European Commission

# Scenarios for the future of school education in the EU

## A Foresight Study

European Education Area

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## A Foresight Study

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# Executive Summary

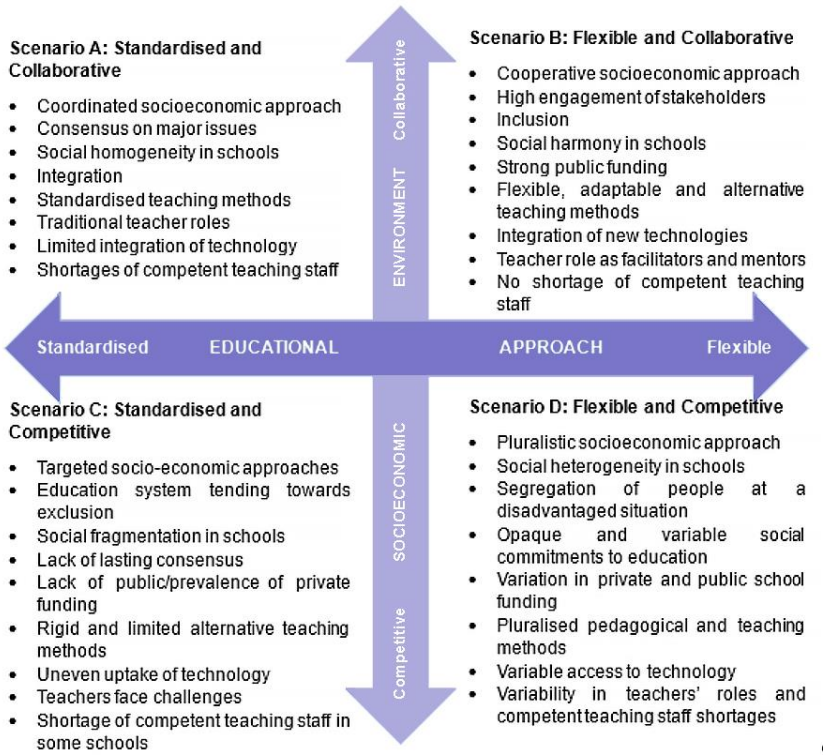
The foresight study focused on school education (ISCED levels 1-3) in the EU. It aimed at:

- developing four scenarios, describing potential alternative futures of the school education in the EU by 2040.
- identifying the preferred scenario developments.
- providing recommendations on the policy measures that could be introduced, or strengthened, to help school education in the EU move towards the preferred future scenario.

The development of the scenarios was based on the factors of change[1], identified through desk research, horizon scanning, and extensive stakeholder involvement. More than 80 European Commission officials, school education experts, representatives of teacher, student and headmaster umbrella organisations, and other stakeholders, from across the EU, contributed to the study, by participating in four workshops, a Delphi survey, and interviews.

The developed scenarios represent the intersections of the two axes. The educational approach axis focuses on "what", "how", and "where" teaching and learning happens with the extreme values varying from "standardised" to "flexible". The socio-economic environment axis focuses on overall social and economic conditions with the extreme values varying from "competitive" to "collaborative". The summary characteristics of each developed scenario are presented in Figure 1 below.

**Figure 1. Four scenarios of school education by 2040 and their summary characteristics**




*Source:* Own elaboration

[1] Factors of change – any change with influence on the system being studied that might unfold into different directions in the future.

In addition, each scenario includes a wild card[2] that can take one of the following four forms: A) major technological disruption; B) environmental crisis, caused by climate change; C) deep economic crisis in the EU; D) crisis of public school system.

Based on multi-stakeholder consultations, the preferred future of the school education in the EU by 2040 is mostly depicted in the scenario B, "Flexible and Collaborative".

The analysis of current European Commission's policies revealed that the majority of currently implemented or planned EU-level measures are aligning school education in the EU with the preferred scenario developments. However, some existing policy measures should be strengthened, or new ones introduced, to help school education in the EU reach the preferred state by 2040. In particular, it is recommended that the European Commission, Member States, and other school education stakeholders:

### *Education funding*

**Figure 2. Recommendations related to education funding**

| Recommendation | Intended recipient |
|---|---|
| Maintain or further increase financing for the Erasmus+ programme | EU |
| Continue to provide funding for education reforms in Member States | EU |
| Continue promoting effective and targeted investments of Member States and their robust evaluation | Commission |
| Ensure effective and targeted investments of EU funds for implementing education reforms at national-level and their robust evaluation | Member States |

*Source:* Own elaboration

### *Inclusion of learners in a disadvantaged situation*

**Figure 3. Recommendations related to inclusion of learners in a disadvantaged situation**

| Recommendation | Intended recipient |
|---|---|
| Increase funding and intensify their efforts in research focused on identifying and understanding the effects of policy measures aimed at reducing educational inequity | Commission, Member States, academic community |
| Continuously monitor progress towards reducing the education achievement gap of students impacted by different factors known to cause underachievement | Commission, Member States |
| Continuously collect national-level data on indicators monitoring the reduction of the education achievement gap needed for monitoring it at EU-level | Member States |
| Establish and contribute to the establishment of the European framework for diversity and inclusion | Commission, Member States, student, teacher, school leader umbrella organisations, school and academic communities, other school education stakeholders |
| Ensure that inclusion and equity are embedded as the cross-cutting principles in all upcoming EU-level school education policy initiatives | Commission |
| Ensure that, where relevant, inclusion and equity are embedded as the cross-cutting principles in all upcoming national-level school education policy initiatives | Member States |

*Source:* Own elaboration

[2] Wild cards – surprising and rare events that might constitute turning points in the evolution of a certain system. Extremely low probability, dramatic impact.

