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Structural indicators for monitoring education and training systems in Europe 2022

Overview of major reforms since 2015

Eurydice background report

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2022

Overview of major reforms since 2015

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Authors EACEA:
Teodora Parveva (coordinator), Akvile Motiejunaite, Sogol Noorani and Jari Riiheläinen

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European Education and Culture Executive Agency
Platforms, Studies and Analysis
Avenue du Bourget 1 (J-70 – Unit A6)
BE-1049 Brussels
Email: eacea-eurydice@ec.europa.eu
Website: https://eurydice.eacea.ec.europa.eu/

CONTENTS

INTRODUCTION

This report contains more than 30 key structural indicators on education policies in five areas: early childhood education and care (ECEC), achievement in basic skills, early leaving from education and training (ELET), higher education and digital competence.

Policy context

The indicators provide information on the national policies and structures that contribute to achieving the objectives of the new strategic framework for European cooperation in education and training (2021–2030) ([1]).

The performance of the EU and its Member States regarding these objectives is analysed in detail in the European Commission's *Education and Training Monitor*. The Eurydice project on structural indicators for monitoring education and training systems in Europe contributes to the contextual information for this analysis. It provides yearly data, from 2015 onwards, which illustrate the main policy developments in education and training systems across Europe. For the first time, this edition of the structural indicators contains information on key policies on digital competence, as well.

Selection of indicators

The structural indicators were selected by the European Commission's Directorate-General for Education and Culture using information from recent Eurydice reports that provide an extensive focus on specific policy areas.

The selection of the structural indicators was discussed with the Eurydice national units and country representatives of the Standing Group on Indicators and Benchmarks.

2022 update

This report contains the updated indicators for the 2021/2022 school/academic year together with a short overview of the major reforms since the start of the 2014/2015 school/academic year in five policy areas:

1. Early childhood education and care (ECEC),
2. Achievement in basic skills,
3. Early leaving from education and training (ELET),
4. Higher education,
5. Digital competence

Information on the scope of each indicator, along with detailed definitions of the terms used, can be found in Section 6.

Further information on recent reforms in all countries in the Eurydice network can be found in the Education system descriptions, chapter 14.

Part of the information in this report that concerns the EU Member States was published in the *Education and Training Monitor 2022*.

([1]) Council Resolution of 19 February 2021 on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021–2030), 2021/C 66/1.

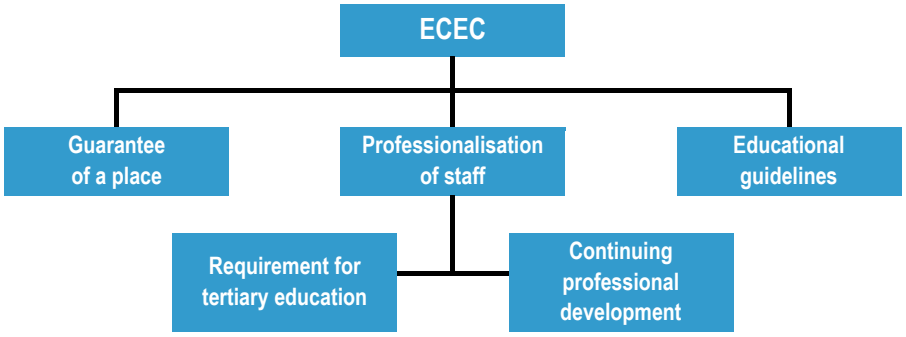
Country coverage

The 2022 update of the structural indicators covers the EU Member States, as well as Albania (only for digital competence), Bosnia and Herzegovina, Iceland, Liechtenstein, Montenegro, North Macedonia, Norway, Serbia and Türkiye. The information was collected through a questionnaire completed by the national representatives of the Eurydice network.

1. EARLY CHILDHOOD EDUCATION AND CARE

The structural indicators in this chapter provide an overview of some key features of early childhood education and care (ECEC) systems. The choice of indicators was based on the research literature analysis and the factors listed in the Council recommendation on high-quality early childhood education and care systems ([2]). The recommendation identified five main aspects of quality in early childhood education and care: access, staff, curriculum, evaluation/monitoring and governance/funding.

However, considering the vast range of possible system-level information and bearing in mind the limitations of scope and time, only several essential and robust indicators have been chosen for yearly monitoring. The diagram below indicates the ECEC structural indicators covered in the Eurydice data collection.



In this analysis, **ECEC** refers to provision for children from birth through to compulsory primary education that falls within a national regulatory framework, i.e. which must comply with a set of rules, minimum standards and/or undergo accreditation procedures. Only centre-based provision is considered. Home-based provision or child-minding services are out of scope. The definition goes beyond the education programmes classified as International Standard Classification of Education (ISCED) level 0 (early childhood education), as it includes all registered ECEC services, not only those with a defined educational component. In many European countries, the ECEC provision for children under age 3 does not qualify as 'early childhood educational development' (ISCED level 010), but it still offers an important service for children and their families.

Many European countries structure ECEC services according to the age of the children. Usually, the transition from the first phase to the second takes place when children are around 3 years old. In order to reflect the different regulations, a distinction is often made between the provision for children under 3 years old and for children of 3 years and over. However, it is important to keep in mind that in some countries the transition can be as early as 2.5 years or as late as 4 years of age.

Some European countries have several types of ECEC provision. The indicators show if a certain measure is available in the main type of ECEC provision for each age group.

([2]) OJ C 189, 5.6.2019, p. 4–14. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.C_.2019.189.01.0004.01.ENG&toc=OJ:C:2019:189:TOC

Overview of reforms and policy developments since 2015

Since 2014/2015, when the structural indicators on ECEC were first gathered, there have been substantial changes in the **legal framework that guarantees access** to ECEC in several EU Member States. Eight countries have introduced compulsory ECEC for one year prior to starting primary education, and another three countries have prolonged the period of mandatory attendance to 2–3 years. Moreover, a few countries are extending the ages of the legal right to ECEC for every child.

Attending the last year of ECEC has been made **compulsory** in Belgium (from the school year starting September 2020), Czechia (2017), Croatia (2014), Lithuania (2016), Romania (2020), Slovakia (2021), Finland (2015) and Sweden (2018).

Three countries have made compulsory attendance longer than one year. In Hungary, ECEC has been compulsory for children from the age of 3 since September 2015. In France, the starting age of compulsory education has been lowered from age 6 to 3 since September 2019. Greece has gradually lowered the starting age of compulsory pre-primary school attendance from age 5 to age 4 (2021). Bulgaria is gradually introducing compulsory education for 4-year-olds (this aims to be implemented in all municipalities by 2023–2024). Cyprus is planning to introduce compulsory education for 4-year-olds from 2025.

A **legal entitlement** to ECEC has been introduced or extended in Czechia, Poland and Portugal. These countries have imposed a statutory duty on ECEC providers in a catchment area to secure publicly subsidised ECEC provision for all children of a certain age whose parents require a place. Czechia and Poland have been gradually extending the entitlement to age 3 (this has been fully implemented in Poland from 2017 and in Czechia from 2018). Portugal lowered the start of universal pre-school education (ISCED level 020) to age 3 from September 2018, and a strategy was carried out to adjust the pre-school network to parents' needs. A gradual expansion of the universal guarantee to pre-school education has been adopted in Lithuania. According to this plan, 2-year-olds will have a place guaranteed from 2025. In Slovakia the preparation of legal entitlement for 4-year-olds since 2024 and 3-year-olds since 2025 is under way.

There have been substantial reforms aiming to improve the quality and governance in ECEC in some countries. It is important to mention Italy, which is going through a major restructuring of the ECEC system. An integrated ECEC system from birth till age 6 is being introduced: the two components of ECEC (nursery services and pre-schools) have been integrated into a single framework with the aim of enhancing quality, effectiveness and numbers of providers all over the country.

Several countries have introduced structural reforms concerning **staff qualification or continuing professional development** (CPD). Ireland, Italy, Malta and Finland have raised or are in the process of raising a minimum qualification requirement for all or for a large proportion of staff working with children. In these countries, supporting systems of CPD to attain the necessary degrees have been established. However, the process of staff professionalisation is still ongoing. In addition, Belgium (Flemish Community), Bulgaria and Estonia introduced reforms to provide a coherent system for continuing professional development (CPD). Since September 2018 a school type called *Fachschule für pädagogische Assistenzberufe*, i.e. school for pedagogical assistant professions (ISCED level 3), operates in Austria. In Czechia, 8 hours of CPD per year are ensured for staff providing childcare services in children's groups since 2021 October.

Educational guidelines have been established for the youngest children for the first time in Belgium (Flemish Community) and in France. In Belgium (Flemish Community), a non-binding pedagogical framework for childcare settings for babies and toddlers (under 2.5 years of age) is being implemented from 2015/2016. In 2017, France adopted the national framework for early childhood care for services outside the ISCED classification (mainly ECEC provision for children under age of 3 years). This non-binding document sets the main principles and values for safe child development and provides some educational guidance. In Italy, national guidelines for educational services for children under the age of 3 years were issued at the beginning of 2022. A joint training activity has started for all those who carry out educational/pedagogical and management activities in ECEC institutions. Currently, Portugal is in the process of drafting/adapting the educational guidelines for the ECEC provision for children under age 3.

New ECEC educational guidelines are in place in several countries. In 2016, new curriculum for pre-school education (children aged 3 and over) was introduced in Bulgaria and Cyprus (preschool education curriculum). Croatia adopted the new national curriculum for early and pre-primary education (2014), followed by amendments to the preschool programme in 2018. In Slovakia, a new state educational programme for pre-primary education is applied in all ECEC settings for 3–5-year-olds from 2016. In Finland, a new national core curriculum for pre-primary education is in place since 2016 and for ECEC since 2017. Norway introduced a new framework plan for kindergartens in 2017. In France, new educational guidelines apply since September 2020 for ISCED level 020 settings (targeting children aged 3 and over). Romania adopted a new curriculum in 2019 that proposes a unitary approach to early education and care from birth to age 6, as there were previously different guidelines for each group. In Italy, educational guidelines for the integrated system (for children aged 0–6 years) were issued at the end of 2021.

A few countries changed their ECEC educational guidelines or introduced new areas of instruction. Lithuania (2015) updated its pre-primary curriculum (for the last year of ECEC) and established a detailed achievement list of children in ECEC. Poland introduced an area ‘Preparation to use a modern foreign language’ (since 2014) as well the development of reading, writing and mathematical skills (since 2017) in the pre-school core curriculum for children aged 3 and over. In Portugal, the educational guidelines for children aged 3 and over have been reviewed and updated (2016). In Greece, a pilot project on creative engagement in English language and soft skills workshops have been included in the pre-school curriculum (children aged 4 and over) from 2020/2021.

ECEC summary table 1: Legal framework, 2021/2022

	Starting age		
	Universal legal entitlement to ECEC	Compulsory ECEC	Compulsory primary education
Belgium BE fr	2y 6m	5y	6y
Belgium BE de	3y	5y	6y
Belgium BE nl	2y 6m	5y	6y
Bulgaria		5y	7y
Czechia	3y	5y	6y
Denmark	6m		6y
Germany	1y		6y
Estonia	1y 6m		7y
Ireland			6y
Greece		4y	6y
Spain	3y		6y
France		3y	6y
Croatia		6y	7y
Italy			6y
Cyprus		4y 8m	6y
Latvia	1y 6m	5y	7y
Lithuania		6y	7y
Luxembourg	3y	4y	6y
Hungary		3y	6y
Malta			5y
Netherlands		5y	6y
Austria		5y	6y
Poland	3y	6y	7y
Portugal	3y		6y
Romania		5y	6y
Slovenia	11m		6y
Slovakia		5y	6y
Finland	9m	6y	7y
Sweden	1y	6y	7y
Bosnia and Herzegovina		5y	6y
Iceland			6y
Liechtenstein	4y		6y
Montenegro			6y
North Macedonia			6y
Norway	1y		6y
Serbia		5y 6m	6y 6m
Türkiye			5y 9m

NB: The abbreviation 'y' means years, 'm' means months.
A universal legal entitlement to ECEC exists when every child of a certain age has an enforceable right to benefit from ECEC provision.

