiveness and prosperity, the European Commission has committed to an overarching skills strategy under the [Union of Skills](#), which reaffirms the need to prioritise adult learning and continuous upskilling throughout life. In addition, more attention is placed on basic skills as a precondition for future skills development. This is reflected in the [Action Plan on Basic Skills](#) which is part of the Commission's overarching Union of Skills strategy. This chapter presents the latest evidence on adult learning, including the development of basic skills.

### 7.1. Adult participation in learning



EU-level 2025 target<sup>366</sup>:  
**'At least 47% of adults aged 25-64 should have participated in learning during the last 12 months by 25'**



EU-level 2030 target<sup>367</sup>:  
**'At least 60% of adults aged 25-64 should have participated in learning during the last 12 months by 2030.'**

More adults need to participate in learning opportunities to ensure that Europe's ageing population can keep up with a fast-changing labour market. That is why EU countries adopted EU-level targets<sup>368</sup> for adult learning participation for 2025 and 2030. While Member States are increasing their focus on lifelong learning<sup>369</sup>, the participation rate stood at only 39.5% in 2022 according to the Adult Education Survey (AES)<sup>370</sup> (Figure 34) with high variability between countries.

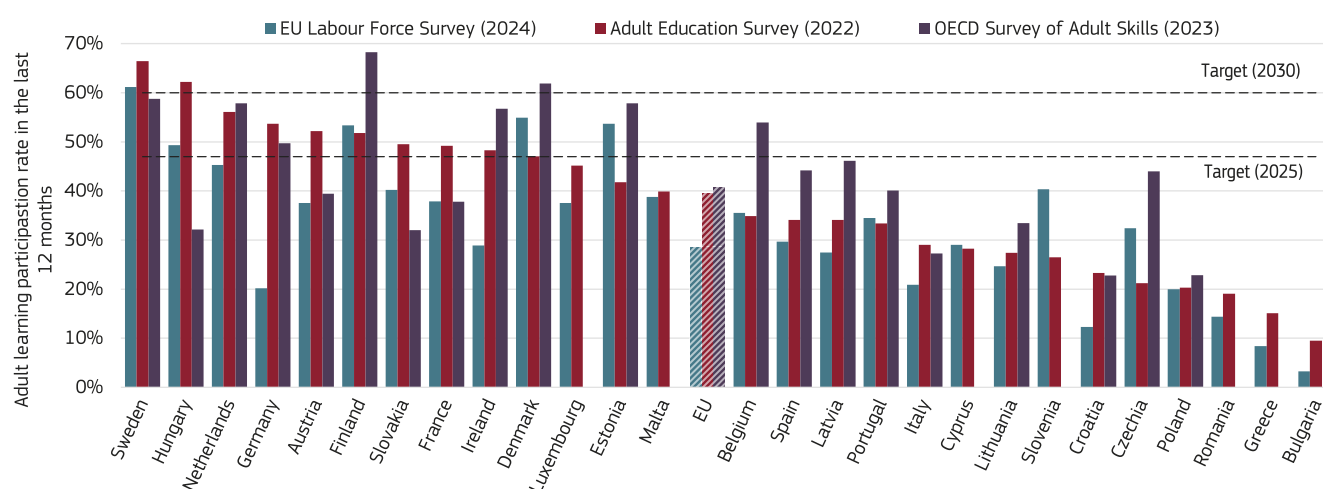
366 Originating in [2021 EFA strategic framework Resolution](#).

367 Originating in the [2021 Council Conclusions on a new European agenda for adult learning 2021-2030](#). See also the [European Pillar of Social Rights Action Plan](#).

368 The European Pillar of Social Rights Action Plan raised the ambition for adult learning by increasing the target from 47% to 60% by 2030. The 2021 Council Conclusions on a new European agenda for adult learning 2021-2030 refers to both targets for monitoring participation in adult learning. As outlined in the [2023 Education and Training Monitor](#), the European Commission views the 2025 EU-level target on adult learning as a milestone towards achieving the 2030 EU-level target.

369 For an overview of policy developments in reskilling, upskilling, CVET and lifelong learning see [Cedefop & ETF \(2025\). Towards EU priorities: 2021-25 progress: insights from monitoring and analysis](#).

370 All data from the Adult Education Survey mentioned here exclude guided on-the-job training. For further details on the monitoring of the EU-level targets, see Box 16 in the 2024 Education and Training Monitor's [comparative report \(Chapter 6\)](#).

Figure 34. **Adult learning participation varies significantly across countries and data sources**

Source: Eurostat (EU Labour Force Survey 2024, Adult Education Survey 2022), OECD (Survey of Adult Skills 2023). [Download data](#) [Monitor Toolbox](#)

Note: Results from Adult Education Survey (AES) exclude guided on-the-job training; the OECD Survey of Adult Skills covers participation in job-related learning, including all forms of formal and non-formal learning; the EU average is a weighted average of participating countries and regions (for Belgium, only the Flemish region). AES 2022 was conducted between 2022 and March 2023. Breaks in time series and reliability flags available at the downloadable Excel file. Countries are listed in descending order based on AES (2022) data.

While the target for participation in adult learning is based on the Adult Education Survey (AES)<sup>371</sup>, additional insights into adults' involvement in learning activities can be gained from other surveys, such as the biennial EU Labour Force Survey (EU-LFS) and the OECD's Survey of Adult Skills (PIAAC)<sup>372</sup>. According to EU-LFS, adult participation in learning stood at 28.5% in 2024, up from 25.1% in 2022. These significantly lower participation rates recorded in the EU-LFS have possibly been underestimated due to methodological limitations<sup>373</sup>. In 2024, participation rates increased in almost all countries<sup>374</sup>, ranging from Malta (4.3 percentage points) to Hungary (26.2)<sup>375</sup>, which bodes well for adult learning participation rates. In addition, PIAAC 2023<sup>376</sup> recorded a 40.8% average participation in formal and non-formal learning across the 20 participating EU countries<sup>377</sup>, which is similar to the levels of the 2022 AES<sup>378</sup>.

371 Although the 2021 EEA strategic framework resolution set a target on adult learning based on the EU-LFS, subsequent work in recent years has shown that the Adult Education Survey provides a more reliable basis for monitoring participation in adult learning over the previous 12 months. In 2024, the Employment Committee Indicators Group (EMCO IG) endorsed using the AES (excluding guided on-the-job-training) for monitoring adult participation in learning in the context of the EU-level and national adult learning targets, and as part of the social scoreboard and Joint Employment Report. A transition to EU-LFS data will be reconsidered taking into account changes that some EU countries are implementing for the next EU-LFS wave, as well as a further assessment of differences between AES and EU-LFS data.

372 Note that while all three surveys aim to monitor participation in adult learning, their results are different due to methodological differences, that affect comparability. Reported participation rates and trends can vary considerably for individual countries.

373 The reasons for these differences include the surveys' purpose, coverage of non-formal education and training, number of variables for non-formal education and training (the variables are more detailed in the AES than in the EU-LFS), how national questionnaires are conducted, the use of proxies (responses from, for instance, another household member), and interviewer training. Most of these factors may lead to a loss of information and a downward bias in the EU-LFS indicator. For more information on the differences in the indicator for adult learning participation among EU-LFS and AES see Box 16 in the 2024 Education and Training Monitor's [comparative report \(Chapter 6\)](#).

374 Except for Italy, Malta, Slovakia and the Netherlands.

375 While Hungary saw a major change in survey implementation, substantial increases are also observed in countries with no implementation changes.