### *Degree of digitalisation and existing/planned regulation*

**Figure 4. Recommendations related to digital skills shortages**

| Recommendation | Intended recipient |
|---|---|
| Monitor the SELFIE and SELFIE for TEACHERS user feedback to identify and remove barriers to their wider uptake and further enhance user experience | Commission |
| Develop a repository of learning materials or link existing EU-level and Member States-level repositories to different SELFIE areas and SELFIE for TEACHERS competence areas | Commission, Member States |
| Ensure, where relevant and feasible, availability of the above learning materials in the national language | Member States |
| Ensure increasing and balanced across the Member States uptake of the digital learning and experience exchange platforms and self-assessment tools | Commission, Member States |
| Facilitate development and access to high-quality digital education content across the EU to be included in the existing, or newly established, repositories of learning materials | Commission, Member States, school and academic communities, Ed Tech companies, other school education stakeholders |
| Open anonymised SELFIE and SELFIE for TEACHERS user data to researchers | Commission |
| Use the anonymised SELFIE and SELFIE for TEACHERS user data for in-depth analysis of the school digital preparedness and teacher digital competences | Academic community |

*Source:* Own elaboration

### *Well-being in digital education*

**Figure 5. Recommendations related to well-being in digital education**

| Recommendation | Intended recipient |
|---|---|
| Develop and participate in the development of comprehensive guidelines for educators, focusing on the identification and mitigation of social risks, and the promotion of well-being in digital education | Commission, Member States, student, teacher school leader umbrella organisations, school and academic communities, other school education stakeholders |
| Introduce and contribute to introducing self-assessment tools, allowing for evaluation of how effectively schools are addressing digital well-being issues and digital education social risks | Commission, academic community, student, teacher, school leader and teacher educator umbrella organisations |

*Source:* Own elaboration

### *School internet connectivity*

**Figure 6. Recommendations related to school internet connectivity**

| Recommendation | Intended recipient |
|---|---|
| Monitor and encourage/ensure the achievement of the target of being connected to gigabit internet by 2025 for all schools | Commission, Member States |

*Source:* Own elaboration

## *Pedagogical and teaching methods*

**Figure 7. Recommendations related to pedagogical and teaching methods**

| Recommendation | Intended recipient |
|---|---|
| Conduct in-depth analysis and provide information on the projects recognised through the European Innovative Teaching Award, identifying their success factors and transferable practices | Commission, Member States, academic community, school communities receiving the award |
| Based on the results of the above analysis, produce and contribute to producing methodological guidance for the school community on choosing and applying more flexible, and innovative pedagogical and teaching methods | Commission, Member States, student, teacher, school leader umbrella organisations, school and academic communities, other school education stakeholders |
| Develop and participate in the development of recommendations or guidelines for Member States to ensure that student-centred, flexible, and innovative pedagogical and teaching methods are embedded in initial teacher education (ITE), as well as continuous professional development (CPD) programmes | Commission, Member States, student, teacher, school leader umbrella organisations, academic community |
| Embed student-centred, flexible, and innovative pedagogical and teaching methods in the ITE, as well as CPD programmes | Member States, teacher educators, national teacher educator umbrella organisations |
| Develop and participate in the development of recommendations or guidelines for Member States to ensure that teachers have sufficient autonomy, time, and level of relevant competences to try out and adapt innovative and flexible pedagogical and teaching methods | Commission, Member States, student, teacher, school leader umbrella organisations, school and academic communities |
| Ensure that teachers have sufficient autonomy, time, and level of relevant competences to try out and adapt innovative and flexible pedagogical and teaching methods | Member States, teacher educators, national teacher educator umbrella organisations |
| Ensure that school leader and teacher standards, competence frameworks, and/or professional profiles reflect the skills needed to facilitate effective adoption of the student-centred, flexible and innovative pedagogical and teaching methods | Member States |

*Source:* Own elaboration

## *Personalised and blended learning*

**Figure 8. Recommendations related to personalised and blended learning**

| Recommendation | Intended recipient |
|---|---|
| Continue to promote an EU approach to blended learning, emphasising its role in supporting quality and flexible, adaptive, and inclusive education | Commission |
| Ensure that schools have sufficient financial resources to support personalised and blended learning design, implementation, and evaluation | Member States |
| Ensure that school leaders and teachers have the time and flexibility to innovate with personalised and blended learning approaches | Member States |
| Ensure that school leader and teacher standards, competence frameworks, and/or professional profiles reflect the skills needed to facilitate effective personalised and blended learning | Member States |
| Encourage and create incentives and opportunities for personalised and blended learning related professional learning for school leaders and teachers | Member States |

*Source:* Own elaboration based on the work of the Working Group on Schools

### *Assessment methods*

**Figure 9. Recommendations related to assessment methods**

| Recommendation | Intended recipient |
|---|---|
| Follow the conclusions of the "Prospective report on the future of assessment in primary and secondary education" and the work of the Working Group on Schools to provide recommendations and guidance for Member States (focusing on teachers and schools) on introducing innovative types of assessment in school education | Commission, Member States, student, teacher, school leader umbrella organisations, school and academic communities, other school education stakeholders |
| Support and participate in good practice exchange and peer learning focusing on innovative assessment types | Commission, Member States |
| Fund projects focusing on developing modules on innovative assessment methods | Commission, other school education stakeholders, submitting projects to Erasmus+ Teacher academies |