ECEC summary table 2: Selected quality aspects, 2021/2022

	1.2. Staff		1.3. Curriculum
	1.2.1. At least one staff member with a tertiary qualification in education sciences	1.2.2. CPD professional duty or necessary for promotion	or educational guidelines
Belgium BE fr	■	●	●
Belgium BE de	■	●	■
Belgium BE nl	■	●	●
Bulgaria	●	■	■
Czechia		●	■
Denmark			●
Germany	●		●
Estonia	●	●	●
Ireland			●
Greece	●	■	■
Spain	■	■	●
France	●	●	●
Croatia	●	●	●
Italy	■	■	■
Cyprus	■	■	■
Latvia		●	●
Lithuania	●	●	●
Luxembourg	■	●	●
Hungary	■	●	●
Malta		■	●
Netherlands	■		■
Austria		●	●
Poland	■	■	■
Portugal	●	■	■
Romania		●	●
Slovenia	●	●	●
Slovakia		■	■
Finland	●	●	●
Sweden	●		●
Bosnia and Herzegovina	●	●	●
Iceland	●	●	●
Liechtenstein	■	●	●
Montenegro	●	●	●
North Macedonia	■	●	●
Norway	●		●
Serbia	■	●	●
Türkiye	■	●	●

NB: ■ = children aged 3 years or more ([3]); ● = the entire ECEC phase (from birth to the start of compulsory education).
1. Tertiary qualification in education = minimum 3 years (ISCED level 6).
2. CPD refers to continuing professional development.

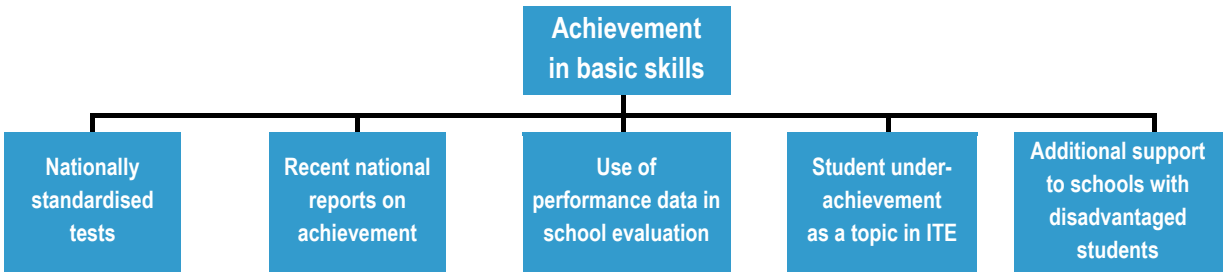
([3]) ■ Refers to children aged 2.5 years or more in Belgium (French and Flemish Communities) and to children aged 4 years or more in Greece, the Netherlands and Liechtenstein.

2. ACHIEVEMENT IN BASIC SKILLS

Low student achievement in the basic skills of literacy/mother tongue, mathematics and science is a concern for many European countries. It is an issue associated not only with the effectiveness of teaching and learning, but also with providing an equitable system of education. Recognising the need for sustained action, the Council of the European Union agreed an EU-level target related to basic skills, which aims to reduce the proportion of 15-year-olds underachieving in reading, mathematics and science to less than 15 % by 2030 ([4]).

However, underachievement – defined as performing below level 2 in the Programme for International Student Assessment (PISA) test – continues to be a serious challenge across Europe. The latest PISA results from 2018 show that 21.7 % of EU students had low achievement in reading, 22.4 % in mathematics and 21.6 % in science. Across the EU as a whole, underachievement increased in science and reading and remained stable in mathematics over the past decade (*PISA 2018 and the EU: Striving for social fairness through education* ([5]).

The structural indicators below focus on a selection of policies and measures that could contribute to improving student achievement. All indicators concern compulsory education, which in the majority of European countries corresponds to ISCED levels 1 and 2.



The selected indicators relate to competences in three distinct areas, i.e. literacy, mathematics and science. These are often treated separately and given different emphasis in national policies. Evidence shows that there is usually more focus on literacy and numeracy than on science.

Overview of reforms and policy developments since 2015

The **national testing** of students has emerged as an important instrument of education policy. It is a widespread practice in Europe but takes different forms, including sample-based testing. Only a minority of European education systems do not systematically organise national tests in the basic skills. However, due to the COVID-19 pandemic, there have been changes in the timeline and mechanisms for organising national tests in the past two years. In some cases, national tests were cancelled or postponed, or alternative testing methods were employed ([6]).

Most European countries publish **national reports on achievement** in each of the basic skills based on national performance data. In many cases, these reports are complemented by reports based on the country results from international surveys such as PISA, the Trends in International Mathematics

([4]) Council Resolution of 19 February 2021 on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030). 2021/C 66/1.
([5]) European Commission, *PISA 2018 and the EU – Striving for social fairness through education*, Publications Office of the European Union, 2019.
([6]) For more information on changes to examinations and national tests in mathematics and science due to COVID, see European Commission/EACEA/Eurydice, 2022. *Increasing achievement and motivation in mathematics and science learning in schools,* pp.69–77.

and Science Study (TIMSS) and Progress in International Reading Literacy (PIRLS). Moreover, in around a third of countries, national reports are based solely on the results of international surveys. In terms of the subject areas covered by these reports, as with the previous indicator on national testing, it appears that performance in the language of instruction and mathematics is analysed much more often than performance in science.

Across Europe, the **evaluation of schools** has become increasingly important for monitoring the overall quality of education. In most cases, school evaluators examine a variety of data from different sources, which can include different types of **student performance data**.

In most countries where the external evaluation of schools is practised, evaluators take student performance data into account to form their judgement on school quality. This is not the case in Greece ([7]), Cyprus, Slovenia, Slovakia, and Norway, where external school evaluation is concerned with school processes and compliance with regulations. Moreover, several countries do not carry out any external school evaluation (Croatia ([8]), Finland and Bosnia and Herzegovina). In the past years, a major reform in Bulgaria led to the introduction of external school evaluation and the use of student performance data in it.

Teachers' ability to deal with student difficulties and their skills in managing students with a range of different abilities and needs are crucial. A number of countries stipulate that the **competences needed to tackle low student achievement** should be acquired during **initial teacher education (ITE)**.

The education authorities in half of all European systems provide central-level regulations, recommendations and/or guidelines for ITE programmes that specify that prospective teachers should learn how to address student difficulties during their training. Central-level involvement in determining the content of ITE programmes varies between countries. The diverse approaches are reflected in the differing degrees of detail in guidance documents and the variety of practices both at national level and at the level of individual higher education institutions. In some cases, only general guidelines are provided without specifying particular subjects. Again, science is the area that is less likely to be mentioned explicitly. It is also significant that in the rest of education systems there are no such guidelines, which is often due to the fact that in these cases higher education institutions are completely autonomous in determining the content of their teacher education programmes.

The central education authorities in around two thirds of all education systems allocate **additional resources to schools that enrol large numbers of disadvantaged students**. There are a variety of approaches in terms of the organisation of the support, the groups targeted and actions funded.

In most countries, schools receive the additional funding directly from the central authorities, although in many cases local authorities are also involved. In some countries, financial flows are rather complex because several levels of authorities (central, regional, local) are involved in the allocation of funding. Moreover, in some cases, in addition to the centrally allocated funding, education providers / schools can apply for extra funds for specific purposes.

([7]) In the 2021–2022 school year, national tests on achievement and school evaluations are carried out in a pilot in 300 primary schools and 300 lower secondary schools. See http://iep.edu.gr/el/arxiki-eedx and http://iep.edu.gr/el/deltia-typou-genika/pisa.

([8]) The pilot project 'External Evaluation of Primary and General Upper Secondary Schools' (*Vanjsko vrednovanje osnovnih škola i gimnazija*) started at the end of 2017 and represents the first phase in the preparation of the introduction of a comprehensive system of external evaluation of educational institutions. See https://www.ncvvo.hr/vanjsko-vrednovanje/vanjsko-vrednovanje-odgojno-obrazovnih-ustanova/pilot-projekt-vanjskoga-vrednovanja-osnovnih-skola-gimnazija/.

Central authorities **do not** allocate such additional resources in Denmark, Croatia, Hungary, Romania, North Macedonia and Norway. In Denmark and Norway this is done at the level of municipalities. In other countries, additional resources for these purposes are provided mainly through social programmes (Romania) or EU and other international projects (North Macedonia). In certain cases (Denmark and Hungary), central-level support is not financial, but focuses on reinforcing the professional development of teachers, providing remedial classes and other educational support.

Across Europe, additional support is most commonly linked to socioeconomic background, migrant status and disability. Criteria like geographical location and ethnic origin are used less often. Targeted funds are used most often to provide additional staff – educational or other professionals, the creation of specific professional development opportunities to improve teachers' competences in providing inclusive education and for career advice services. In the past 7 years, reforms in this area have led to the establishment of a scheme for additional support to disadvantaged students (Malta) or to the reinforcement of existing support (e.g. Czechia, Germany, Spain and Slovenia) ([9]). Finally, to counter the negative impact of COVID-19, several education systems have launched new initiatives in support of disadvantaged students and schools in the past 2 years.

In conclusion, the review of the structural indicators on achievement in basic skills demonstrates that while most countries organise national standardised tests and publish national reports on achievement, not all three basic skills are treated equally, and science is given less attention. Moreover, many countries use student performance data in external school evaluation, but only around half have issued national guidelines to include tackling student underachievement as a topic in ITE. Finally, while most countries provide some type of central support to schools with large numbers of disadvantaged students, there is a great variety of approaches in terms of the organisation of the support, the target groups and actions funded.

Overall, there have been few policy changes and reforms across the indicators on achievement in basic skills in the past 8 years. This could be seen as an indication that these areas do not seem to be a priority for policy action, even though in many countries there are no major improvements in student achievement as measured by the PISA survey.

([9]) For more information on support to disadvantaged schools, see European Commission/EACEA/Eurydice, 2020. *Equity in school education in Europe,* pp.173–186.

Summary table on achievement in basic skills, 2021/2022 (*)

	2. Recent national reports on achievement			3. Use of performance data in school evaluation	4. Guidelines on underachievement as a topic in ITE			5. Additional resources provided by top-level authorities to schools with disadvantaged students
Belgium BE fr	R	M	S	●	R	M	S	●
Belgium BE de	R	M	S	●	R	M	S	●
Belgium BE nl	R	M	S	●	R	M	S	●
Bulgaria	R	M	S	●				●
Czechia	R	M	S	●				●
Denmark	R	M	S	●	R	M	S	
Germany	R	M	S	●	R			●
Estonia	R	M	S	●	R	M	S	●
Ireland	R	M	S	●	R	M		●
Greece	R	M	S					●
Spain	R	M	S	●	R	M	S	●
France	R	M	S	●	R	M	S	●
Croatia	R	M	S					
Italy	R	M		●				●
Cyprus	R	M	S		R	M	S	●
Latvia	R	M	S	●				●
Lithuania	R	M	S	●	R	M	S	●
Luxembourg	R	M		●	R	M	S	●
Hungary	R	M	S	●	R	M	S	
Malta	R	M	S	●	R	M	S	●
Netherlands	R	M	S	●				●
Austria	R	M		●	R	M	S	●
Poland	R	M	S	●	R	M	S	●
Portugal	R	M	S	●				●
Romania	R	M	S	●				
Slovenia	R	M	S					●
Slovakia	R	M						●
Finland	R	M						●
Sweden	R	M	S	●	R	M	S	●
Bosnia and Herzegovina	R	M	S					●
Iceland	R	M		●				●
Liechtenstein	R	M		●				●
Montenegro	R	M	S	●				●
North Macedonia	R	M	S	●	R	M	S	
Norway	R	M	S		R	M	S	
Serbia	R	M	S	●				●
Türkiye	R	M	S	●				●

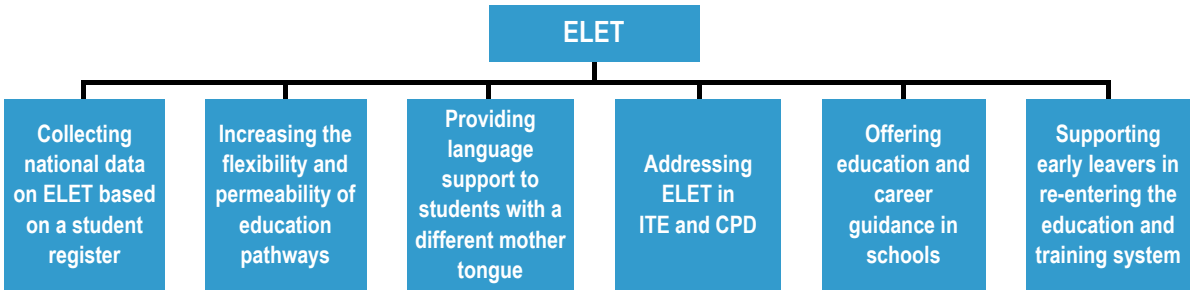
NB: 'R' = reading; 'M' = mathematics; 'S' = science.