376 The survey is conducted as part of the OECD's Programme for the International Assessment of Adult Competences (PIAAC) which is conducted in ten-year cycles, and assesses literacy, numeracy and problem-solving skills among adults aged 16 to 65. See the accompanying [2024 OECD report](#).

377 These are Austria, the Flemish region of Belgium, Croatia, Czechia, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, the Netherlands, Poland, Portugal, Slovakia, Spain and Sweden.

378 For more details about the methodological differences see [OECD \(2025\) Trends in Adult Learning](#).

## Box 14. Union of Skills – upcoming reskilling and upskilling actions

The green, digital, and demographic transitions require urgent and coordinated efforts to equip people with the skills they need to adapt and thrive, while ensuring that no one is left behind. The [European Skills Agenda](#) (2020) sets out a comprehensive strategy to help individuals and businesses to develop the skills needed for the green and digital transitions, while promoting competitiveness, social fairness and resilience.

The [Union of Skills](#) second strand, 'Upskill and reskill to ensure future-oriented skills', focuses on strengthening adult learning participation and addressing skills shortages and gaps, including in strategic sectors such as construction, healthcare, care, and advanced digital technologies. It recognises that while a skill may be in shortage in one country or region, it may be in oversupply in another and highlights the importance of timely and accessible skills intelligence to inform individual and organisational choices. Furthermore, advancing upskilling and reskilling efforts requires a shared responsibility of public authorities, businesses, social partners, education and training providers, and individuals.

This strand provides for several key deliverables: continued support for the rollout and consolidation of Individual Learning Accounts – a personal budget for training for all adults; the expansion of micro-credentials as flexible, quality-assured learning solutions; the promotion of innovative community learning spaces to better reach and motivate low-skilled adults; and improved cooperation with public employment services and social services to motivate adults and improve their basic skills. New initiatives include: the piloting of a Skills Guarantee for workers, which helps workers change from career transitions in declining sectors to careers in growing ones (2025); the roll-out of EU Skills Academies targeting strategic sectors following a comprehensive review (2026); and, the launch of transnational university-business partnerships to train people in sectors experiencing acute skills gaps (2026). Public-private cooperation will be further strengthened through instruments such as the Pact for Skills, which brings together public and private stakeholders to support upskilling and reskilling in key sectors.

Participation in adult learning varies greatly across population groups. Despite considerable differences in overall participation levels between EU-LFS, AES and PIAAC, the patterns of participation based on population characteristics are consistent across the three surveys. Younger adults are more likely to participate in education and training than older individuals. Similarly, employed adults participate in learning far more frequently than those who are unemployed or outside the labour force. Educational attainment also influences participation rates, with highly educated adults significantly more likely to engage in learning than those with lower levels of education.

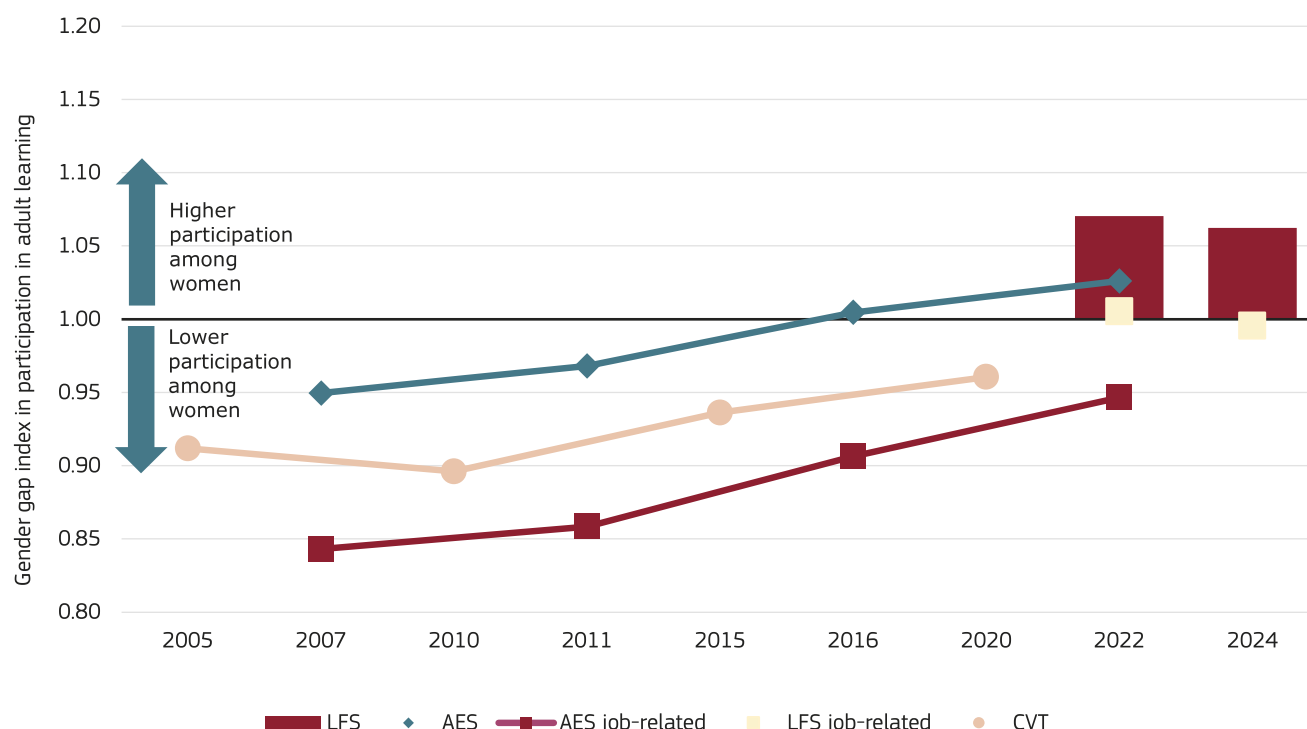
While characteristics such as age, employment status, and educational attainment strongly affect the likelihood of taking part in learning, on the surface, gender has a more limited impact, with women participating only slightly more than men. However, a more detailed look at the data, reveals significant differences in barriers to and drivers for

participation in adult learning by sex, which indicates pointing to the need for differentiated policy responses.

While women have participated more in learning in recent years, this has not always been the case. Figure 35 shows the gender gap between women and men between 2005 and 2024. It covers: (i) participation in education and training overall; (ii) participation in job-related non-formal learning; and (iii) participation in continuing vocational training (CVT) courses. According to the AES, women recorded lower overall participation rates than men from 2007 to 2015, and caught up with men only in 2016. There was an even larger gender gap in job-related and CVT courses. While this gap has also narrowed over time, the female participation rate in job-related and CVT courses remains below or similar to that of men. This is particularly true for participation in job-related learning sponsored by the employer, which is the largest share of job-related training<sup>379</sup>.

379 Based on the Adult Education Survey (2022), the participation rate in job-related non-formal education and training was 33.7% for employer-sponsored training and 4.4% for training not sponsored by the employer.

**Figure 35. While women participate more in learning overall, they have been under-represented in job-related learning**



Source: Eurostat (EU Labour Force Survey, Adult Education Survey, Continuing Vocational Training Survey). [Download data](#) [Monitor Toolbox](#)

Note: The gender gap index corresponds to the ratio of participation rates between women and men.