*Source:* Own elaboration

### *Teacher role, competences and working conditions*

**Figure 10. Recommendations related to teacher role, competences, and working conditions**

| Recommendation | Intended recipient |
|---|---|
| Recognise the changing teacher roles, worsening working conditions, and increasing shortages as the key school education concern | Commission, Member States |
| Launch and take part in a strategic dialogue within the existing structures with Member States and school education stakeholders on the above-mentioned issues with an aim to develop a long-term, comprehensive plan for tackling them | Commission, Member States, student, teacher, school leader umbrella organisations, school and academic communities |

*Source:* Own elaboration

### *Teacher ITE and CPD*

**Figure 11. Recommendations related to teacher ITE and CPD**

| Recommendation | Intended recipient |
|---|---|
| Research the content and uptake of ITE and CPD across the EU | Commission, Member States, academic community |
| Launch and take part in a strategic dialogue within the existing structures with Member States and education stakeholders on the contents and uptake of ITE and CPD across the EU | Commission, Member States, student, teacher, school leader umbrella organisations, school and academic communities, other school education stakeholders |

*Source:* Own elaboration

### *AI adoption*

**Figure 12. Recommendations related to AI adoption**

| Recommendation | Intended recipient |
|---|---|
| Fund projects to develop training modules on commonly used AI systems in education, covering their features, limitations, and application possibilities | Commission, other school education stakeholders, submitting projects to Erasmus+ Teacher academies |
| Utilise existing initiatives and, if there is a justified need, establish new opportunities for the exchange of good practices and international peer learning about AI adoption | Commission, Member States |

*Source:* Own elaboration

### *Interdisciplinary learning*

**Figure 13. Recommendations related to interdisciplinary learning**

| Recommendation | Intended recipient |
|---|---|
| Monitor the extent of interdisciplinary education across the EU by including related questions in existing EU-wide school education surveys or launching new dedicated surveys | Commission, Member States, other international organisations (e.g. OECD) |
| Ensure the provision of more ready-made materials for schools promoting integrated content knowledge and skill development | Commission, Member States |
| Fund projects highlighting and making use of intersections between different subjects (e.g. sustainability/civic education and digital education) | Commission, other school education stakeholders, submitting projects to Erasmus+ Teacher academies |
| Facilitate and participate in peer learning and good practice sharing on interdisciplinary learning | Commission, Member States |
| Ensure that teachers have sufficient autonomy, time, and level of relevant competences to try out and adapt interdisciplinary learning | Member States |
| Ensure that school leader and teacher standards, competence frameworks, and/or professional profiles reflect the range of skills needed to facilitate effective adoption of interdisciplinary learning | Member States |

*Source:* Own elaboration

### *Sustainability and civic and citizenship education*

**Figure 14. Recommendations related to sustainability and civic and citizenship education**

| Recommendation | Intended recipient |
|---|---|
| Develop and participate in the development of self-assessment tools to assess current status of schools regarding sustainability and civic and citizenship education | Commission, school and academic communities, student, teacher, school leader umbrella organisations |
| Develop and participate in the development of self-assessment tools to allow educators to assess their sustainability, and civic and citizenship education competences | Commission, academic community, student, teacher, school leader and teacher educator umbrella organisations |
| Provide further support for teachers to develop sustainability education skills | Commission, Member States, other school education stakeholders, submitting projects to Erasmus+ Teacher academies |
| Promote and participate in the good practice exchange and peer learning on sustainable learning spaces | Commission, Member States, school communities |

*Source:* Own elaboration

### *Skill and competence development*

**Figure 15. Recommendations related to skill and competence development**

| Recommendation | Intended recipient |
|---|---|
| Produce and support producing of the guidelines for teachers and schools on tackling underachievement encompassing teaching practices, school curriculum structure, instruction time, and others | Commission, Member States, student, teacher school leader umbrella organisations, school and academic communities, other school education stakeholders |

*Source:* Own elaboration

# 1. Objectives and scope of the study

## 1.1. Objectives

- Map and describe the main elements of school education relevant to as many as possible school education systems within the EU-27 countries.
- Identify, anticipate, and describe the main factors of change (FoC) (including their importance and uncertainty) affecting school education in EU-27 via five categories: 1) megatrends, 2) general trends, 3) emerging trends, 4) weak signals, and 5) "wild cards" or "black swans".
- Engage identified EU-level stakeholders and experts to determine the current state of school education, the main FoC, and the subsequent critical uncertainties that will form the basis for the development of exploratory scenarios of the future of school education in the EU by 2040.
- Develop and validate four scenarios, which describe potential alternative futures of the state of school education in the EU by 2040 based on the combination of identified FoC and their potential impact on education.
- Analyse the scenarios, identify the preferred scenario developments and provide recommendations on the policy measures needed to be introduced/strengthened to ensure that school education in the EU is moving towards the preferred future scenario.

## 1.2. Time horizon

- **2022** is set as a baseline reference year, however, it is noted that there might be 2 to 3 year-long lag, due to the differences in available statistical data to be used.
- **2040** is set as the time-horizon to be used to allow for a period, which would span beyond a number of set strategic policies (such as European Education Area by 2025 (EEA), The Digital Education Action Plan 2021-2027 (DEAP), Erasmus+, and European Solidarity Corps programmes 2021-2027), and provide a long enough time horizon for potential political, economic, social, technological, legal, and environmental developments, likely to affect the future of school education in the EU.

## 1.3. Thematic scope

- The foresight activity looks into the non-vocational school education. The main focus of the study is on primary, lower secondary, and upper secondary, non-vocational, school education (ISCED levels 1-3). Other levels of education (vocational education and training (VET), higher education (HE), adult learning) are only considered if the developments in the respective levels have a significant effect on school education.