(*) No data collection on indicator 1. National tests in compulsory education for the 2021/2022 school year.

3. EARLY LEAVING FROM EDUCATION AND TRAINING

The structural indicators on early leaving from education and training (ELET) ([10]) focus on certain key policies and measures that together cover the three main areas of action – prevention, intervention and compensation – as highlighted in the Council recommendation of 28 June 2011 ([11]). The need to continue to bring down the rate of ELET and for more young people to obtain an upper secondary education qualification was reiterated in the Council resolution of 19 February 2021. A new EU-level target was agreed: the share of early leavers from education and training should be less than 9 %, by 2030 ([12]).

This set of structural indicators provides an overview of recent reforms and policy developments of some of the main activities taking place in European countries to achieve the EU-level target on ELET. The indicators focus on school education: primary, general secondary and school-based initial vocational education (ISCED levels 1, 2 and 3). Since 2015, when the structural indicators on ELET were first gathered, there have been many reforms in all of the following six areas.



Overview of reforms and policy developments since 2015

A **national data collection system based on a student register** can be used to understand the scale of the problem and to develop and implement appropriate policies to address ELET. Such a system can also be employed to both monitor absenteeism and evaluate the effectiveness of policies to reduce early leaving. Since 2015, more and more European education systems have put in place such a data-collection system, making it possible to monitor absenteeism and analyse early-school-leaving patterns at different levels – school, local, regional and national. In 2021/2022, the majority of European countries are collecting national data on ELET through a student register.

Policies for **increasing the flexibility and permeability of education pathways** can help prevent ELET by removing potential obstacles to the completion of education and training programmes. These might include initiatives to promote alternative education and training pathways (e.g. vocational or technical rather than general), to facilitate the transition between pathways and to improve systems for the recognition of students' skills and qualifications. In 2021/2022, almost all European countries have policies in place to promote alternative education and training pathways; and measures exist in many

([10]) Early leaving from education and training (ELET) refers to students leaving education or training before completing the upper secondary level and thus not obtaining the corresponding school-leaving certificate. However, the structural indicators on ELET focus on the whole period of school education: primary education, general secondary and school-based initial vocational education (ISCED levels 1, 2 and 3).
([11]) Council Recommendation of 28 June 2011 on policies to reduce early school leaving, OJ C 191, 1.7.2011.
([12]) Council Resolution of 19 February 2021 on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021–2030). 2021/C 66/1.

countries to facilitate transitions between the different pathways. In Slovakia, conceptual and legislative steps have been taken as of 2022 to introduce a system for the recognition of qualifications.

Language support for students with a mother tongue other than the language of instruction can be crucial as these students are often at increased risk of early leaving. The great majority of European countries already had such policies in place in 2015. Further developments in this area have mainly been focused on intensifying this support. In 2020/2021, reforms occurred in Iceland resulting in better access to language tests and language classes for non-Icelandic speakers. In Czechia, Spain, Portugal and Slovenia additional policies and measures were introduced leading to increased language support for students with a different mother tongue.

Addressing ELET in ITE and/or in CPD is essential if teachers are to know how to support students who are showing signs of disengagement at school, and who are therefore at risk of leaving school early. This was an area addressed by a relatively small number of countries in 2015, but which has since become the focus of top-level policies and measures in an increasing number of countries. Despite these positive developments across Europe, this current update of the structural indicators shows that educating and training teachers on issues relating to ELET is still an area where comparatively fewer policies can be found.

The role of **education and career guidance services** in preventing students from leaving education and training is widely acknowledged. In order to strengthen this area in schools, several countries have introduced reforms since 2015 to ensure that education and career guidance is not only delivered through school-based guidance or counselling services, but also through the national curriculum, thus systematically reaching all students. These developments are in addition to the existing support provided by the school guidance services in all these countries. This two-way approach to promoting education and career guidance in schools is now (in 2021/2022) promoted through top-level policies in about two-thirds of European countries.

Support for early leavers to re-enter the education and training system has been strengthened through a number of policy developments since 2015. These have involved the provision of second-chance education, education and career guidance and/or 'Youth guarantee'-related education and training initiatives ([13]). Reforms in this area have occurred in 2021/2022 in Slovakia through the introduction of the Lifelong learning and counselling strategy for 2021–2030. Currently, almost all European countries have policies promoting second-chance education for early leavers, and most of them support early leavers through targeted education and career guidance and through 'Youth guarantee'-related initiatives supporting early leavers in re-entering the education and training system.

([13]) The 'Youth guarantee' is a commitment by all Member States to ensure that all young people under the age of 25 receive a good quality offer of employment, further education, apprenticeship or traineeship within a period of 4 months of becoming unemployed or leaving formal education. See the Council Recommendation of 30 October 2020 on A Bridge to Jobs – Reinforcing the Youth Guarantee and replacing the Council Recommendation of 22 April 2013 on establishing a Youth Guarantee, OJ C 372, 4.11.2020.

ELET summary table 1, 2021/2022

	1. National data collection on ELET based on a student register	2. Policies for increasing the flexibility and permeability of education pathways:			3. Policies for language support for students with a different mother tongue
		2.1. Providing alternative education and training pathways	2.2. Facilitating transitions within education and training systems	2.3. Recognising skills and/or qualifications	
Belgium BE fr	●	●	●	●	●
Belgium BE de		●	●	●	●
Belgium BE nl	●	●	●	●	●
Bulgaria	●	●		●	●
Czechia	●	●	●	●	●
Denmark	●	●	●	●	●
Germany		●	●		●
Estonia	●	●	●	●	●
Ireland	●	●		●	●
Greece	●	●	●	●	●
Spain		●	●	●	●
France	●	●	●	●	●
Croatia	●		●	●	●
Italy	●	●	●	●	●
Cyprus	●	●	●		●
Latvia	●	●	●	●	●
Lithuania	●	●	●	●	●
Luxembourg	●	●	●	●	●
Hungary	●	●			
Malta	●	●	●	●	●
Netherlands	●	●	●		●
Austria	●	●	●		●
Poland	●	●	●	●	●
Portugal		●	●	●	●
Romania	●	●	●	●	●
Slovenia		●	●	●	●
Slovakia	●	●	●		●
Finland	●	●	●	●	●
Sweden	●	●	●	●	●
Bosnia and Herzegovina	●				
Iceland	●	●			●
Liechtenstein	●	●	●	●	●
Montenegro	●	●	●	●	●
North Macedonia	●	●	●	●	
Norway	●	●	●		●
Serbia		●			●
Türkiye	●				

ELET summary table 2, 2021/2022

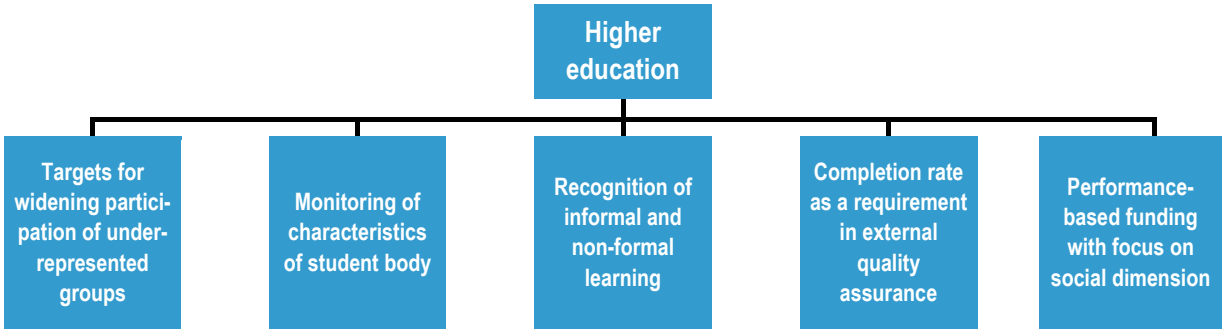
	4. Policies encouraging the inclusion of ELET in ITE and/or CPD	5. Education and career guidance in schools (ISCED levels 2 and 3) (*)	6. Policies to support early leavers in re-entering the education and training system:		
			6.1. Second-chance education	6.2. Education and career guidance	6.3. Youth guarantee
Belgium BE fr	●	●	●	●	●
Belgium BE de	●	●	●		
Belgium BE nl	●	●	●	●	●
Bulgaria		●	●	●	●
Czechia		●	●	●	●
Denmark	●		●	●	●
Germany	●	●	●	●	●
Estonia	●	●	●	●	●
Ireland	●	●	●	●	●
Greece	●	●	●	●	●
Spain	●	●	●	●	●
France	●	●	●	●	●
Croatia			●	●	●
Italy	●	●	●		●
Cyprus	●	●	●	●	●
Latvia	●	●	●	●	●
Lithuania		●	●	●	●
Luxembourg	●		●	●	●
Hungary	●	●	●		●
Malta	●	●	●	●	●
Netherlands	●		●	●	●
Austria	●	●	●	●	●
Poland		●	●	●	●
Portugal	●	●	●	●	●
Romania		●	●	●	●
Slovenia	●	●	●	●	●
Slovakia		●	●	●	●
Finland		●	●	●	●
Sweden	●	●	●	●	●
Bosnia and Herzegovina			●		
Iceland					
Liechtenstein		●	●	●	
Montenegro	●		●		
North Macedonia			●	●	●
Norway		●	●	●	
Serbia		●	●		
Türkiye		●	●		

(*) Education and career guidance provided both as a compulsory part of the curriculum **and** by school guidance services in lower and upper secondary education.

4. HIGHER EDUCATION

In 2008, the Council adopted an EU-wide benchmark on tertiary education, stating that by 2020 at least 40 % of 30–34-year-olds should have a tertiary or equivalent-level qualification ([14]). This benchmark was part of the double headline target on education within the Europe 2020 growth strategy. According to Eurostat data, this target was reached in 2019 ([15]). To emphasise the need for further progress in this area, in 2021 the Council agreed a new EU-level target on tertiary-level attainment, which states that 'The share of 25–34-year-olds with tertiary education attainment should be at least 45 %, by 2030' ([16]).

The following five structural indicators were developed in relation to the EU-level priorities, and guided by the Commission's communication, 'Supporting growth and jobs: An agenda for the modernisation of Europe's higher education systems' ([17]). Among the Communication's main objectives are two key interlinked policy goals: increasing and widening participation and improving the quality and relevance of higher education. To achieve these goals, the following indicators were chosen.



Related to these indicators, the Commission's communication of 30 September 2020 on achieving the European Education Area by 2025 ([18]) defines inclusion – ensuring that higher education is accessible to diverse student populations – as one of its key objectives. Furthermore, the Council, in its resolution for setting out the targets for 2030, stated that 'education and training systems should become more flexible, resilient, future-proof, and appealing, reaching out to a more diverse learner body and offering recognition and validation of prior learning, upskilling and reskilling training opportunities, including at higher qualification levels and throughout the working life… Moreover, to reinforce cooperation between education institutions and foster mobility, there is still work to be done in areas such as the automatic mutual recognition of qualifications and study periods abroad and quality assurance' ([19]).