Women are more likely to report personal barriers to participating in adult learning. In 2022, 8.9% of women cited such barriers, compared with 4.8% of men<sup>380</sup>. Among women, the most frequently reported obstacles were schedule (37.2%), followed by costs (31.6%) and family reasons (31.5%)<sup>381</sup>. Men also most commonly cited schedule (42.4%) and costs (25.2%) but were more likely than women to mention a lack of support from the employer (20.7%). While the proportion of women citing family reasons has declined from 45.4% in 2007, it remains considerably higher than among men. The largest gender gaps are for family reasons (12.0 percentage points) and costs (6.4), which are both more commonly cited by women. When asked to identify the main barrier to participation, among those mentioned previously, both men and women report schedule (26.9% and 19.3% respectively). For women, however, family reasons followed closely at 18.7%, compared with just 9.3% for men<sup>382</sup>.

Limited formal childcare support and challenges to maintaining work-life balance can lead women to avoid careers that require frequent skills development<sup>383</sup>. The lower overall employment rate of women and the higher uptake of part-time work<sup>384</sup> can lead to fewer instances of job-related learning. Aside from reinforcing gender employment gaps and gender pay gaps by concentrating women and men in different sectors and occupations, the lower participation in job-related learning negatively affects women's reintegration into the labour market following a career break due to childcare responsibilities.

380 [Monitor Toolbox](#)

381 [Monitor Toolbox](#)

382 [Monitor Toolbox](#)

383 [European Commission \(2025\) 2025 report on gender equality in the EU](#)

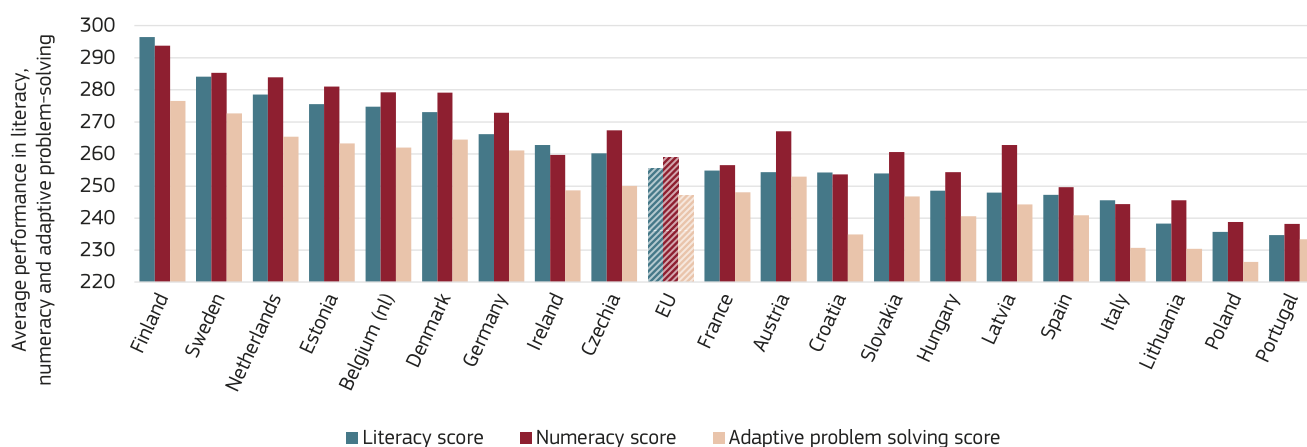
384 In 2024, women's employment rate was 70.8% (compared with 80.8% for men) and the share of women in part-time work was 27.8% (compared with 7.7% for men).

## 7.2. Adult basic skills

The OECD's 2023 Survey of Adult Skills shows that literacy, numeracy and problem-solving skills are interconnected (Figure 36). These skills are not isolated but rather influence each other, forming a foundation for personal and professional success. Despite efforts to strengthen adult learning over the past decade, literacy skills declined across the 17

EU countries participating in both cycles of the survey<sup>385</sup>, with statistically significant drops in Hungary, Lithuania, Poland, Slovakia, Austria, Czechia, and France. Significant improvements in literacy were observed only in Finland and Denmark. Numeracy remained comparatively stable, with significant declines observed only in Poland, Lithuania, Slovakia and Hungary. Only Finland, Estonia, Denmark and the Netherlands made significant progress in numeracy.

**Figure 36. Average performance in literacy, numeracy and adaptive problem-solving varies greatly across countries**



Source: OECD (Survey of Adult Skills 2023). [Download data](#) [Monitor Toolbox](#)

Note: Most countries besides Lithuania (2015) and Hungary (2017) took part in the first cycle in 2012. Poland's results should be interpreted with caution due to the high share of respondents with unusual response patterns. Countries are shown in descending order based on their literacy score.

Around one in five adults (21.8%) in the EU underachieve<sup>386</sup> in both literacy and numeracy (Figure 37)<sup>387</sup>. There are substantial differences across EU countries with one in three adults underachieving in Portugal (34.1%) and only one in ten in Sweden (8.8%). Adults with low proficiency in one domain are also likely to have low proficiency in other domains because the three domains are highly correlated<sup>388</sup>. Moreover, over the last decade no EU country recorded a significant decrease in underachievement in literacy<sup>389</sup> and only Finland reported a significant decrease in numeracy underachievement (-3.8 percentage points)<sup>390</sup>.

<sup>385</sup> For problem-solving, the results from the two cycles are not comparable due to differences in the underlying constructs. The 2012-cycle included problem-solving in technology-rich environments, while the 2023 cycle included adaptive problem-solving.

<sup>386</sup> Underachievement is defined as a score at the two lowest proficiency levels (at or below Level 1), meaning that adults are at most able to process simple short texts and to perform simple arithmetic calculations.

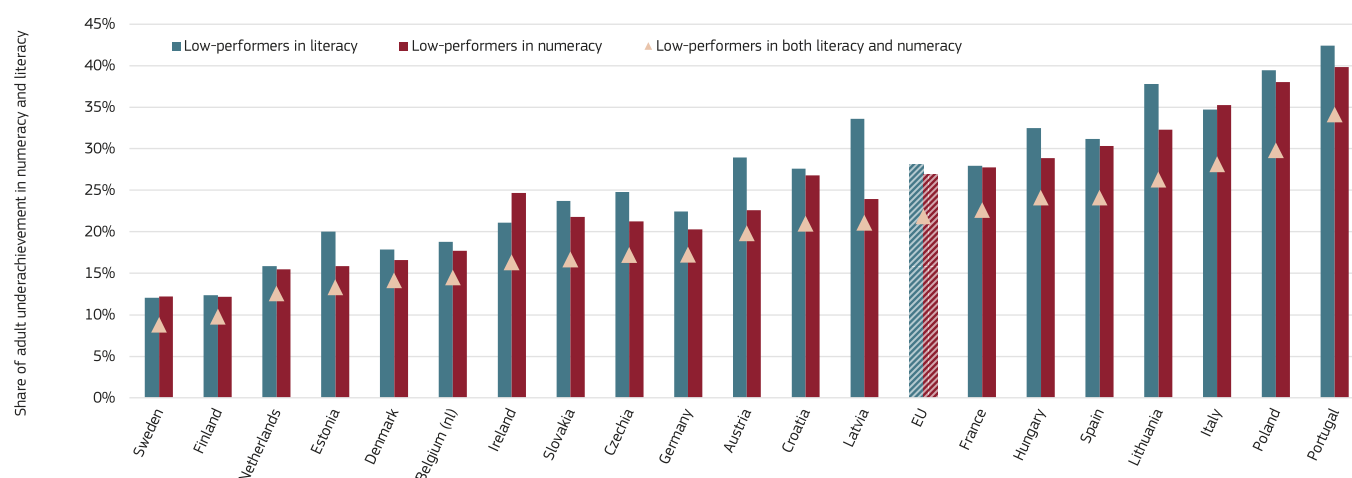
<sup>387</sup> The survey also shows that skills inequalities between the lowest- and best-performing adults have widened within countries, especially in literacy. This is because most of the countries observed larger declines among the lowest performing adults. In Estonia, Germany and the Flemish community of Belgium, the 10<sup>th</sup> percentile showed a significant decline in literacy skills, while the 90<sup>th</sup> recorded a significant increase. For numeracy, the same pattern was observed for Czechia.