- The foresight activity considers different FoC organised in the five above-indicated categories. Each of the five categories can describe developments that are political, economic, social, technological, legal, or environmental, if they are relevant for school education.
- Specific attention is given to **demographic trends as an overarching factor** facilitating change in school education system.
- In identification of relevant FoC **essential topics**, as listed in the Request for Services (RfS), and **additional topics**, proposed by the exploratory interview respondents, related to developments in school education are considered.

  Essential topics:

  - Teachers and school governance;
  - Sustainability education;
  - Well-being in schools;
  - Equity, diversity and inclusion in education;
  - Digital education;
  - Civic and citizenship education.

  Additional topics:

  - Students;
  - Interdisciplinary education;
  - EU identity education;
  - Global education;
  - Education funding;
  - Lifelong learning;
  - Rethinking of the purpose of schools and their organisation.

## 1.4. Geographical scope

The main focus is on Europe as defined by EU-27 Member States (MS). Global-level and national trends are considered only in cases where they might have impact on the overall school education development in the EU.

# 2. Conceptualisation

Three interrelated tasks were implemented to achieve the required outcomes of the project:

- **Mapping.** It laid the ground for further scenario development by mapping out the main elements of the school education across the EU, describing its main characteristics (the starting point for scenario development), and carving out the key challenges and trends (factors of change) it is likely to face.

  To implement the scoping task, we relied on three methods:

  - Desk research
  - Exploratory interviews
  - Scoping focus group discussion

- **Scenario building (alternative scenario narratives).** Building on the results of scoping, it focused on the actual development of a set of scenarios and their narratives for the future of school education in the EU by 2040.

  To implement the scenario building task, we relied on six methods:

  - Horizon scanning
  - Future sheets development
  - Delphi survey
  - Scenario space setting focus group
  - Scenario validation workshop
  - Scenario drafting

- **Scenario analysis (scenario implications for the school education in the EU).** It aimed at contextualising the scenarios developed by revealing their implications for the school education in the EU.

  To implement the scenario analysis task, we relied on two methods:

  - Scenario analysis focus group
  - Scenario implication analysis

# 3. Mapping of the school education in the EU

Each foresight exercise must start with a mapping exercise. In this study, our focus is school education (covering ISCED levels 1-3) in the EU. To understand how this kind of school education might be impacted by the identified FoC, we first need to understand which actors and elements constitute school education in the EU and, second, how these might be influenced by the identified FoC.

School education systems differ significantly across the EU. For example, European Education and Culture Executive Agency (EACEA)[3] distinguishes between at least three different organisational models of primary and lower secondary (ISCED levels 1 and 2) education across the EU:

- **Single structure education**. From the beginning to the end of compulsory education, all students follow a common curriculum providing general education. In addition, there is no transition between primary and lower secondary education.
- **Common core curriculum provision**. After successfully completing primary education (ISCED level 1), all students progress to lower secondary level (ISCED level 2), where they follow the same general common core curriculum.
- **Differentiated lower secondary education**. After successfully completing primary education, students follow distinct education pathways or specific types of education, which start either at the beginning, or during, lower secondary education. At the end of their studies, they receive different certificates.

The Directorate of Evaluation, Forecasting, and Performance monitoring (DEPP) of the French Ministry of National Education, Youth, and Sports, and the Ministry of Higher Education and Research and Innovation[4] distinguishes between the following main types of education systems that regards primary and secondary education.

- **Single-structure systems** characterised by general education programmes followed by all students, which are provided in a single institution covering primary and lower secondary education.
- **Common core structures** characterised by a general education programme followed by all pupils, but provided in two separate institutions, one for primary and one for lower secondary education.
- **Early tracking systems** where pupils are oriented, from the end of primary education, towards general or vocational education programmes of varying content and duration.

Despite the above difference, we aim to develop exploratory scenarios based on a search for commonalities, rather than differences among the school education systems across the EU, and, thereby, aim to develop a generic high-level mapping of the main school education actors and elements across the EU.

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3 European Commission / EACEA / Eurydice (2022). The structure of the European education systems2022/2023. Schematic diagrams. Eurydice – Facts and Figures.

4 The Directorate of Evaluation, Forecasting and Performance monitoring (DEPP) of the French Ministry of National Education, Youth, and Sports, and the Ministry of Higher Education and Research and Innovation (2020). Education in Europe: Key Figures 2020, 3rd edition.

In mapping these elements, we rely on the whole-school approach[5] and ecosystems approach to education.

The whole-school approach, for example, is promoted in the European Union (Council Resolution on the EEA)[6], or United Nations Educational, Scientific and Cultural Organisation (UNESCO) in a roadmap for Education for Sustainable Development until 2030[7], and is a commonly used framework in research on student[8] and teacher[9] mental health and well-being, promotion of sustainability education[10], health education[11], improving student literacy[12] and educational attainment[13], gender mainstreaming[14], and building connectedness in schools[15].

Varying definitions of the whole-school approach can be found across different studies. Some define the whole-school approach as involving the physical or built school environment, school values, school climate, organisational functioning, and school system, and government policies[16]. Others emphasise that a whole-school approach attempts to shape the whole-school context, including the school's organisation, management structures, relationships, and physical environment, as well as the curriculum and pedagogic practices. It considers the broader and more holistic aspect of the school setting, instead of just the classroom curriculum[17]. It is also noted that the whole-school approach is about collaboration between different spheres. These spheres are: curriculum, teaching, and learning; school organisation, ethos, and environment; partnerships and services. These spheres all interact, with collaboration specifically between teachers, parents, students, and the wider school community being key[18]. The whole-school approach is said

5 Also referred to as whole-institution approach, term offering larger flexibility when referring to other levels of education.