([14]) Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training ('ET 2020'), OJ C 119, 28.5.2009.
([15]) Eurostat press release of 22 April 2020 (https://ec.europa.eu/eurostat/documents/2995521/10749941/3-22042020-BP-EN.pdf/04c88d0b-17af-cf7e-7e78-331a67f3fcd5).
([16]) Council Resolution of 19 February 2021 on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021–2030). 2021/C 66/1.
([17]) Communication from the European Commission, 2011. 'Supporting Growth and Jobs: An Agenda for the Modernisation of Europe's Higher Education Systems'. COM (2011) 567 final. Luxembourg: Publications Office of the European Union.
([18]) Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on achieving the European Education Area by 2025. COM(2020) 625 final. Brussels.
([19]) Council Resolution of 19 February 2021 on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021–2030). 2021/C 66/1.

Overview of reforms and policy developments since 2015

In the area of higher education, there were some reforms since 2015. Indicators with new policies were quantitative targets in terms of widening participation and attainment of under-represented groups, completion as a required criterion in external quality assurance, and performance-based funding with a focus on the social dimension.

For the indicator on widening participation of under-represented groups, quantitative targets have been issued in the gender equality strategy for 2021–2030 in Czechia ([20]).

For the indicator on recognition of informal and non-formal learning, in Austria, paragraph 56 of the 2002 Universities Act was amended in 2021. A new undergraduate admission procedure for people with non-formal or informal qualifications wishing to continue their education will be recognised by universities. With this new procedure, universities will deliver professional Bachelor degrees (BA prof) in collaboration with non-university educational institutions'. Informal qualification means qualified work experience of several years.

Regarding performance-based funding with a focus on the social dimension, in Hungary, the Ministry for Innovation and Technology has entered into a framework agreement with 21 model exchange institutions in 2021. This agreement includes a set of conditions for the financing of public tasks directly performed by the foundation which owns and maintains the higher education institution. The agreement specifies, among other things, the indicators for social-dimension-based funding, such as the number of disabled students actively enrolled in the higher education institution; the number of students actively enrolled in the higher education institution from specific territories that have been categorised as 'to develop'; and the number of students actively enrolled in the higher education institution who are raising a child.

Two countries (Romania and Finland) ceased to set quantitative targets for widening participation and attainment of under-represented groups between 2015 and 2021.

When looking at the five indicators for the 2021/2022 reference year, in more than two thirds of the education systems, monitoring of socioeconomic characteristics of the student body was the most widely implemented policy. Also, recognition of prior informal or non-formal learning and the requirement of completion rates was implemented in more than half of the education systems.

The two remaining policies (Indicators 4.1 and 4.5), which focus the most on the social dimension and widening participation in higher education, were implemented in less than half of the education systems, even if there were developments in this area during the 2021/2022 academic year in some countries ([21]). This suggests that while indicators related to the quality and relevance of higher education are implemented in the majority of education systems, there is more work to be done related to the two indicators on widening participation and the social dimension of higher education.

([20]) https://www.vlada.cz/cz/ppov/rovne-prilezitosti-zen-a-muzu/aktuality/vlada-dnes-schvalila-strategii-rovnosti-zen-a-muzu-na-leta-2021–2030-187164/

([21]) For more information on current policies for improving equity and inclusion in higher education, see European Commission/EACEA/Eurydice, 2022. *Towards Equity and Inclusion in Higher Education in Europe.*

Summary table on higher education, 2021/2022

	1. Quantitative targets for widening participation and/or attainment of under-represented groups	2. Monitoring of socioeconomic background of students	3. Recognition of informal or non-formal learning in entry to higher education	4. Completion rates as a required criterion in external quality assurance	5. Performance-based funding mechanisms with a social dimension focus
Belgium BE fr		●	●	●	
Belgium BE de				●	
Belgium BE nl		●	●		●
Bulgaria		●		●	
Czechia	●	●			
Denmark		●	●		
Germany		●	●	●	
Estonia			●	●	
Ireland	●	●	●	●	●
Greece	●			●	
Spain		●	●	●	●
France	●	●	●	●	●
Croatia		●		●	●
Italy		●	●	●	●
Cyprus	●	●		●	
Latvia					
Lithuania		●	●	●	
Luxembourg			●		
Hungary		●	●	●	●
Malta	●	●	●	●	
Netherlands		●			
Austria	●	●	●	●	●
Poland	●	●	●	●	●
Portugal			●	●	●
Romania		●		●	●
Slovenia				●	
Slovakia		●		●	
Finland		●	●		
Sweden		●	●		
Bosnia and Herzegovina					
Iceland			●	●	
Liechtenstein		●	●		
Montenegro			●	●	
North Macedonia		●		●	
Norway		●	●		
Serbia	●	●		●	
Türkiye		●	●		

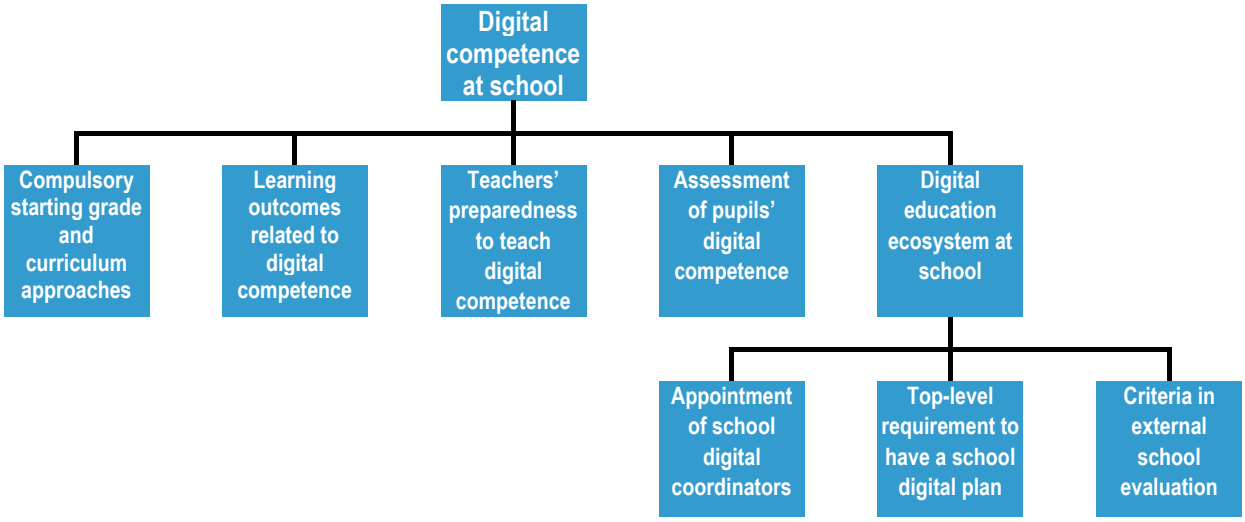
5. DIGITAL COMPETENCE AT SCHOOL

The structural indicators in this chapter provide an overview of key policies that support the development of digital competence at school in Europe. The selection of indicators is based on the strategic priorities outlined in the European Commission's 2021–2027 Digital Education Action Plan, which is a renewed EU policy initiative to support the sustainable and effective adaptation of education and training systems to the digital age ([22]). In particular, the Digital Education Action Plan sets two strategic priorities: promoting the development of a European digital education ecosystem and enhancing digital competence (knowledge, skills and attitudes) of all learners for the digital transformation and a world mediated by digital technologies ([23]). Achieving these priorities requires the implementation of a number of initiatives such as promoting:

- basic digital skills and competences from an early age;
- digital literacy, including tackling disinformation;
- computing education;
- high-quality learning content, user-friendly tools and secure platforms which respect e-privacy rules and ethical standards;
- digitally competent and confident teachers and education and training staff;
- effective digital capacity planning and development, including up-to-date organisational capabilities.

In addition, as a direct follow-up to Action 11 of the Digital Education Action Plan, in February 2021 the Council of the European Union introduced a new target on digital skills. It called for the share of low-achieving eight-graders in computer and information literacy to be less than 15 % by 2030 ([24]).

In line with these EU-level policy priorities and upon the request of the Directorate-General for Education and Culture, the Eurydice network undertook the 2022 trial data collection on structural indicators for digital competence. The diagram below depicts the selection of indicators.



([22]) COM/2020/624 final.
([23]) SWD (2020) 209 final. COM (2020) 624 final.
([24]) OJ C 66, 26.2.2021.

The majority of these indicators are based on the analysis in the 2019 Eurydice report *Digital Education at School in Europe* (European Commission/EACEA/Eurydice, 2019a) and the Eurydice brief *Digital Education at School in Europe* (European Commission/EACEA/Eurydice, 2019b). In order to align with the EU-level digital skills target, the selected indicators cover International Standard Classification of Education (ISCED) levels 1 and 24.

5.1. Compulsory starting grade for teaching digital competence and curriculum approaches

In order to foster the development of digital competence in students, national school curricula need to explicitly include it as from primary education. In this analysis, the term 'national curriculum' is used in a wide sense, referring to any official steering document issued by top-level authorities which contains study programmes, learning content, learning objectives, attainment targets, assessment guidelines or syllabi.

The curriculum approaches to digital competence may include teaching and learning through a cross-curricular topic, a separate subject or several other subjects (integrated approach). National curricula often combine several of these approaches, which are defined as follows.

- **Cross-curricular**. Digital competences are understood to be transversal and are therefore taught across all subjects in the curriculum. All teachers share the responsibility for developing digital competences.
- **Separate subject.** Digital competences are taught as a discrete subject area similar to other traditional subject-based competences.
- **Integrated into other subjects.** Digital competences are incorporated into the curriculum of other subjects or learning areas.

In line with the European target to reduce the share of low achievement in digital skills for all pupils, the focus of this indicator is on the **compulsory curriculum for all pupils**, therefore excluding optional subjects related to digital competences.

5.1.1. Compulsory starting grade for teaching digital competence

One way of understanding the importance given to digital competences by top-level education authorities is to examine the earliest grade from which digital competences are taught at school and whether this is done as a separate subject or as a transversal competence.

Figure 1 shows that in most European education systems the compulsory teaching of digital competences for all pupils starts in primary education (ISCED level 1). In 18 systems this is done as early as the first grade of primary education, and in another seven systems this happens several grades later. The latest compulsory starting grade that has been reported is seventh grade in lower secondary education (ISCED level 24), which concerns the current situation in Cyprus and Malta.

Finally, in several systems (the three Communities of Belgium, Germany, Ireland, the Netherlands, Slovenia, Iceland and Norway) top-level education authorities have not established a compulsory starting grade for the teaching of digital competences for all students. That said, general objectives unrelated to specific grades may exist, such as in Slovenia, and some German *Länder* have introduced compulsory starting grades. In some of these systems, the decision on the starting grade is subject to school and/or local autonomy.

For instance, in **the French and German-speaking Communities of Belgium**, some schools offer projects in informatics in primary education. In lower secondary education, informatics is an optional subject in some schools, but the contents vary across all schools.

In **Ireland**, there is no compulsory starting grade for teaching digital competences to all or most students. Instead, a top-level recommendation aims to assist schools in effectively embedding digital technologies into teaching, learning and assessment. Schools can then use their own local autonomy and come up with their own, bespoke approach to embedding digital technologies in teaching and learning on a school-wide level.

In the **Netherlands**, digital competences are not yet part of the formal curriculum. Schools have autonomy to decide how they integrate digital competences in the curriculum. However, a recent report on monitoring digital competences in primary education has found that 39 % of teachers work on digital skills through other subjects (integrated in other compulsory subjects) ([25]).

5.1.2. Curriculum approaches to teaching digital competence

Across Europe digital competence is being taught using a number of curricular approaches. In certain cases, these approaches could be employed in parallel or they could change depending on the education level. Overall, in primary education, the most common approach is to teach digital competence as a cross-curricular subject, while in lower secondary education this is most often done as a compulsory separate subject. This trend was already observed in the 2019 Eurydice report *Digital Education at School in Europe*.

In terms of the combination of curriculum approaches, a variety of situations can be observed at national level. It is common for two out of the three approaches discussed above to coexist (Denmark, Estonia, Greece, France, Latvia, Luxembourg (only in primary education), Hungary, Austria, Poland, Portugal, Sweden and Montenegro). Some systems (Czech Republic, Liechtenstein and Serbia) even use all three curriculum approaches.