<sup>388</sup> For more information, see the [2016 OECD publication](#) on further results from the Survey of adult skills.

<sup>389</sup> Underachievement in literacy increased by more than 20 percentage points in two EU countries (Lithuania and Poland), between 10 and 20 percentage points in three countries (Hungary, Slovakia, Austria), and between 5 and 10 percentage points in another four (Czechia, Italy, Estonia, France).

<sup>390</sup> Underachievement in numeracy decreased by more than 10 percentage points in three EU countries (Poland, Lithuania, and Hungary), while three countries (Slovakia, Austria, and Czechia) experienced increases of below 10 percentage points.



Figure 37. **Around one in five adults has low proficiency in numeracy and literacy**

Source: OECD (Survey of Adult Skills 2023). [Download data](#) [Monitor Toolbox](#)

Note: Countries are shown in ascending order by the low performers in both literacy and numeracy.

The [Union of Skills](#) focuses also on digital skills<sup>391</sup>, reconfirming not only the 2030 EU-level target on computer and information literacy among eighth graders ([Section 2.2](#)), but also [Europe's Digital Decade](#) target of at least 80% of adults having basic digital skills by 2030<sup>392</sup>. In 2023, only 56% of people aged 16 to 74 in the EU possessed at least basic digital skills<sup>393</sup>. Figure 38 shows the association between the share of adults with at least basic digital skills and those with at least basic literacy skills<sup>394</sup>. The correlation is moderately positive (a correlation coefficient of 0.71)<sup>395</sup>, suggesting that countries with higher shares of adults with at least basic proficiency in literacy are likely to perform better in basic digital skills too.

391 Alongside literacy, mathematics, science and citizenship skills.

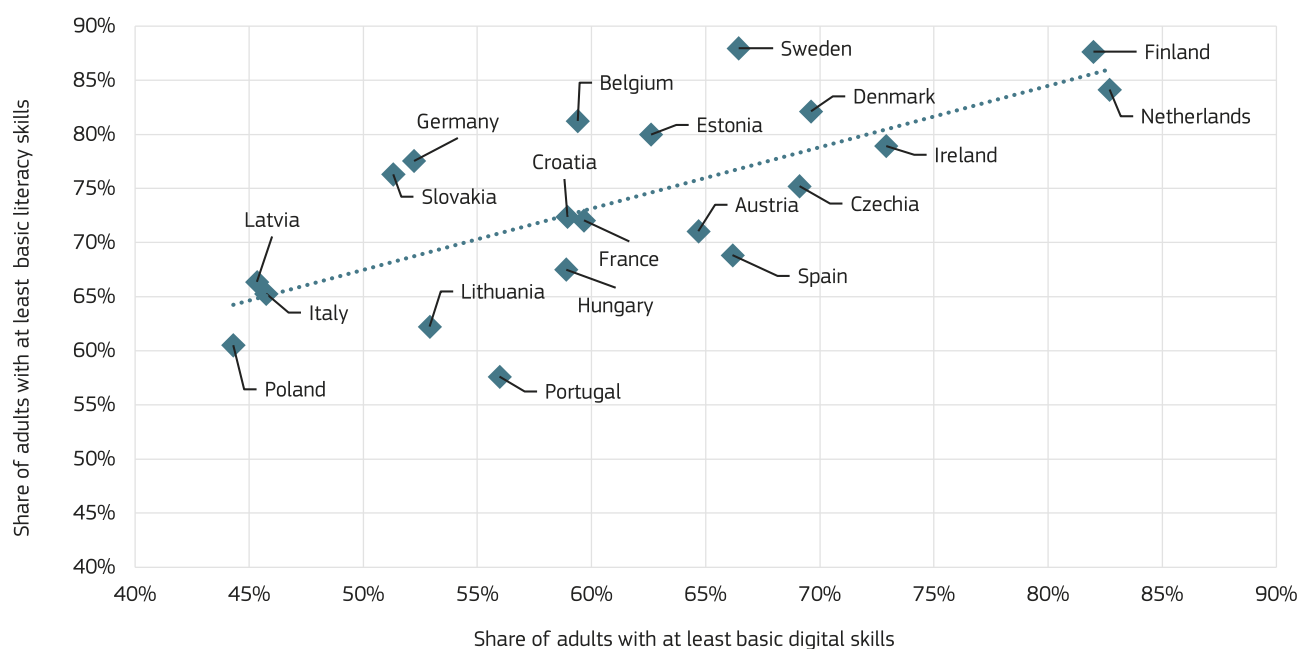
392 For the adult population, no direct measure of computer and information literacy is available, such as the data for eighth grade students used in [Section 2.2](#). Instead, this 2030 EU-level target relies on the Digital Skills Indicator 2.0, which is a composite indicator based on self-reported activities related to internet or software usage in five specific areas: (i) information and data literacy; (ii) communication and collaboration; (iii) digital content creation; (iv) safety; and (v) problem solving. It is assumed that individuals who have performed certain activities have the corresponding skills. Therefore, the indicators can be considered a proxy for individuals' digital skills.

393 For more information, see the [State of the Digital Decade 2025 report](#).

394 Basic proficiency in literacy (and numeracy) is defined as the share of adults scoring at level 2 or above in the OECD's 2023 Survey of Adult Skills. In other words, it is the inverted underachievement rate used above.

395 The correlation coefficient between digital skills and numeracy is 0.63.

Figure 38. **At least basic literacy skills and at least basic digital skills tend to go hand in hand among adults**



Source: Eurostat (Digital Skills Indicator 2.0 - 2023), OECD (Survey of Adult Skills 2023). [Download data](#) [Monitor Toolbox](#)

Note: The share of population with basic or above literacy skills in Belgium corresponds to the Flemish region.

Reskilling and upskilling initiatives, such as individual learning accounts can help people access training opportunities and increase their motivation to participate. While these initiatives focus on the whole working-age population, additional support can be provided for those most in need such as individuals with low basic skills. Moreover, vulnerable groups such as persons with disabilities or with migrant background can be targeted with specific actions to harness their 'untapped potential' in the labour market, as acknowledged in the [Union of Skills](#).

### Main takeaway

The participation of adults in formal and non-formal learning reached 39.5% in 2022. While other data sources indicate increases in recent years, achieving the EU-level target of 60% by 2030 will require a renewed momentum. The various data sources tracking adult learning in the last 12 months reveal consistent patterns across age, educational attainment, and employment status. Gender appears to have limited influence on overall participation rates. However, a closer look at job-related learning reveals higher rates among men, although that gap has narrowed. Basic skills form the foundation of lifelong learning. Yet, over the past decade, adult literacy proficiency has declined, numeracy skills have largely stagnated, and skill inequalities have widened. Around one in five adults (21.8%) now lacks basic proficiency in both literacy and numeracy – a substantial figure that has increased in most EU countries. Furthermore, in 2023, only 56% of people aged 16 to 74 in the EU possessed at least basic digital skills.