6 Council of the European Union (2021). Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030).

7 UNESCO (2020). Education for Sustainable Development. A roadmap 2030.

8 See for example European Commission (2021). A systematic whole-school approach to mental health and well-being in schools in the EU; Elfrink, T.R. et al. (2017). Positive educative programme: a whole school approach to supporting children's well-being and crating positive school climate: a pilot study. Health Education, 117(2); Wong, A. et al. (2021). Diffusing innovation and motivating change: adopting a student-led and whole-school approach to mental health promotion. Journal of School Health, 91(12), p. 1037; Smith, J.D. et al. (2004). The effectiveness of whole school antibullying programs: a synthesis of evaluation research. School Psychology Review, 33(4), p. 548; Wyn, J. et al. (2000). MindMatters, a Whole-School Approach Promoting Mental Health and Wellbeing. Australian and New Zealand Journal of Psychiatry, 34(4).

9 Lester, L. et al. (2020). A whole-school approach to promoting staff wellbeing. Australian Journal of Teacher Education, 45(2), p. 2.

10 Mogren, A. et al. (2019). Whole school approaches to education for sustainable development: a model that links to school improvement. Environmental Education Research, 25(4), Bosevska, J. and Kriewaldt, J. (2020). Fostering a whole-school approach to sustainability: learning from one school's journey towards sustainable education. International Research in Geographical and Environmental Education, 29(1), p. 56; Australian Research Institute in Education for Sustainability (ARIES) (2004). Whole-school approaches to sustainability: An international review of whole-school sustainability programs.

11 Thomas, F. And Aggleton, P. (2016). A confluence of evidence: what lies behind a "whole school" approach to health education in schools? Health Education, 116(2).

12 Te Riele, K. et al. (2022). Whole school change for literacy teaching and learning: purposes and processes. Language and Education, 36(4), p. 331.

13 Lewallen, T.C. et al. (2015). The Whole School, Whole Community, Whole Child Model: A New Approach for Improving Educational Attainment and Healthy Development for Students. Journal of School Health, 85(11), p. 730.

14 United Nations Girls' Education Initiative Knowledge Hub.

15 Rowe, F. And Stewart, D. (2011). Promoting connectedness through whole-school approaches: key elements and pathways of influence. Health Education, 111(1).

16 Lester, L. et al. (2020). A whole-school approach to promoting staff wellbeing. Australian Journal of Teacher Education, 45(2).

17 Elfrink, T.R. et al. (2017). Positive educative programme: a whole school approach to supporting children's well-being and crating positive school climate: a pilot study. Health Education, 117(2).

18 Wyn, J. et al. (2000). MindMatters, a Whole-School Approach Promoting Mental Health and Wellbeing. Australian and New Zealand Journal of Psychiatry, 34(4).

to be a proactive, comprehensive, and systemic approach that focuses on building individual competences, developing school policies, and improving social relationships[19]. It is emphasised that a whole-school approach includes not only the formal curriculum, but also the "hidden curriculum" – the networks of school operations[20].

Despite emphasising different elements, all these definitions on the whole-school approach see a school as going beyond the classroom or school itself (e.g. including the wider community, local and national policy context), involving more actors, than just teachers and students (e.g. parents, wider community, various agencies, businesses, and NGOs), and involving elements beyond teaching and learning material or formal curricula (e.g. broader school climate, teacher attitudes, interpersonal relationships). In this approach, all the activity operations and relationships (internal and external) are taken into account, and the definition of a learner is shifted from the one focusing only on students to that covering the whole school with all its actors and elements, which are constantly changing and learning.

The main actors and elements of the whole-school approach framework are presented in Figure 16 below.

**Figure 16. Main actors and elements of the whole-school approach framework**

| Actors | Elements |
|---|---|
| • Students<br>• Teachers<br>• Peers (fellow students, friends)<br>• Parents<br>• Family<br>• School leaders<br>• Administrators<br>• Wider community<br>• Community based professional networks<br>• Local organisations<br>• Local businesses<br>• Institutional partners<br>• Consultants<br>• Policymakers<br>• Social media influencers | • Curricula<br>• "Hidden curriculum[21]"<br>• School climate/ethos<br>• Interpersonal relationships among school members<br>• Teacher attitudes<br>• Community networks<br>• Policy and governance<br>• Physical environment<br>• Resources and school grounds<br>• Pedagogy, learning, inquiry<br>• School organisational structures |

*Source:* Own elaboration.

The whole-school approach is closely related to the educational ecosystem approach. Literature on the educational ecosystem concept emphasises that educational ecosystems use biological ecosystems as an analogy that enables them to derive a framework based on biological ecosystems/using biological categories to then apply them to the exploration of education environments. The subsequent framework has four dimensions: 1) connections, 2) culture, 3) pedagogy, and 4) spaces. Each of them have a mutual influence on each other and develop through such relationships, rather than by being created in a top-down

19 European Commission (2021). A systematic whole-school approach to mental health and well-being in schools in the EU.

20 Bosevska, J. and Kriewaldt, J. (2020). Fostering a whole-school approach to sustainability: learning from one school's journey towards sustainable education. International Research in Geographical and Environmental Education, 29(1), p. 56.