On the other hand, some systems favour only one curriculum approach during both primary and lower secondary education. For instance, in Bulgaria, Slovakia, Bosnia and Herzegovina, North Macedonia and Türkiye, digital competence is taught only as a compulsory separate subject, while in Italy and Finland digital competence is taught only as cross-curricular competence.

Finally, it is also worth noting that digital competence is taught as a compulsory separate subject from first grade in nine countries (Greece, Latvia, Poland, Portugal, Bosnia and Herzegovina, Liechtenstein, Montenegro, Serbia and Türkiye).

([25]) https://ecp.nl/wp-content/uploads/2021/11/Rapportage-ECP-Monitor-Digitale-Geletterdheid-PO-2-november-2021.pdf

Figure 1: Compulsory starting grade and curriculum approaches to teaching digital competence, 2021/2022

		ISCED 1			ISCED 24		
	Compulsory starting grade	Compulsory separate subject	Integrated in other compulsory subjects	Cross-curricular	Compulsory separate subject	Integrated in other compulsory subjects	Cross-curricular
Belgium BE fr	■	■	■	■	■	■	■
Belgium BE de	■	■	■	■	■	■	■
Belgium BE nl	■			×		×	×
Bulgaria	3	×			×		
Czechia	4	×	×	×	×	×	×
Denmark	1		×	×		×	×
Germany							
Estonia	1		×	×		×	×
Ireland			×	×		×	×
Greece	1	×	×		×	×	
Spain	1	■	■	×	■	×	×
France	1		×	×		×	×
Croatia	5				×		
Italy	1			×			×
Cyprus	7		×	×	×		×
Latvia	1	×	×		×		
Lithuania	1		×		×		
Luxembourg	1		×	×	×		
Hungary	3	×		×	×		×
Malta	7			×	×		
Netherlands							
Austria	6		×	×	×	×	
Poland	1	×		×	×		
Portugal	1	×		×	×		
Romania	5			×	×		
Slovenia			×			×	
Slovakia	3	×			×		
Finland	1			×			×
Sweden	1		×	×		×	×
Albania	5		×		×	×	
Bosnia and Herzegovina	1	×			×		
Iceland							
Liechtenstein	1	×	×	×	×	×	×
Montenegro	1	×		×	×		×
North Macedonia	3	×			×		
Norway	■	■	■	■	■	■	■
Serbia	1	×	×	×	×	×	×
Türkiye	1	×			×		

Symbols:

× Exist ■ School/local autonomy

5.2. Learning outcomes related to digital competence

This indicator focuses on how European education systems address digital competences in terms of curriculum content. The European digital competence framework ([26]), DigComp, is used as a reference in terms of defining competences and related learning outcomes.

In this analysis, we do not differentiate between the terms 'learning objectives' and 'learning outcomes'. They can be seen as two sides of the same coin: while learning objectives refer to the content of the development of digital competences from the perspective of the education authorities, school or the teacher, learning outcomes refer to the same content but from the perspective of the learner. In the present context, learning outcomes are defined as statements of what a learner knows, understands and is able to do on completion of a level or learning module. Learning outcomes are concerned with the achievements of the learner rather than the intentions of the teacher (expressed in the aims of a module or course) (Harvey, 2022). Learning outcomes indicate actual attainment levels while learning objectives define the competences to be developed in general terms.

The indicator examines whether national curricula explicitly mention learning outcomes related to key digital competence areas as defined in the DigComp framework. Therefore, we identify the existence of learning outcomes related to **one competence from each of the five competence areas**.

The existence of learning outcomes is only considered if they are associated with compulsory subjects or cross-curricular areas for all pupils.

This analysis focuses on the following five competences.

- In the competence area 'Information and data literacy': learning outcomes related to:
  - Evaluating data, information and digital content
- In the competence area 'Communication and collaboration: learning outcomes related to:
  - Managing digital identity
- In the competence area 'Digital content creation': learning outcomes related to:
  - Programming/coding
- In the competence area 'Safety': learning outcomes related to:
  - Protecting personal data and privacy
- In the competence area 'Problem solving': learning outcomes related to:
  - Creatively using digital technologies

Figure 2 shows that, in line with earlier findings from the 2019 Eurydice report *Digital Education at School in Europe*, the great majority of European systems have included explicit learning outcomes in all five areas of digital competence. Overall, across the five competence areas, learning outcomes are most frequently cited for 'Evaluating data, information and digital content', while relatively less outcomes exist for 'Creatively using digital technologies'.

The French and German-speaking Communities of Belgium ([27]), Ireland, the Netherlands ([28]) and Slovenia reported no or almost no learning outcomes in any of the domains for both education levels. This is often linked to the fact that in these systems digital competences are not taught as part of the

([26]) The digital competence framework 2.0 | EU Science Hub (europa.eu).

([27]) The French Community of Belgium is preparing the adoption of a new curriculum which aims, among other things, to frame the different learning outcomes related to digital competences at the primary and lower secondary levels.

([28]) In the Netherlands, there are currently no legally established learning outcomes/objectives for digital literacy. It is likely that an update of the core objectives for all learning areas will start in 2022. Digital literacy is included in this process.

compulsory curriculum for all students. As a result, specific learning outcomes may exist only in optional subjects, which are not presented in Figure 2 ([29]). Another significant point is that Germany, Croatia and Romania reported learning outcomes related to lower secondary education only.

Figure 2: Learning outcomes related to selected digital competences defined in the DigComp framework, 2021/2022

	Information and data literacy	Communication and collaboration	Digital content creation	Safety	Problem solving
	Evaluating data, information and digital content	Managing digital identity	Programming/ coding	Protecting personal data and privacy	Creatively using digital technologies
Belgium BE fr	24	24			
Belgium BE de					
Belgium BE nl	1 | 24	24	24	1 | 24	24
Bulgaria	1 | 24	1 | 24	1 | 24	1 | 24	
Czechia	1 | 24	24	1 | 24	1 | 24	1 | 24
Denmark	1 | 24	1 | 24	24	1 | 24	1 | 24
Germany	24	24	24	24	24
Estonia	1 | 24	1 | 24	1 | 24	1 | 24	1 | 24
Ireland	24				
Greece	1 | 24	1 | 24	1 | 24	1 | 24	1 | 24
Spain	1 | 24	1 | 24	24	1 | 24	24
France	1 | 24	1 | 24	1 | 24	1 | 24	1 | 24
Croatia	24	24	24	24	24
Italy	1 | 24	1 | 24	1 | 24	1 | 24	1 | 24
Cyprus	1 | 24	24	1 | 24	1 | 24	1 | 24
Latvia	1 | 24	1 | 24	1 | 24	1 | 24	1 | 24
Lithuania	1 | 24	1 | 24	1 | 24	1 | 24	1 | 24
Luxembourg	1 | 24	1 | 24	1	1 | 24	1 | 24
Hungary	1 | 24	24	1 | 24	1 | 24	1 | 24
Malta	1 | 24	1 | 24	1 | 24	1 | 24	1 | 24
Netherlands					
Austria	24	1 | 24	1 | 24	1 | 24	24
Poland	1 | 24	1 | 24	1 | 24	1 | 24	1 | 24
Portugal	1 | 24	1 | 24	1 | 24	1 | 24	1 | 24
Romania	24		24	24	24
Slovenia	1 | 24				
Slovakia	1 | 24		1 | 24	1 | 24	
Finland	1 | 24	1 | 24	1 | 24	1 | 24	1 | 24
Sweden	1 | 24	1 | 24	1 | 24	1 | 24	1 | 24
Albania	24	24	1 | 24	1 | 24	
Bosnia and Herzegovina	1 | 24		24		
Iceland	1 | 24		24	1 | 24	1 | 24
Liechtenstein	1 | 24	1 | 24	1 | 24	1 | 24	1 | 24
Montenegro	1 | 24	1 | 24	1 | 24	1 | 24	1 | 24
North Macedonia	1 | 24	1	1 | 24	1	24
Norway	1 | 24	1 | 24	1 | 24	1 | 24	1 | 24
Serbia	1 | 24	1 | 24	1 | 24	1 | 24	1 | 24
Türkiye	1 | 24	1 | 24	1	1 | 24	1 | 24

1=ISCED 1, 24= ISCED 24

([29]) In Ireland, learning outcomes in lower secondary education exist for the optional junior cycle course in digital media literacy. The specification can be accessed at: https://curriculumonline.ie/Junior-cycle/Short-Courses/Digital-Media-Literacy/.

5.3. Teachers' preparedness to teach digital competence

The strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021–2030) highlights the importance of enhancing competences and motivation in the teaching profession. The Digital Education Action Plan mentions 'digitally competent and confident teachers and education and training staff' among the key elements of a high-performing digital education ecosystem.

Like all citizens, teachers need to acquire the necessary digital skills for their personal and professional lives and to be able to participate in digital society. Being digitally competent and able to use digital technologies in a confident, critical and responsible way is essential for teachers acting as role models for the future generation. However, teachers also need a set of specific competences that will allow them to realise the potential of digital technologies to transform their teaching and learning (Redecker, 2017, p. 15).

Teacher-specific digital competences are the competences needed to support and improve teaching and learning by using digital technologies, along with the ability to use digital technologies for communication, collaboration and professional development. They extend into all areas of a teacher's work, including teaching and learning, assessment, communicating and collaborating with colleagues and parents, and creating and sharing content and resources.

If teachers are to become digitally competent, then the basic knowledge and skills to do so, need to be integrated into initial teacher education (ITE) programmes. This indicator examines whether teacher-specific digital competences are included in ITE curriculum as mandatory competences to be developed. It covers initial teacher education for all teachers except specialist/semi-specialist teachers of information and communication technology subjects / informatics.

Figure 3: Teacher-specific digital competences to be included in ITE curriculum as mandatory element, 2021/2022

	BE fr	BE de	BE nl	BG	CZ	DK	DE	EE	IE	EL	ES	FR	HR	IT	CY	LV	LT	LU	HU
ISCED 1	●			●	●	●		●	●		●	●		●	●	○	●		●
ISCED 24	●			●	●	●		●	●		●	●		●	●	○	●	○	●
	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	AL	BA	IS	LI[30]	ME	MK	NO	RS	TR
ISCED 1				●		●				●					●	●		●	●
ISCED 24	○			●		●				●					●	●			●

● For all teachers' profiles ○ For some teachers' profiles

In 19 systems, top-level authorities require that teacher-specific digital competences be included in ITE curricula as a mandatory element, and this concerns all teachers' profiles. In another three systems – Latvia, Luxembourg and Malta – such competences are only compulsory for some teacher profiles (e.g. informatics, mathematics, languages) and in the latter two countries only in lower secondary education.

In the rest of the European education systems, there are no such top-level requirements. In many of these cases, the providers of initial teacher education have institutional autonomy regarding the content of the courses they offer. The data from the 2019 Eurydice report *Digital Education at School in Europe* points to the fact that at least some ITE institutions provide prospective teachers with the option to develop digital competences, despite the absence of top-level requirements.

([30]) Teachers are trained abroad.

The top-level requirements on the inclusion of teacher-specific digital competences can incorporate a different level of detail. For instance, in the Czech Republic, the methodology for assessing higher education programmes for teaching staff, which is used when approving new programmes or accrediting institutions, states that ICT must be part of the education of prospective teachers. However, it does not describe specific competences or learning outcomes.

In Denmark, the teachers' initial education programme consists of 'Teachers' foundational competences' and 'Teachers' competences in main subjects'. Digital competences are a priority in both. For instance, in the part on 'Teachers' foundational competences', digital competences are addressed directly on five occasions.

1) 'The student has knowledge about teaching methods and analogue and digital learning resources.'
2) 'The student can plan, develop and perform teaching with and about it and media in order to support the pupils' ability to act as a critical examiner, an analysing receiver, a focused and creative producer and a responsible participant'.
3) 'The student has knowledge about it and media competence.'
4) 'The student has knowledge about preventive, expected and intervention efforts and use of these efforts and other pedagogical tools in the daily teaching.'
5) 'The practical use of analogue and digital pedagogical tools and other resources in relation to a pupil's preconditions, ethics of teaching, purpose, goals and substance' ([31]).