## CONCLUSION

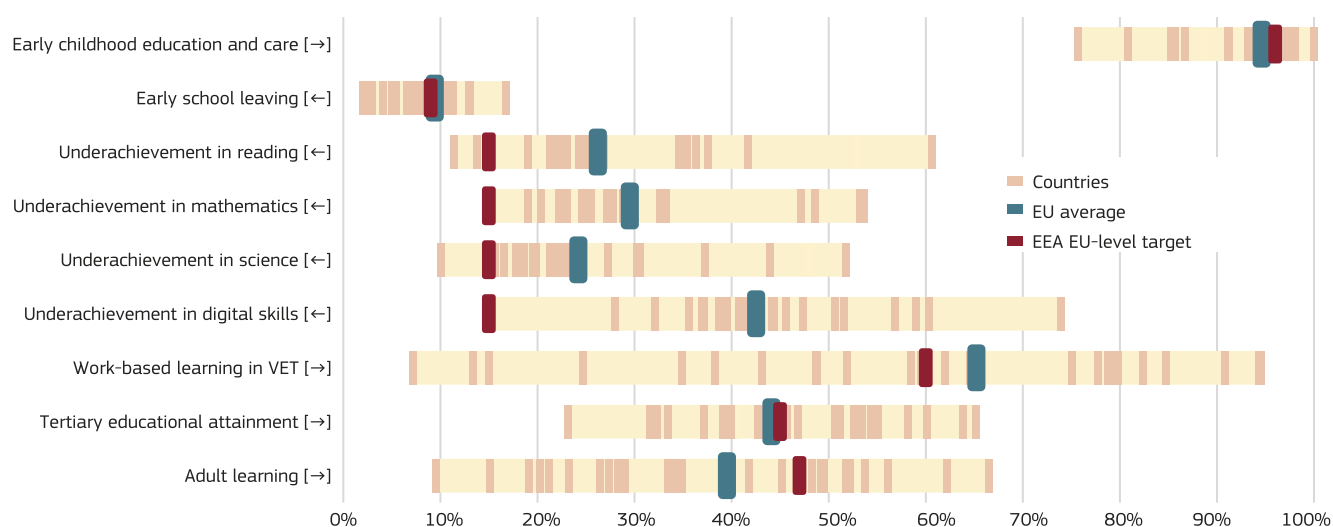
The 2025 Education and Training Monitor's comparative report tracks the progress towards reaching EU-level targets, most notably the ones adopted under the [2021 EEA strategic framework Resolution](#).

This year's edition of the report also presents key values, trends, and country differences for the targets proposed

by the European Commission in the [2025 Union of Skills Communication](#) and suggested in the [interim evaluation of the 2021-2030 European Education Area Strategic Framework](#)<sup>396</sup>.

While progress is being made on achieving the EU-level targets, the report highlights substantial variability between EU education systems as illustrated by Figure 39.

**Figure 39. Work-based learning in VET records the highest variability**



Source: Eurostat (EU Labour Force Survey 2024, UOE joint data collection 2023, and Adult Education Survey 2022), OECD (PISA 2022), IEA (ICILS 2023). [Download data](#) [Monitor Toolbox](#)

Note: Data are not available for early childhood education and care in Greece, work-based learning in VET in Bulgaria, Cyprus, Latvia and Luxembourg and for the non-participating countries in PISA and ICILS. The Netherlands and Romania are not included in the EU average in digital skills due to not meeting the technical standards. Metadata and flags available in the original source.

396 See the [Annex](#) for a detailed overview of the targets, as presented in the [interim evaluation of the 2021-2030 European Education Area Strategic Framework](#).

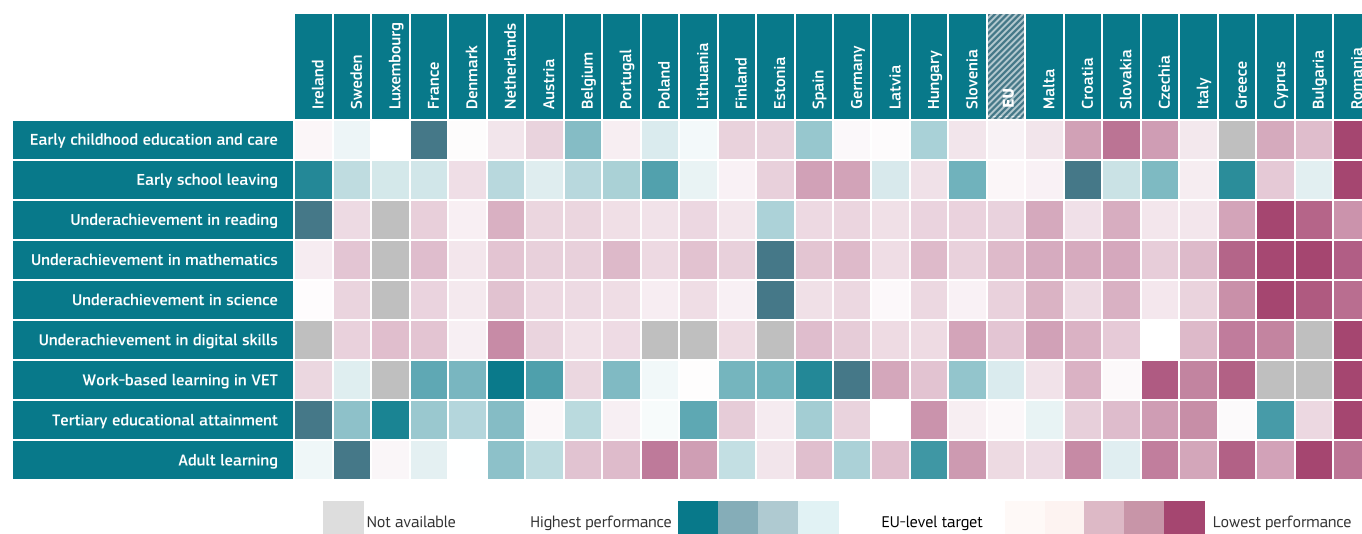
Looking more closely at the improvements made, the proportion of children between the age of 3 and the start of compulsory primary education enrolled in early childhood education and care increased significantly between 2022 and 2023, inching closer to the 2030 EU-level target of at least 96% with a rate of 94.6%. Ensuring high-quality provision remains essential for participation to have a positive impact. Early school leaving is also on track to meet the 2030 EU-level target of less than 9% with the 2024 rate being 9.4%. Further decreases in the rate can be achieved through sustained, cross-sectoral and multi-targeted strategies, focused on teacher preparation, inclusive schooling, and support to specific groups at risk of drop-out.

The areas of VET and higher education report successes as well. Exposure to work-based learning in VET (65.2% in 2024) exceeds the 2025 EU-level target of at least 60%, although a high variability across countries has been recorded. The tertiary educational attainment rate among 25–34-year-olds stands at 44.1%, nearing the 2030 EU-level target of

at least 45%. Broadening participation and addressing the needs of a more varied student population will help achieve higher tertiary attainment rates.

However, some EU-level targets are highly unlikely to be reached without a renewed momentum. The situation is particularly worrying for underachievement in basic skills (Figure 40). Record-high underachievement rates in reading (26.2%), mathematics (29.5%), and science (24.2%), as well as in digital skills (42.5%), are far above the 2030 EU-level target of rates below 15%. Turning around these negative trends requires tackling drivers such as digital distractions, teacher shortages, waning parental involvement, and enhancing teacher capacity and access to digital infrastructure. Additionally, with a rate of only 39.5%, adult learning participation is significantly below the 47% EU-level target for 2025<sup>397</sup>. Adult learning will have to increase across the board, but particularly among key target groups most in need of reskilling and upskilling – for whom adult learning rates remain far below average.