21 Hidden curricula" refers to the socialisation of schooling. It can be identified by the social interactions within an environment. It is in process at all times and serves to transmit tacit messages to students about values, attitudes, and principles. Source: Kentli F. D. (2009). Comparison of hidden curriculum theories. European Journal of Educational Studies 1(2), p. 88.

approach[22]. In the domain of education, ecosystems are understood as the networks of living and non-living entities that are essential for quality teaching and learning. The ecosystems are dependent on the mutual and reciprocal relationships between the living and non-living entities that are influenced by changing social, economic, political, civil, legal, and socio-psychological environments[23]. It is also noted that such ecosystem is an interdisciplinary model that moves away from standardised, top-down systems, towards a more integrated and personalised approach, involving a wider cast of educational providers[24]. Educational ecosystems are characterised by the dynamic interaction among individual learners, diverse setting, where learning occurs, and the community and culture in which they are embedded[25].

The educational ecosystem concept adds to the whole-school approach the dimension of the mutual interconnectedness and reinforcement, and the emphasis on the sporadic nature of the formation of these connections, which moves away from the standardised top-down system.

In line with the whole-school approach and the education ecosystem concepts, we see the school education as a network of mutually reinforcing connections among the different actors and elements going beyond the traditional top-down relationships, confinement to classrooms and schools, as well as student–teacher interactions. We also acknowledge that learning can happen in many different environments and different types of schools, which all influences the implementation and outcomes of the school education.

The main dimensions, actors, and elements of such integrated approach are mapped in Figure 17 below, and are present to varying degrees in nearly all school education systems across the EU

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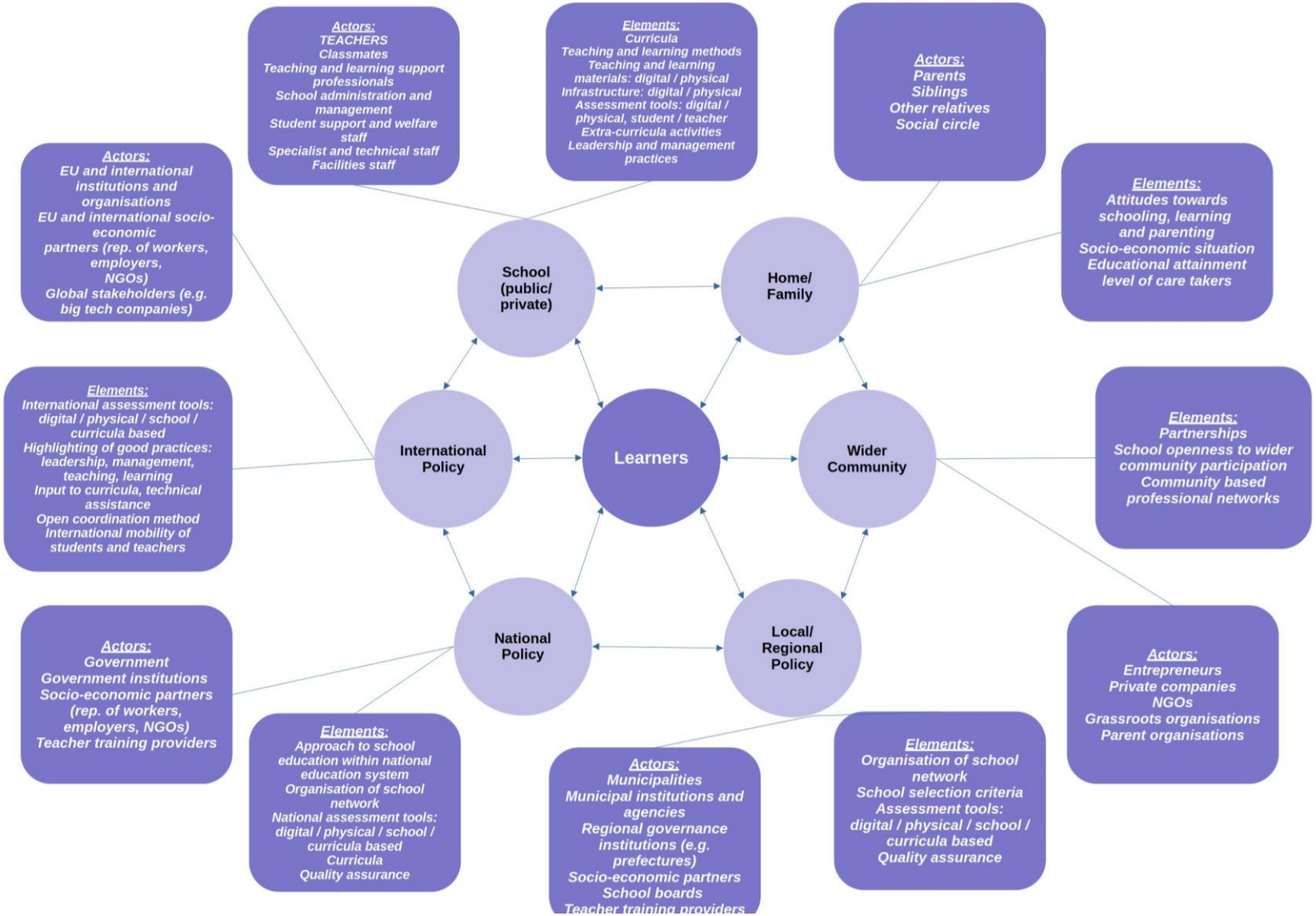
22 OECD (2015). The outward looking school and its ecosystem, p. 9.