In Ireland, the development of digital skills, including digital literacy, is a core element of 'CEIM – Standards for Teacher Education in Ireland' ([32]). In Italy, over time, different laws have defined and updated the requisites to enter the teaching profession, with specific references to digital competences ([33]). In Lithuania, the top-level teacher competence framework includes digital competences for specialist/semi-specialist teachers (i.e. ICT teachers) and for all other teachers separately ([34]). In North Macedonia, ICT technologies in education is an obligatory subject in the fourth semester for future primary school teachers. All higher-education faculties that train secondary-school teachers include informatics as an obligatory subject ([35]).

5.4. Assessment of pupils' digital competence

Brečko et al. (2014, p. 17) highlight that there is a 'consensus among educational stakeholders that what is assessed and examined determine[s] what is valued and what is taught in real settings'. Nevertheless, the assessment of some of the key competences is not straightforward and represents an important challenge for European education systems (European Commission, 2012). As underlined by different stakeholders, key competences and 21st-century skills cannot be assessed through conventional assessment methods – they need innovative approaches (Brečko et al., 2014). The assessment of literacy, science, mathematics and language skills is based on a strong tradition.

([31]) https://www.retsinformation.dk/eli/lta/2015/1068

([32]) https://www.teachingcouncil.ie/en/news-events/latest-news/ceim-standards-for-initial-teacher-education.pdf

([33]) https://www.gazzettaufficiale.it/eli/gu/2017/05/16/112/so/23/sg/pdf; https://www.miur.gov.it/documents/20182/611956/DM+del+10.8.2017+n.+616.pdf/f1f3c9e5-c4f5-453b-8695-bd854c1f8b6d?version=1.0; https://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:2021-12-29;233

([34]) https://e-seimas.lrs.lt/portal/legalActPrint/lt?jfwid=-1c2dtdz08t&documentId=599d489078af11e89188e16a6495e98c&category=TAD

([35]) https://www.pfsko.ukim.edu.mk/?page_id=102

Modern and meaningful assessment methods can be built on this strong base as we also consider new developments in the understanding of the role of assessment and the mechanisms involved. Meanwhile, efforts to assess other key competences, such as cultural awareness, citizenship, or personal and social skills, are still lagging behind (O'Leary et al., 2018).

Digital technologies potentially offer a range of assessment formats that provide many opportunities to capture skills, attitudes and the less 'tangible themes underlying all key competences, such as critical thinking or creativity' (Redecker, 2013, p. 2). Moreover, there is of course a direct link between the use of digital technologies and the assessment of specific digital competences, at least in terms of the more cognitive and practical skills. The assessment of digital competence without the use of digital technologies would seem strange, if not useless. As Beller (2013) noticed, in large-scale standardised assessment contexts, digital technologies are usually used to assess general competences, such as skills related to ICT and the management and communication of information. Also, as highlighted by Redecker (2013, p. 64), many of the most commonly used 'assessment tools for digital competence employ a knowledge-based, traditional multiple choice format', especially when it comes to summative computer-based tests used for certification.

This indicator focuses on the assessment of pupils' digital competence in national tests. Specifically, it looks at the context in which they are tested, for example as a specific national test or through the assessment of other competences, and the level of education at which this takes place.

National tests are defined as standardised tests/examinations authorised by top-level public authorities and carried out under their responsibility. They include any form of test/exam that (a) requires all test takers to answer the same questions (or questions selected from a common bank of questions) and (b) is scored in a standard or consistent way. Tests designed at school level on the basis of a centrally designed framework of reference are not considered national tests. International tests are excluded from the data collection. Similarly, tests based on samples of students aiming to monitor the quality of the education system rather than measuring the attainment levels of individual students are not the focus of this indicator.

This indicator distinguishes between four criteria.

- Digital competences are assessed through **specific national tests**. These specific national tests are dedicated to digital competences, which may be included in subjects such as ICT or informatics. They seek to determine an individual student's level of attainment, usually in relation to a graded scale.
- Digital competences are assessed through **non-specific national tests**. These non-specific national tests evaluate other subjects, such as mathematics, while also testing digital competences. They seek to determine an individual student's level of attainment, usually in relation to a graded scale.
- National tests do not include digital competences.
- No national testing.

In line with earlier findings in the 2019 Eurydice report *Digital Education at School in Europe*, data in Figure 4 demonstrates that the assessment of digital competences through national tests remains uncommon in primary and lower secondary education. Only three education systems (France, Malta and Austria) report that they assess students' digital competences through specific national tests related to individual student achievement. These tests invariably take place in lower secondary education.

For instance, in **Austria**, the acquisition of competencies in the subject of digital literacy (*Digitale Grundbildung*) in lower secondary education is assessed with an online test called 'Digi.check'. It includes reflection and knowledge questions, and its main purpose is to identify learning gaps ([36]).

In Denmark and France digital competences in lower secondary education are assessed through non-specific national tests. In addition, in the Flemish Community of Belgium (lower secondary education), the Czech Republic, Estonia ([37]), France (primary education), Luxembourg and Finland digital competences are assessed through sample tests that aim at monitoring the quality of the education system rather than measuring the attainment levels of individual students. This type of test is not shown in Figure 4.

In the majority of education systems, although national tests are organised, they do not include digital competences ([38]).

Finally, in the German-speaking Community of Belgium, Flemish Community of Belgium (primary education), Greece, Cyprus, Austria (primary education), Poland (primary education), Bosnia and Herzegovina (primary education) and Liechtenstein, no national tests in any competence are organised.

Figure 4: Assessment of pupils' digital competence through national tests, 2021/2022

	BE fr	BE de	BE nl	BG	CZ	DK	DE	EE	IE	EL	ES	FR	HR	IT	CY	LV	LT	LU	HU
ISCED 1	×	◊	◊	×		×	×		×	◊	×		◊	×	◊	×	×		×
ISCED 24	×	◊		×		○	×		×	◊	×	●○	◊	×	◊	×	×		×
	MT	**NL**	**AT**	**PL**	**PT**	**RO**	**SI**	**SK**	**FI**	**SE**	**AL**	**BA**	**IS**	**LI**	**ME**	**MK**	**NO**	**RS**	**TR**
ISCED 1	×	×	◊	◊	×	×	×	×		×	×	◊	×	◊	×	×	×	×	×
ISCED 24	●	×	●	×	×	×	×	×		×	×	×	×	◊	×	×	×	×	×

● Digital competences are assessed through specific national tests

○ Digital competences are assessed through non-specific national tests

× National tests do not include digital competences

◊ No national tests

5.5. Digital education ecosystem at school

Strategic priority 1 in the Digital Education Action Plan aims at fostering the development of high-performing digital education ecosystems. At school level, this involves effective digital capacity planning and development. Under this heading, the proposed indicator looks at three different structural aspects that can contribute to better planning and development.

- **Appointment of digital coordinators.** Delivering digital competence and ensuring that technology is used across the curriculum goes beyond the individual teacher's responsibility. A whole school approach ([39]) is necessary to encourage and sustain change and innovation in teaching and learning (Cachia et al., 2010). Moreover, leadership at school level is an important lever for change. Leaders can motivate staff, set objectives, develop school digital plans,

([36]) https://digicheck.at/

([37]) This test is used to both monitor the quality of the education system and assess the level of digital competence of individual students that participate (in 2021, 49.7 % of all eighth graders).

([38]) In Spain, national tests have been paused until 2023/2024. Nevertheless, some autonomous communities have continued to organise standardised assessments during 2021/2022.

([39]) Such an approach means that the entire school community (school leaders, teaching and non-teaching staff, learners, parents and families) engages in cohesive, collective and collaborative action, with strong cooperation with external stakeholders and the community at large.

coordinate efforts and more generally create a favourable climate for innovation. However, teachers and school leaders may face new challenges when rolling out new digital learning environments or using digital technology for pedagogical purposes. These challenges may affect their motivation and self-confidence in employing digital technologies in the education process. Indeed, the *2nd Survey on Schools on ICT* (European Commission, 2019, p. 48) shows that a lack of pedagogical and technical support is one of the most important obstacles that teachers face in the use of digital technologies. Support for teachers and the wider school in the use of technologies in the education process is usually provided by digital coordinators, also known as ICT coordinators. Digital coordinators generally have responsibilities that cover both technical and pedagogical aspects (Devolder et al., 2010), although an explicit focus on either of these two aspects can also exist.

- **Requirement to have a school digital plan.** A requirement by top-level education authorities for schools to have a development plan which includes digital education, or a specific school digital plan means that the development of both digital competences and innovative teaching and learning methods becomes central to school development as part of a whole school approach. The International Computer and Information Literacy Study showed 'that teachers who were working in schools they saw as supporting ICT use through a planned and collaborative approach were more likely to use ICT in their teaching and emphasize the development of students' computer and information literacy' (European Commission, 2014, p. 6). More recently, the *2nd Survey of Schools on ICT in Education* found that 31 % of students in primary education, 34 % of students in lower secondary education and 30 % of students in upper secondary education attended schools that had written statements specifically on the use of ICT for pedagogical purposes (European Commission, 2019, pp. 98–99).
- **Criteria relating to digital education in external school evaluation frameworks.** At European level, external school evaluation is seen as an approach to quality assurance; it is a widespread practice that aims to monitor the performance of individual schools with a focus on improving their quality, and consequently students' learning outcomes (European Commission/EACEA/Eurydice, 2015). External evaluators usually follow evaluation frameworks or have lists of topics and/or indicators to consider when evaluating the quality of a school (Ibid.). These documents might include criteria specifically relating to digital education, and therefore require evaluators to assess aspects in this area. Most external evaluators are asked to evaluate the quality of teaching and learning in each curriculum subject, as well as to assess compliance with requirements relating to instruction time or learning outcomes. However, this sub-indicator goes beyond a simple requirement for a subject-based evaluation of ICT. Instead, it focuses on whether there are wider evaluation criteria relating to the integration of digital technologies across the whole school. The criteria include the use of digital technologies across the curriculum and in school management processes, as well as the quality of digital infrastructure and the level of investment.

5.5.1. Appointment of school digital coordinators

Figure 5 shows that only 11 education systems have established a top-level requirement to appoint a digital coordinator at school (only in lower secondary education in Cyprus). This position is often held by a teacher who receives a reduction of teaching hours to provide technical and other support to the school community.

For instance, in the **Flemish Community of Belgium**, the government funds a specific ICT-coordination time by earmarking hours within the total amount of human-resource provisions for schools. The amount of resources for ICT-coordination largely depends on

school size (the number of pupils). The ICT coordinator supports the team and the school management in taking appropriate measures with regard to ICT integration ([40]).

In **Austria**, there is an educational IT coordinator (*IT-Kustodiat*) at each school. They are responsible for the pedagogical support of the use of IT. The federal government pays for this work (reduction of teaching hours). In addition, there are coordinators for the technical support of IT. This task is the responsibility of the school owners. The federal government has developed a three-pillar model for IT support for its schools and has been implementing this model in all federal schools since 2015.

In another 16 systems, this matter is subject to school/local autonomy. In some cases, countries report that while there is no top-level requirement, in practice a digital coordinator is appointed in most schools.

For instance, in the **French Community of Belgium** the nomination of an ICT coordinator (*délégué(e) référent(e) numérique*) is a decision taken by the school head. The government decree gives autonomy to the school heads to assign this task to a teacher whose teaching time is consequently reduced.

In **Estonia**, most schools have an IT manager (in case of small schools, the IT manager can be employed by the local government authorities and be in charge of several schools) and/or an educational technologist. While the IT manager is responsible for the IT infrastructure, the educational technologist coordinates digital learning, supports the introduction of innovative solutions and advises teachers and learners in the use of digital tools and opportunities in the learning process.

In **Ireland**, most larger schools tend to appoint a digital coordinator. However, this may not typically be the case in the smaller schools at primary ISCED level 1. Often at ISCED level 1, the appointment of a digital coordinator may be on a voluntary basis or part of the additional responsibilities of a member of the middle-management team who happens to have a particular interest and expertise in digital technology.

In the remaining 11 systems no top-level requirement to appoint a digital coordinator at school exists, and the education authorities do not provide further information.

5.5.2. Top-level requirement to have a school digital plan

Concerning the establishment of a school digital plan, this is a top-level requirement in only nine systems (with four of them opting for a specific digital plan and five noting that it can be part of the general school-development plan).