Figure 40. **Significant improvements in basic skills and adult learning are needed**



Source: Eurostat (EU Labour Force Survey 2024, UOE joint data collection 2023, and Adult Education Survey 2022), OECD (PISA 2022) and IEA (ICILS 2023). [Download data](#) [Monitor Toolbox](#)

Note: Countries are displayed according to the overall average score across the EEA EU-level targets. Data are not available for Bulgaria (underachievement in digital skills, work-based learning in VET), Estonia and Ireland (underachievement in digital skills), Greece (early childhood education and care), Cyprus (work-based learning in VET), Lithuania (underachievement in digital skills), Luxembourg (underachievement in reading, mathematics, and science, and work-based learning in VET) and Poland (underachievement in digital skills).

397 It is even further from the more ambitious target of 60% by 2030.

The Monitor also shows that there is scope to increase STEM enrolment in particular by encouraging female enrolment. Higher enrolment figures would ensure a stronger STEM supply in the coming years, capable of supporting the ambition of strengthening EU's competitiveness, resilience and prosperity.

Equity in schools is a critical issue for EU education systems requiring cross-sectoral actions that address school segregation in combination with remedial policies, as this is a problem deeply rooted in broader societal inequalities. Enhancing teacher capacity can help all students succeed, but also increase the share of top performers in basic skills and of students with an adequate level of civic knowledge. On a more positive note, the report shows an encouraging trend regarding inward mobile tertiary graduates from outside the EU. Further improvements can be achieved by enhancing research and teaching quality and funding schemes and providing conditions for staying after graduation.

However, although some progress has been made towards achieving certain targets, this brief summary masks substantial variations within EU education systems as well as pronounced disparities by sex, degree of urbanisation, country of birth, disability, and socio-economic background. Combined with the worrying outcomes in basic skills, these differences call for more research to address knowledge gaps, more targeted measures and stronger policy focus to enhance effectiveness and ensure continued progress.

The European Commission supports EU countries in their efforts to improve the performance of their education systems as education and training are key enablers for the EU's competitiveness, preparedness and long-term resilience, as highlighted by the Union of Skills.

In terms of policy cooperation, the interim evaluation of the EEA has concluded that European cooperation under the EEA has helped to increase the ownership and understanding of common priorities in education and training across EEA actors and stakeholders in the wider education and training community. Based on the findings of the interim evaluation, the European Commission put forward a proposal on the development of the EEA. This was prepared in view of the Council's review of the strategic framework for European cooperation towards the EEA and beyond, ahead of the EEA's second cycle (2026-2030).

To provide knowledge and resources to identify how to make EU education systems more effective, efficient and equitable, the European Commission launched the Learning Lab on Investing in Quality Education and Training in 2022. The Learning Lab proposes training courses on education policy evaluation methodologies to policymakers at all levels (national, regional, and local) and education practitioners; collaborative work among Member States; and, evaluation of education policies. The Learning Lab also conducts its own policy-oriented research on education policies to further expand the evidence available to support EU and national policy making.

In addition, the EU provides funding for research in education under Horizon Europe, the EU research and innovation programme. In 2023-24, Horizon Europe allocated funding to conduct innovative research in three under-explored areas of education policy: efficiency and effectiveness of investment, mapping of longitudinal data and assessment of inequalities, and education and labour market transitions of young people. Several research projects are already under way. In 2025, Horizon Europe funding is focussing on two educational research areas: evaluation and use of evidence in policy and practice, and impact of the learning environment and digital tools.

EU funds for education and training have tripled in the 2021-27 funding period, with a total allocation exceeding EUR 100 billion. In particular, the Recovery and Resilience Facility (RRF) provides unprecedented opportunities to EU countries to implement major reforms and investments in education and training. Overall, EUR 75 billion<sup>398</sup> are allocated in the RRF to address key challenges faced by education and training systems and the EU's Technical Support Instrument has accompanied national reforms in these areas through more than 460 projects. In addition, Member States and regions have allocated EUR 42 billion under the European Social Fund Plus (ESF+) and EUR 8.9 billion under the European Regional Development Fund. The European Commission's [proposal for the next Multiannual Financial Framework](#) (2028-2034) maintains high ambitions for education, by proposing EUR 40 billion, nearly the double value of the 2021-2027 period, for Erasmus+. Moreover, at least 14% of National and Regional Partnership Plans would be dedicated to social expenditure, including for education and training. Boosting investment in education and training pays off by enhancing human capital, increasing productivity, resilience and preparedness. Moreover, education and training are central to addressing Europe's demographic transition, including the challenge of skills shortages. This makes education and training not just a social good, but a strategic economic asset.

398 Estimated expenditure based on the pillar tagging methodology, corresponding to measures contained in national recovery and resilience plans which are allocated to the following policy areas (either as primary or secondary assignment): adult learning; early childhood education; general, vocational, and higher education; green skills and jobs; and, human capital and digitalisation. For more information, see the [Recovery and Resilience Scoreboard](#).



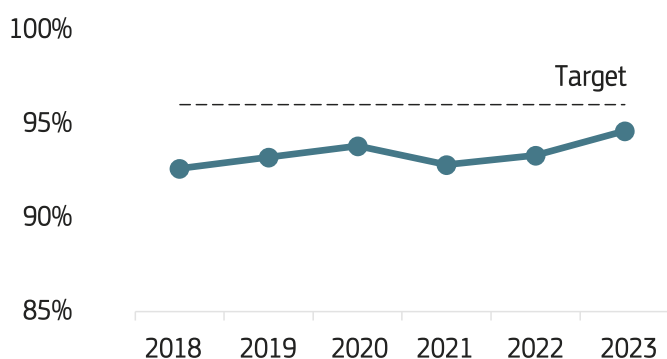


## ANNEX

|   |                                                                                                                                                                                                                                                     |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| * | Target proposed in the <a href="#">Union of Skills Communication</a>                                                                                                                                                                                |
| ◊ | EU-level target originated in the <a href="#">2021 Council Resolution</a> on a strategic framework for European cooperation in education and training towards the European Education Area (EEA) and reaffirmed in the Union of Skills Communication |
| † | Target suggested in the <a href="#">interim evaluation of the 2021-2030 European Education Area Strategic Framework</a>                                                                                                                             |
| ‡ | Existing EEA target that could be reaffirmed in EEA 2026-2030                                                                                                                                                                                       |
| ● | Target originated in the <a href="#">2021 Council Conclusions on a new European agenda for adult learning 2021-2030</a>                                                                                                                             |

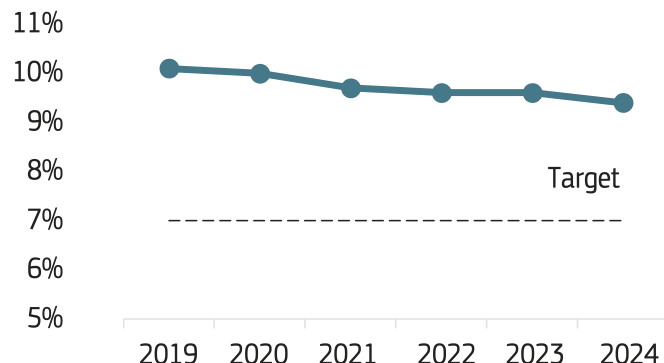
### Sectoral targets<sup>399</sup>

#### Early childhood education and care **94.6% (2023)**



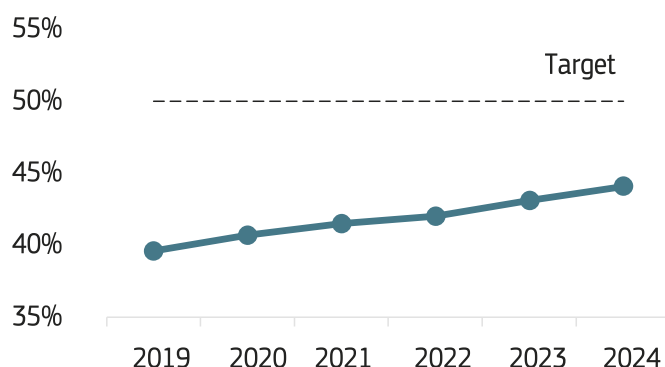
By 2030, at least 96% of children between 3 years old and the starting age for compulsory primary education should participate in early childhood education and care. The latest figure is 94.6%. ‡