23 Bandyopadhyay, S. et al. (2021). Bridging the Education Divide Using Social Technologies, p. vi.

24 The Economist (2020). The learning ecosystems framework, p. 7.

25 Hecht, M. and Crowley, K. (2019). Unpacking the learning ecosystems framework: lessons from the adaptive management of biological ecosystems. Journal of the Learning Sciences, 29(2).

**Figure 17. School education mapping**




*Source:* Own elaboration

## 3.1. Key factors of change of the school education in the EU

This chapter presents the key FoC of school education in the EU that were identified and subsequently used in the drafting of the four scenarios. These FoC were selected by first creating a long list based on a literature review, exploratory interviews, and a horizon scanning exercise. The full list of identified key FoC can be found in Annex 2. The FoC on this long list were then discussed in the Scoping focus group, researched, and future sheets for each FoC were created. The most influential and uncertain FoC were selected, during the Delphi survey, and a shortlist was created, with these shortlisted FoC then used for producing the scenario narratives.

The megatrends were identified through literature review and exploratory interviews, and future sheets were made. It was then decided amongst the team, which would make the shortlist based on an assessment of which have the most influence on school education in the EU.

Wild cards were identified through a literature review, exploratory interviews, and the Delphi respondents. The team, aided by the scenario validation workshop participants, subsequently selected the wild cards for inclusion in the shortlist.

## 3.2. Megatrends

Megatrends are existing clearly observable FoC with long-term development paths. They occur at a global or large scale. They are the great forces in societal development that will likely affect the future in all areas over the next 10-15 years. As a result of the project activities, 11 megatrends were identified as having an impact on school education in the EU and were subsequently considered when building the scenario narratives (presented below).

### 3.2.1. Emerging citizen empowerment and new forms of civic engagement

The new nature of power is characterised by not only consuming, but also sharing, shaping, funding, producing, and co-owning content in a manner that bypasses traditional institutions and agents, such as banks, newspapers, and representative democracy. Not only does this new power flow differently, but it also empowers people to act in fields where this may not have been possible before[26]. The proponents of civic engagement seem to be increasingly empowered. Furthermore, instruments, like citizen assemblies, have gained more attention in recent years[27]. New models of community engagement in education could play a crucial role in the future, with a particular focus on environmental issues. Through such an engagement of local stakeholders (such as parents' associations, NGOs, or grassroots organisations) in decision-making processes, educational institutions could more effectively address the unique needs and concerns of their constituents.

26 Kataja, E. K. (2017). From the Trials of Democracy towards future Participation.

27 Abels, G. et al. (2022). Next level citizen participation in the EU Institutionalising European Citizens' Assemblies. Bertelsmann Stiftung.

### 3.2.2. Climate change and environmental degradation

Increased global demand for resources, including land and water, together with environmental and climate change, may lead to or intensify local and cross-border conflicts[28]. In addition to their role in fuelling conflict, climate and environmental change – affecting in particular water availability (as a primary resource for survival), and soil fertility – may also be increasingly important causes of internal and international migration[29]. Eurobarometer surveys show increasing concern about climate change and the environment. The share of respondents naming climate change as one of the two most important issues facing the EU increased from five percent in 2014 to 24% in 2019[30]. Continued unabated, anthropogenic pollution, and greenhouse gas emissions will further exacerbate changing climate patterns. The climate would continue to change, even if all emissions from human activities suddenly stopped. However, without a much stronger abatement, anthropogenic greenhouse gas emissions will further significantly increase global warming and changing climate patterns[31].

### 3.2.3. Aggravated labour shortages

In Europe, there is an increase in reported average labour shortages as the economy recovers from the 2008 financial crisis, followed by the sovereign debt crisis[32]. There had been a decline in employment rates, due to the COVID-19 pandemic in 2020, but there has since been a rekindling of economic activity and a surge in demand for workers amid concerns of labour shortages. In education, there is already a shortage of teachers and school heads. This shortage has been growing in recent years and is expected to continue to do so[33].

### 3.2.4. Changing nature of work

New generations entering the workforce and older generations working longer are impacting work and employment, career models, and organisational structures. Increases in automation and more flexible, decentralised employment models gain ground. These have the potential to replace both routine and cognitive tasks, while, at the same time, increasing the need for new (technical) skills[34]. There is a shift in the demand for skills among workers. The demand for less-advanced skills that can be replaced by technology is declining. Simultaneously, the demand for advanced cognitive skills, socio-behavioural skills, and skill combinations associated with greater adaptability are rising[35]. In an evolving educational landscape, teachers will be required to have proficient technical skills and decent knowledge of emerging technologies to support their instructional practices. The synergy between Artificial Intelligence (AI) and teachers' work will reshape the school education system. Its results will depend on the efficiency and effectiveness of this integration.

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28 European Environment Agency (2019). The European environment —state and outlook 2020. Knowledge for transition to a sustainable Europe.

29 Food Security Information Network (2018). Global Report on Food Crises 2017. World Food Programme.

30 European Commission (2019). Standard Eurobarometer 92 – Public opinion in the European Union.

31 European Commission (2023). The Megatrends Hub: Climate change and environmental degradation.

32 European Investment Bank (2019). EIB Working Papers 2019/05 – Skill shortages and skill mismatch in Europe: A literature review.

33 Adăscăliței, D. et al. (2021). Eurofound. The pandemic aggravated labour shortages in some sectors; the problem is now emerging in others.

34 European Commission. The Megatrends Hub, Competence Centre on Foresight (EC): Changing nature of work.

35 Hanushek, E.A. et al. (2017). Coping with change: International differences in the returns to skills, Economics Letters 153(April): 15–19.