In **Ireland**, each school must have a Digital Learning Plan, based on a whole school approach and taking into account its context and circumstances. The plan outlines the vision of the school for the embedding of digital technologies in teaching, learning and assessment and incorporate targets and priorities for improvement and development. Schools are advised to review and update the digital learning plan at least annually. This plan guides the use of grant funding to embed digital technologies in a phased and coherent approach to improve learning outcomes for students ([41]).

In **Portugal**, all schools are invited to develop action plans for digital development, which integrate actions in three areas: organisation, pedagogy, and technology and digital. These action plans are conceived, developed and monitored by digital development teams in each school and are supported by digital ambassadors at the teacher training centre at national level ([42]).

In a further 12 systems the creating of such a plan is subject to school/local autonomy. In many cases, although a digital school plan is not compulsory, schools are encouraged to develop such plans and receive support in this endeavour.

In the **French Community of Belgium**, schools are encouraged to create a management plan (steering plan) with a focus on three to five specific goals for improvement, which could include digital aspects of learning. Digital aspects can also be inserted as transversal points in various specific goals. More specifically, a school is encouraged to insert digital tools both in learning and in

([40]) https://data-onderwijs.vlaanderen.be/edulex/document/13401

([41]) The Grant Scheme for ICT Infrastructure for the 2021/2022 school year is outlined in the Department of Education Circular available at https://www.gov.ie/en/circular/e1f8e-grant-scheme-for-ict-infrastructure-20212022-school-year/#:~:text=The%20new%20Digital%20Strategy%20for,National%20Development%20Plan%202021%2D2030.

([42]) https://digital.dge.mec.pt/desenvolvimento-digital-das-escolas

school governance and to acquire digital equipment. The development of a specific digital strategy is therefore not mandatory, and actions can be developed in a transversal way through the management plan (steering plan).

Similarly in the **Flemish Community of Belgium**, although not mandatory, schools are encouraged and supported to develop such a plan. The Knowledge Centre for Digital Education, for example, supports schools by providing training and policy-planning tools.

In **Estonia**, schools are required to have a development plan that is drawn up for at least three years and sets the goals and main directions of the school's development. Some schools include their digital development goals in the general development plan; the others have a separate digital development plan (coordinated by the educational technologist).

Finally, the remaining 17 systems do not require the establishment of a school digital plan and do not have further information on school practices in this regard.

However, although there is no top-level requirement in **Germany**, when school authorities apply for funding from the DigitalPakt Schule of the Federation and the Länder, they need to submit a technical and pedagogical concept, which includes media education concepts, a technical concept and a further training concept. These concepts ensure the pedagogical use of digital technologies and the qualification of teachers. Most schools have developed or are in the process of developing school digital plans (*Medienentwicklungspläne*) ([43]).

5.5.3. Criteria relating to digital education included in external school evaluation

Finally, it is not very common for criteria related to digital education to be included in external school evaluations. Nevertheless, 16 education systems (only lower secondary education in Ireland) report that such criteria exist, either specifically for digital competences or as a part of wider areas. Some examples that can serve as an illustration of different approaches are given below.

In **Estonia**, one of the 13 performance indicators that are considered in external school evaluations is the frequency of the use of digital solutions in teaching and educational activities, which is monitored in eighth grade.

In **Ireland**, for ISCED level 24, during whole school evaluations inspectors use specific criteria relating to digital education as outlined in the Digital Learning Framework for Post-Primary schools (DLFPP) ([44]).

In **Serbia**, external school evaluations do not explicitly include indicators relating to digital education. On the other hand, in some areas of quality assurance such as 'Organization of school work, management of human and material resources', certain indicators implicitly define criteria that are relevant for digital education, such as 'The school head creates conditions for continuous monitoring and evaluation of digital maturity of school' ([45]).

In 17 education systems no criteria related to digital education are used in external school evaluation (only primary education in Ireland and lower secondary education in Cyprus). In seven systems, no external school evaluation exists (in Cyprus, this only applies to primary education).

When looking across the three sub-dimensions of this indicator, it becomes clear that top-level requirements for appointing digital school coordinators and establishing school digital plan are not common. Actions in these areas are often left to the discretion of school leaders, which implies that practices vary and not every school benefits from these activities. Similarly, specific criteria related to digital education in external school evaluation are not widespread either.

Overall, it appears that there is scope for more active top-level guidance and support on establishing a viable digital ecosystem at school.

([43]) https://www.digitalpaktschule.de/files/VV_DigitalPaktSchule_Web.pdf

([44]) https://www.pdsttechnologyineducation.ie/en/Planning/Digital-Learning-Framework-and-Planning-Resources-Post-Primary/Digital-Learning-Framework-for-Post-Primary-Schools.pdf

([45]) Bylaw on the quality evaluation of institutions: https://www.paragraf.rs/propisi/pravilnik-standardima-kvaliteta-rada-ustanove.html

Figure 5: Digital education ecosystem at school, 2021/2022

	Top-level requirement to appoint a digital coordinator at school	Top-level requirement to have a school digital plan	Criteria relating to digital education in external school evaluation	
			ISCED 1	ISCED 24
Belgium BE fr	■	■	○	○
Belgium BE de	■	■	○	○
Belgium BE nl	●	■	●	●
Bulgaria	■		◊	◊
Czechia	■		●	●
Denmark	■	■	○	○
Germany			●	●
Estonia	■	■	●	●
Ireland	■	●	○	●
Greece			○	○
Spain	●	○	●	●
France	●	●	●	●
Croatia			○	○
Italy	●	●	○	○
Cyprus	●	■	◊	○
Latvia	■	○	○	○
Lithuania	■	○	●	●
Luxembourg	●	○	◊	◊
Hungary		■	●	●
Malta	●	■	●	●
Netherlands	■		○	○
Austria	●	○	◊	◊
Poland	■		●	●
Portugal	■	●	○	○
Romania	■	■	●	●
Slovenia	●		○	○
Slovakia			○	○
Finland	■	■	◊	◊
Sweden	■	■	●	●
Albania			○	○
Bosnia and Herzegovina			○	○
Iceland			○	○
Liechtenstein			●	●
Montenegro	●		○	○
North Macedonia			●	●
Norway	■	■	◊	◊
Serbia			●	●
Türkiye	●		◊	◊

Top-level requirement to appoint a digital coordinator at school	Top-level requirement to have a school digital plan	Criteria relating to digital education in external school evaluation
● Yes	● Specific digital plan	● Criteria relating to digital education exist
	○ As part of the school development plan	○ No criteria exist
■ School/local autonomy **and/or** No top-level requirement (1)	■ School/local autonomy	◊ There is no external school evaluation

(1) but in practice a digital coordinator is appointed in most schools

5.6. Main findings

This analysis reviews the situation of the 2021–2022 school year regarding key structures and policies that support the teaching of digital competence at school in Europe, based on information from 38 European education systems. Several main findings can be underlined.

- In the majority of European education systems, the compulsory teaching of digital competence for all pupils starts in primary education (ISCED level 1). In 18 systems this is done as early as the first grade of primary education, and in another seven systems this happens several grades later. The latest compulsory starting grade that has been reported is seventh grade in lower secondary education (ISCED level 24) – this concerns the current situation in Cyprus and Malta. On the other hand, the top-level education authorities in the three Communities of Belgium, Germany, Ireland, the Netherlands, Slovenia, Iceland and Norway have not established a compulsory starting grade for the teaching of digital competences for all students.
- Across Europe, digital competences are taught using several curricular approaches that may be applied in parallel or alternated depending on the education level. Overall, in primary education, the most common approach is to teach digital competences as a cross-curricular subject, while in lower secondary education teaching is most often done as a compulsory separate subject.
- The great majority of European systems have included explicit learning outcomes in all areas of digital competence. Overall, across the five competence areas, learning outcomes are most frequently cited for 'Evaluating data, information and digital content', while relatively less outcomes exist for 'Creatively using digital technologies'. No or almost no learning outcomes in any of the domains for both primary and lower secondary education were reported in the French and German-speaking Communities of Belgium, Ireland, the Netherlands and Slovenia. This is often linked to the fact that in these systems digital competences are not taught as part of the compulsory curriculum for all students. As a result, specific learning outcomes may exist only in optional subjects. Another significant point is that Germany, Croatia and Romania reported learning outcomes relating only to lower secondary education.
- In about half of all education systems, top-level authorities require that teacher-specific digital competences be included in ITE curricula. In the rest of the European education systems, there are no such top-level requirements. In many of these cases, the providers of initial teacher education have institutional autonomy regarding the content of the courses they offer. However, the absence of top-level requirement does not necessarily mean that ITE institutions do not offer teachers the opportunity to develop digital competences.
- The assessment of students' digital competences through national tests remains rare. Most often such national tests take place in lower secondary education. In more than half of all education systems full cohort national tests do not include digital competences or no national tests in any competence are organised.
- Specific measures for the establishment of a digital ecosystem in every school are not widely available. The appointment of school digital coordinators and the development of school digital plan are often left to the discretion of school heads, which means that in practice not all schools and students can benefit from better planning and the development of new digital learning. Similarly, specific criteria relating to digital education in external school evaluations exist in only 16 European systems.
- Most of these findings are in line with the conclusions of the 2019 Eurydice report *Digital Education at School in Europe*, and no major policy shifts have been observed in the past few years. Overall, it appears that there is ample scope for more active top-level guidance and support to improve teachers' preparedness, develop student assessment through national tests and establish viable digital ecosystems at school.

6. SCOPE OF INDICATORS / KEY DEFINITIONS

6.1. Early childhood education and care

Guarantee of a place

This table shows the starting age of the universal legal entitlement to an ECEC place, compulsory ECEC and compulsory primary education.

Compulsory ECEC refers to the obligation for children to attend ECEC settings when they reach a certain age.

Legal entitlement to ECEC refers to a statutory duty on ECEC providers to secure publicly subsidised ECEC provision for all children living in a catchment area whose parents, regardless of their employment, socioeconomic or family status, require a place for their child.

It is important to note that a 'right to ECEC for every child' expressed in legislation in general terms, but without adequate funding and the necessary policies to ensure the delivery of sufficient places, is not considered a legal entitlement. Similarly, the existence of some publicly subsidised ECEC settings providing places for limited numbers of children is not considered a legal entitlement if public authorities are not obliged to provide a place. A legal entitlement to ECEC exists when every child has an enforceable right to benefit from ECEC provision. An enforceable right means that public authorities guarantee a place for each child whose parents request it (in the age-range covered by the legal entitlement), regardless of their employment, socioeconomic or family status. It does not necessarily imply that provision is free, only that it is publicly subsidised and affordable.

A targeted legal entitlement or targeted compulsory ECEC that applies only to certain groups of children (e.g. disadvantaged learners, children of parents who are in employment, certain minorities, etc.) are not considered in this publication.

Professionalisation of ECEC staff

Here, **'ECEC staff'** refers only to those professionals who have regular, daily, direct contact with children and whose duties involve education and care. These staff members bear the main responsibility for groups of children in an ECEC setting. Their duties usually include designing and delivering safe and developmentally appropriate activities in accordance with all relevant programmes/curricula.

The term ECEC staff does not include heads of ECEC settings, medical/healthcare staff (such as paediatricians, physiotherapists, psychomotor therapists, nutritionists, etc. providing support for children's physical development), professional specialists (such as psychologists), assistants / auxiliary staff members who only perform domestic or maintenance roles (such as preparing food and cleaning premises).

Indicator 1.2.1 on the requirement for at least one staff member per group of children in ECEC to have a minimum of Bachelor-level qualification in the field of education (i.e. a minimum of 3 years at ISCED level 6 according to the ISCED 2011 classification) aims to show whether education staff in the sector are highly qualified. This is important, as staff who are highly qualified in education can provide leadership to other team members when designing and delivering developmentally appropriate activities for children and thus raise the quality of provision.

Programmes at **ISCED level 6 (i.e. Bachelor's degree or equivalent level)**, are often designed to provide participants with academic and/or professional knowledge, skills and competencies, leading to a first degree or equivalent qualification. Programmes at this level are typically theoretically based but may include practical components and are informed by state-of-the-art research and/or best professional practice. They are traditionally offered by universities and equivalent tertiary educational institutions, but do not necessarily involve the completion of a research project or thesis ([46]).