#### Early school leaving **9.4% (2024)**

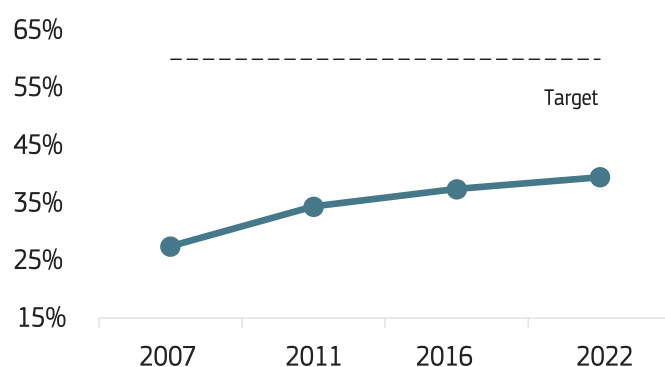


By 2030, the share of early leavers from education and training should be less than 7%, stepping up the ambition from the original of 9% target, set in the [2021 EEA strategic framework Resolution](#). The latest figure is 9.4%. ‡

399 A decision will be taken on proposals for targets in the field of vocational education and training (VET) will be taken as part of the forthcoming European VET strategy. Existing EU-level targets concern work-based learning (for 2025), employability (for 2025) and learning mobility (for 2030, as part of 'Europe on the Move'). See [Chapter 5](#) of this report.

**Tertiary educational attainment****44.1% (2024)**

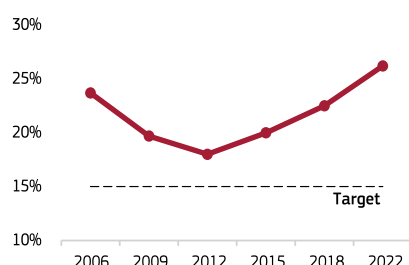
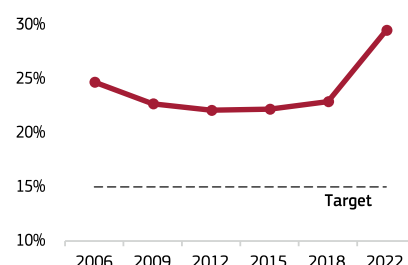
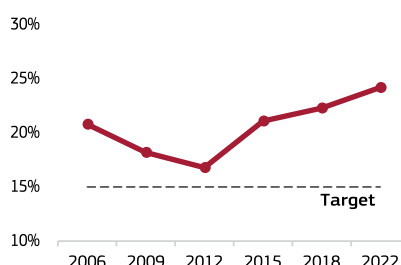
By 2030, the share of 25-34-year-olds with tertiary educational attainment should be at least 50%, stepping up the ambition from the original target of 45%, set in the [2021 EEA strategic framework Resolution](#). The latest figure is 44.2%. ‡

**Adult learning****39.5% (2022)**

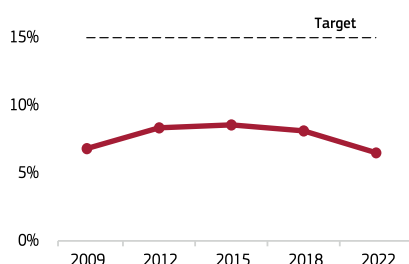
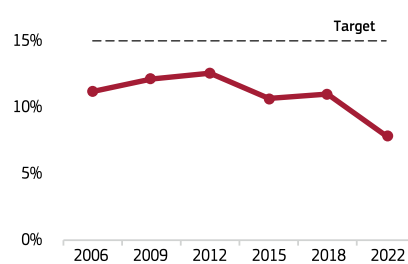
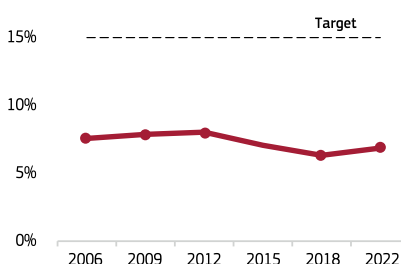
By 2030, at least 60% of adults should have participated in learning during the last 12 months. The latest figure is 39.5%.

**Thematic targets****Basic skills**

By 2030, the share of underachievement in reading, mathematics and science should be less than 15%. The latest figures are 26.2%, 29.5% and 24.2% respectively. ♦

**Underachievement in reading****26.2% (2022)****Underachievement in mathematics****29.5% (2022)****Underachievement in science****24.2% (2022)**

The share of top performance in reading, mathematics and science should be at least 15% by 2030. The latest figures are 6.5%, 7.9% and 6.9% respectively. \*

**Top performance in reading****6.5% (2022)****Top performance in mathematics****7.9% (2022)****Top performance in science****6.9% (2022)**

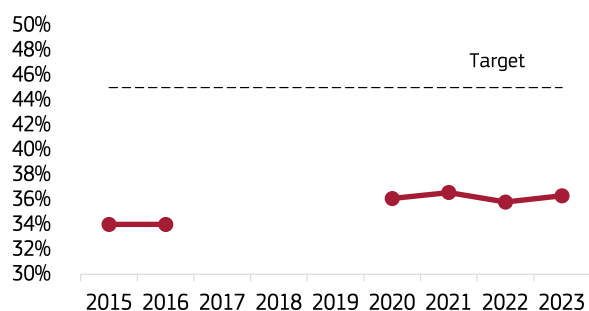
By 2030, the share of **underachievement in computer and information literacy** should be less than 15%. The latest figure is 42.5% (no comparable trend is available). ♦ **42.5% (2023)**

By 2030, the share of **adequate performance in civic knowledge** should be at least 85%. The latest figure is 63.2% (no comparable trend is available). † **63.2% (2022)**

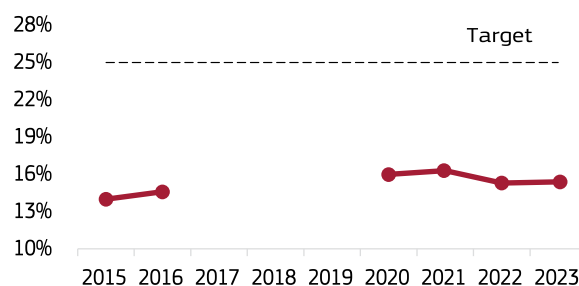
## STEM

By 2030, the [share of students enrolled in STEM fields at initial medium-level VET](#) should be at least 45%, with at least 1 out of every 4 students female. The latest STEM enrolment rate is 36.3%, with 15.4% women (out of the total). \*

Total: **36.3%** (2023)

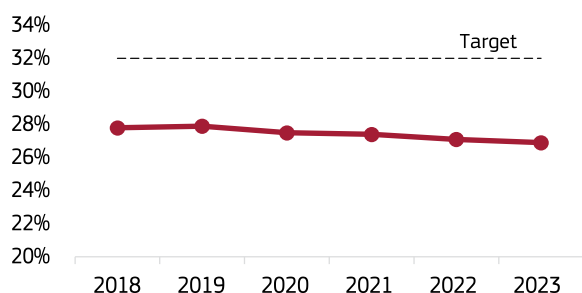


Women (out of total): **15.4%** (2023)

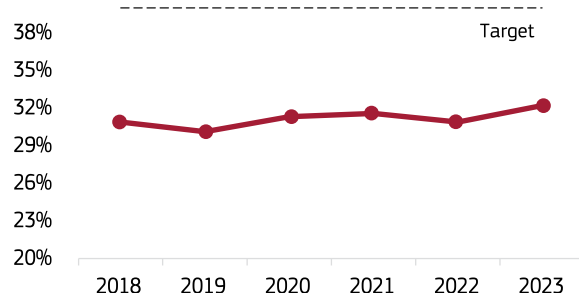


By 2030, the [share of students enrolled in STEM fields at tertiary level](#) should be at least 32%, with at least 2 out of every 5 students female. The latest STEM enrolment share is 26.9%, with 32.2% women (out of the total). \*

Total: **26.9%** (2023)

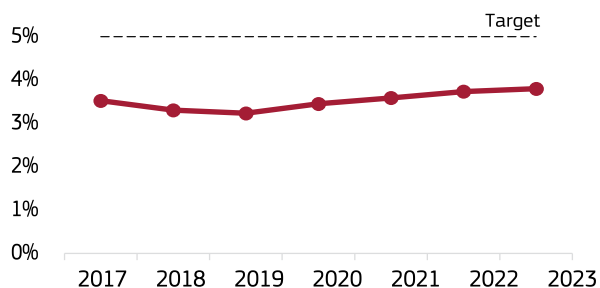


Women (out of total): **32.2%** (2023)

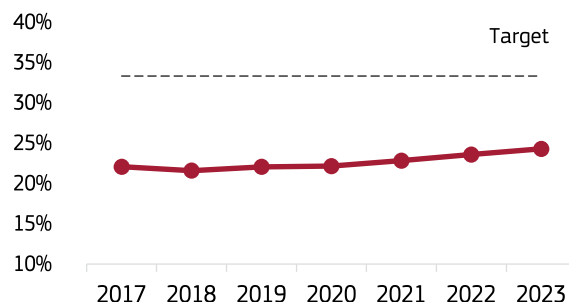


By 2030, the [share of students enrolled in ICT PhD programmes](#) should be at least 5%, with at least one out of every three students female. The latest ICT enrolment share is 3.8%, with 24.3% women (out of the total). \*

Total: **3.8%** (2023)

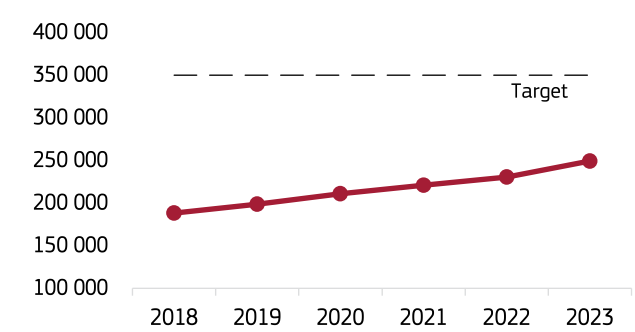


Women (out of total): **24.3%** (2023)



International attractiveness

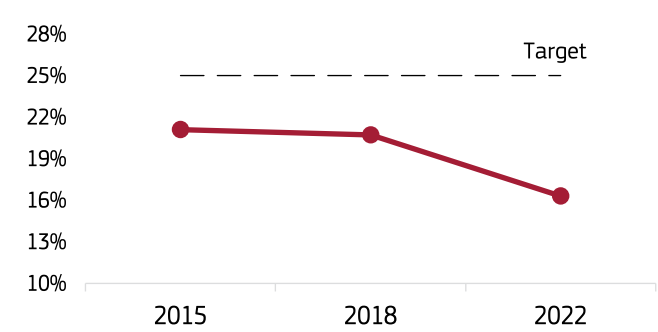
249 340 (2023)



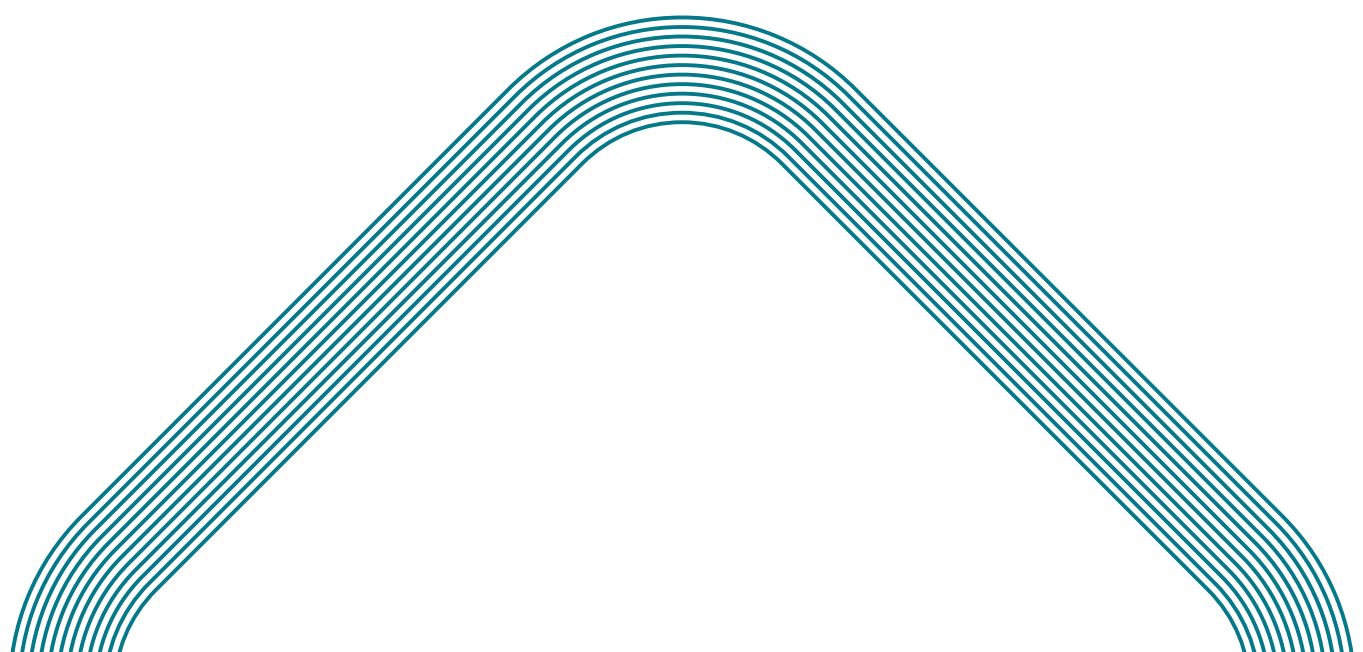
By 2030, the number of inward degree mobile tertiary graduates from outside the EU should be at least 350 000. The latest figure is 249 340. \*

Equity

16.3% (2022)



By 2030, the share of learners from disadvantaged socio-economic backgrounds with a good achievement in at least one domain (reading, mathematics or science) should be at least 25%. The latest figure is 16.3%. †







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