Indicator 1.2.2 presents the basic requirements regarding the **continuing professional development** (CPD). CPD consists of the formal in-service training undertaken throughout a career that allows ECEC staff members to broaden, develop and update their knowledge, skills and attitudes. It includes both subject-based and pedagogical training. Different formats are offered, such as courses, seminars, peer observation and support from practitioners' networks. In certain cases, CPD activities may lead to supplementary qualifications.

Professional duty: CPD is considered to be one of ECEC staff's professional duties according to regulations and other relevant policy documents.

Curriculum or educational guidelines

This indicator shows whether countries have an ECEC curriculum or educational guidelines for the entire ECEC phase or only for the children aged 3 and over.

The **ECEC curriculum** as defined in the ECEC quality framework covers developmental care, formative interactions, learning experiences and supportive assessment. It promotes young children's personal and social development and their learning as well as laying the foundations for their future life and citizenship in their society. The ECEC curriculum is set out in formal documentation issued by the responsible authorities.

The learning opportunities to be provided to young children can also be communicated through official **educational guidelines** which explain the content and teaching approaches incorporated into legislation as part of, for example, an ECEC education programme or reference framework. The guidelines often refer to skills, educational standards, curriculum criteria or care/education plans; they may also offer practical advice for ECEC practitioners.

6.2. Achievement in basic skills

Nationally standardised tests in literacy, mathematics and science

This indicator examines the extent to which the three basic skills are assessed in national tests during compulsory education.

National testing is defined as 'the national administration of standardised tests and centrally set examinations'. These tests are standardised by the national education authorities or, in the case of Belgium, Germany, Spain and the United Kingdom, by the top-level authorities for education. The procedures for the administration and marking of tests, as well as the setting of content and the interpretation and use of results are decided at central level. National testing is carried out under the authority of a national or centralised body and all examinees take the tests under similar conditions.

This indicator includes national testing for both summative and formative purposes. Both compulsory and optional tests are considered, as are sample-based national tests.

([46]) http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf

Recent national reports on achievement in basic skills

This indicator relates to national reports on performance trends, factors contributing to underachievement, and effective approaches for raising attainment in the basic skills. These reports are based on national data and/or results of international surveys such as PISA, TIMSS and PIRLS and have been published since 2015.

Use of student performance data in external school evaluation

This indicator looks at whether student performance data is used as a source of information in external school evaluation.

The **external evaluation of schools** is conducted by evaluators who report to a local, regional or central/top-level education authority; they are not directly involved in the activities of the school under evaluation. This type of evaluation covers a broad range of school activities, including teaching, learning and/or all aspects of school management.

The **student performance data** used in external school evaluation may include students' results in centrally set examinations and nationally standardised assessments. Also used are student results in teacher assessments; data on student progression through school; student results in international surveys; and, although less frequently, outcomes in the job market and student or parent satisfaction.

Central guidelines on addressing student underachievement in initial teacher education (ITE)

This indicator shows whether there are any central-level regulations, recommendations or guidelines for ITE programmes regarding the competences needed to address underachievement in basic skills or whether higher education institutions have full autonomy with regard to the content of ITE programmes.

Additional support for schools enrolling large numbers of disadvantaged students

This indicator examines whether central education authorities allocate additional resources to schools that enrol large numbers of disadvantaged students. **Additional support to schools** refers to nationally allocated financial and/or other resources that would otherwise require additional funding (extra educational staff, special allowances, professional development opportunities, reduced teaching time, scholarships, career advice services, etc.). The central education authorities can allocate these resources at the regional, local or school level directly.

Disadvantaged students (from at-risk or vulnerable groups) are defined at national level. Possible criteria are socioeconomic status, ethnic origin and having a migrant background, along with other criteria depending on the national context.

Socioeconomic status refers to a combined economic and sociological measure of an individual's or their family's economic and social position relative to others, based on income, education and occupation. Parents' educational attainment is often taken as a proxy measure for socioeconomic status.

6.3. Early leaving from education and training

In this analysis, **early leaving from education and training (ELET)** refers to students leaving education and training before completing the upper secondary level and obtaining a corresponding school-leaving certificate. This broad definition encompasses the young people who, according to their own country's definition, are considered to be early leavers. It includes, for example, young people who leave (or drop out of) school without completing what is considered in the national context as basic education (usually primary and lower secondary education).

Collecting national data on based on a student register

This indicator examines the existence of a national data collection system on ELET to assess the scale of the problem. ELET data from student registers is collected automatically from school administration systems based on students' personal data. This can be used to determine the number of early leavers by comparing records from one school year to the next. It can also be useful when evaluating the effectiveness of policies to reduce early leaving. Student-register-based data can finally also be employed to monitor absenteeism, thereby acting as a warning system to alert schools and authorities that they may need to intervene to help students at risk of leaving early.

Increasing the flexibility and permeability of education pathways

This indicator focuses on policy initiatives aimed at minimising the risk of early leaving by offering students a wider choice of programmes or alternative pathways (academic, technical or vocational) and providing them with opportunities to change paths or programmes when these do not meet their needs. The indicator also covers policies that are designed to ensure a smooth transition between education levels and programmes (especially from general education to vocational education and training programmes). It also includes policies that aim to improve the recognition of skills and qualifications, thereby helping students to progress to the next level or to re-engage in education or training if they have left the system prematurely.

Providing language support for students with a different mother tongue

This indicator covers language-support policies for students with a mother tongue that is different from the language of instruction. Empirically, young people from migrant backgrounds tend to be over-represented among those leaving education and training early in many European countries ([47]). Language-support policies can help ensure the provision of measures to strengthen the students' competences in the language of instruction, which are crucial in order to benefit from learning opportunities and avoid falling behind.

Addressing ELET in initial teacher education and continuing professional development

This indicator examines policies and measures for improving teachers' understanding of the challenge of early leaving through initial teacher education (ITE) and continuing professional development (CPD). This implies increasing teachers' awareness of the underlying causes, the main triggers and early warning signs and strengthening their capacity to take action in both preventing early leaving and supporting students who are at risk. Training on ELET may also provide teachers with an opportunity to engage in peer learning and collaborate with other teachers and schools with experience in this area.

([47]) Eurostat (EU-LFS) [edat_lfse_02]

Offering education and career guidance in schools

This indicator analyses policies on education and career guidance, which is provided both as a compulsory part of the curriculum and by school guidance services in lower and upper secondary education. Education and career guidance provides students with information and support in developing decision-making and other skills which are important for managing their educational and/or career choices. Guidance may also include psychosocial work or counselling to help students, in particular those at risk of leaving early, as they progress through education and training.

Providing support for early leavers to re-enter the education and training system

This indicator presents policies and measures that help young people who have left education and training early to re-enter the system. This may entail: policies promoting the provision of second-chance education, i.e. alternative education and training pathways leading to a formal qualification; education and career guidance, which may be combined with practical skills training, one-to-one or group counselling, or similar support offered to help young people develop a vision for their careers and lives; and initiatives taking place within the context of the 'Youth Guarantee' ([48]), which seeks to ensure that all young people under 25 get a good quality, definite offer within 4 months of leaving formal education or becoming unemployed for a job, apprenticeship, traineeship or continued education that is adapted to each individual's needs and situation.

6.4. Higher education

Quantitative targets relating to the social dimension of higher education

This indicator examines countries' attempts to widen participation in higher education through quantitative targets for under-represented groups of students. It encompasses quantitative targets which focus on widening or increasing participation among the groups currently under-represented in higher education. However, equity in treatment is also important, so targets related to improving completion rates (attainment) for these groups are also considered here. Examples of under-represented groups might include people with disabilities, migrants, ethnic groups, lower socioeconomic status groups, women/men, etc.

Monitoring of the socioeconomic characteristics of the student body

For this indicator, **systematic monitoring** refers to the process of systematic gathering, analysis and use of data to inform policy. It aims to capture how the higher education system operates and whether it is reaching its objectives and targets. It can take place at various stages: upon entry to higher education, during studies (i.e. student retention), at graduation (i.e. completion rates) and after graduation (i.e. graduate 'destinations' – employment or further study). Systematic monitoring must include mechanisms for cross-institutional data gathering and allow cross-institutional data comparability.

This indicator focuses on the systematic monitoring of the **socioeconomic status of students**, defined as a combined measure of students' or their families' economic and social position relative to others, based on income, education and occupation. When analysing a family's socioeconomic status, the household income (combined and individual) is examined, along with the education and

([48]) Council Recommendation of 22 April 2013 on establishing a Youth Guarantee. OJ C 120, 26.4.2013 (http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32013H0426(01)).

occupation of earners. Parents' educational attainment is often taken as a proxy measure for socioeconomic status.

Recognition of informal and non-formal learning on entry to higher education

This indicator focuses on prior informal and non-formal learning.

Informal learning means learning resulting from daily activities related to work, family or leisure and which is not organised or structured in terms of objectives, time or learning support; it may be unintentional from the learner's perspective. Examples of informal learning outcomes are skills acquired through life and work experiences such as project management or ICT skills acquired at work; languages learned and intercultural skills acquired during a stay in another country; ICT skills acquired outside work; skills acquired through volunteering, cultural activities, sports and youth work; and skills acquired through home-based activities (e.g. taking care of a child).

Non-formal learning means learning which takes place through planned activities (in terms of learning objectives and learning time), where some form of learning support is present (e.g. from a tutor). It may cover programmes to deliver work skills, adult literacy and basic education for early school leavers. Very common examples of non-formal learning include in-company training, through which companies update and improve the skills of their workers such as ICT skills, structured online learning (e.g. by making use of open educational resources) and courses organised by civil-society organisations for their members, their target groups or the general public.

Completion rates as a requirement in external quality assurance

This indicator focuses on the use of completion rates as one of the criteria included in external quality assurance procedures for higher education institutions/programmes. Where the monitoring of completion rates is a requirement, it gives a good indication that they are measured in practice and that the information is likely to be used in policymaking. The completion rate indicates the percentage of students who complete the higher education programme they have started.

Performance-based funding mechanisms with a social dimension focus

Performance-based funding mechanisms with a **social dimension focus** enable funding to be provided to higher education institutions if they meet a defined level of performance in relation to social objectives. The performance may refer to people – staff or students – with defined characteristics in terms of socioeconomic status, ethnicity, disability, age, gender, migrant status, etc.

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GLOSSARY

Curricula: The official programmes of study issued for schools by top-level education authorities. The national curriculum may include learning content, learning objectives, attainment targets, syllabuses, or assessment guidelines, and it may be published in any type or any number of official documents. In some countries, the national curriculum is contained in legal decrees. More than one type of curriculum document may contain provisions relating to digital competence and these may impose different levels of obligation on schools to comply. They may, for example, contain advice, recommendations, or regulations. However, whatever the level of obligation, they all establish the basic framework in which schools develop their own teaching to meet their pupils' needs.

Digital competence: Digital competence involves the confident, critical, and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking. (Council Recommendation on Key Competences for Lifelong Learning, 2018, p. 9)
https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.C_.2018.189.01.0001.01.ENG&toc=OJ:C:2018:189:TOC

Digital education: Broadly speaking, digital education comprises two different but complementary perspectives: the development of digital competence of pupils/students and teachers; and the pedagogical use of digital technologies to support and enhance learning, teaching and assessment. In the European Commission 2018 Digital Education Action Plan this is phrased as 'how education and training systems can make better use of innovation and digital technology and support the development of relevant digital competences needed for life and work in an age of rapid digital change.'

Top-level authority: The highest level of authority with responsibility for education in each country, usually located at national (state) level. However, for Belgium, Germany, and Spain, the Communautés, Länder, and Comunidades Autónomas respectively are either wholly responsible or share responsibilities with the state level for all or most areas relating to education. Therefore, these administrations are considered as the top-level authority for the areas where they hold the responsibility, while for those areas for which they share the responsibility with the national (state) level, both are considered to be top-level authorities.

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Structural indicators for monitoring education and training systems in Europe – 2022: Overview of major reforms since 2015

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