### 3.2.5. Diversification of education and learning

New generations and hyperconnectivity are rapidly changing both demand and delivery of education. Advancements in science, the vast access to information, new pedagogical approaches, and an emphasis on lifelong learning are diversifying interests and ways of learning, as well as access to education. Schools are transforming from classes, classrooms, and curricula, towards exploring, customisation, and coaching. Through the diversification of education and learning, the term "educator" is evolving - the learning ecosystem diversifies, and teachers take up new roles. The European Union outlines a shift to interdisciplinary education as being an important trend transforming education as we know it. Skills, such as problem solving, critical thinking, ability to cooperate, creativity, computational thinking, self-regulation, are more essential than ever before in our quickly changing society. The need for investments in basic skills (such as basic reading, mathematic, or science skills) of youths are "more relevant than ever[36]". We have already seen increase in blended learning, which provides each student with a more individualised learning experience, where students can take charge of their education and control time, place, and pace of learning[37].

### 3.2.6. Accelerating technological change

Technologies are changing our way of life, the nature and speed of new scientific discoveries, and transforming systems of production, management, and governance. Through technology we are building connections between reality and the digital world. People and objects can be created to exist in parallel with a digital version of themselves in a digital world – a world that mimics the real world. There is a growing impact of technology and digital connectivity on how we live, socialise, work, produce, and govern[38]. AI is an emerging field in education studies, both in the EU and internationally. Several studies have highlighted the benefits of AI for inclusion – pre-dominantly in terms of the added benefits associated with differentiated and "hyper-personalised" learning[39]. At the same time, massive digitalisation and data collection could cause (and has done so) safeguarding concerns and risks to individual privacy, while catering to the monetary interests of tech companies[40].

### 3.2.7. Positive change of attitudes towards sustainability of the younger generation

Sustainable lifestyles are increasingly embraced by people in Western societies, especially by younger generations (e.g. 'millennials'), often motivated by climate and environmental concerns[41]. Public awareness of the importance of climate change mitigation is increasing. Support for action has equally increased over the last decade. Most young people are aware of climate change and global warming, and the need to be sustainable[42]. The role of school education emerges in the hierarchy of factors determining the students'

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36 Council of the European Union (2018). Council Recommendation of 22 May 2018 on key competences for lifelong learning. (2018/C 189/01).

37 Goldman Sachs (2019). The Future of Learning: Transforming Education in the digital era.

38 European Commission. The Megatrends Hub, Competence Centre on Foresight (EC): Accelerating technological change and hyperconnectivity.

39 European Commission / DG EAC (2021). Enhancing learning through digital tools and practices: how digital technology in compulsory education can help promote inclusion: final report.

40 OECD (2020). Back to the Future of Education: Four OECD Scenarios for Schooling.

41 European Environment Agency (2020). Drivers of change of relevance for Europe's environment and sustainability.

42 European Commission (2020). Special Eurobarometer 501: Attitudes of European citizens towards the Environment. Directorate-General for Communication.

attitudes towards the idea of sustainable development[43]. Different approaches to sustainability education will be applied across schools to promote environmental awareness and sustainability.

### 3.2.8. Increasing significance of migration

The social and political significance of migration has increased, and Europe is a prime migration destination, with immigration to the continent expected to continue. This is foreseen to grow in the future significantly, due to forced mass migration induced by the climate change and ecological disasters[44]. Growing socio-economic inequalities in Europe and the increasing diversity in European classrooms, due to mobility and migration calls for more culturally and linguistically sensitive and equitable assessment practices. There will be increasingly more students and teachers with migrant backgrounds in the classrooms across the EU. It is likely that we will see more diversity among both students and teaching staff in the future[45]. Young learners will be increasingly confronted with several cultures and habits, experience multiple transitions between different school systems, and school languages[46].

### 3.2.9. Changes in public expenditure

Considering the current shifts in the economic climate towards higher interest rates in the EU making public debt costlier, the competition for public financing between education and other policy areas is expected to become more intense over the next years. Furthermore, the aging population affects public revenue: this phenomenon decreases the labour force, and, therefore, it reduces the state's revenue capacity. An older population also entails higher spending in other policy areas (including pensions, healthcare and long-term care), while there may possibly be less political push for expenditure on education for the next generation. Education has been one of the most affected sectors by the COVID-19 pandemic[47]. Adequate public funding is necessary to support the various needs of the education system: from infrastructure to teacher wages and training and environmental education programmes. Robust investment in public education can ensure that all students, regardless of their socio-economic background, have access to high-quality learning opportunities and resources, while a lack of adequate public funding for the school system would lead to disparities in resources and opportunities among different schools, as wealthier institutions may have access to better facilities, technology, and teaching staff.

### 3.2.10. Widening inequalities

The absolute number of people living in extreme poverty has been declining. But the gap between the wealthiest and poorest of the population is widening. Different types of inequalities in society are persistent and expanding, despite progress to redress them. Inequalities in education, the labour market, and health are widening. At the same time, gender and territorial inequalities persist. An uneven distribution of wealth, income, and the adverse effects of climate change around the world is growing[48]. Tackling inequalities is a political priority for the European Commission. Rising inequalities impact negatively on democratic, social, and political participation and inclusion. The goal of reducing inequality includes addressing inequalities in

43 Dacko, M. et al. (2021). The role of education in shaping attitudes of academic youth towards sustainable development. European Research Studies Journal, 24(1), pp. 187-197.
44 European Commission. The Megatrends Hub, Competence Centre on Foresight (EC). Increasing significance of migration.
45 European Commission / DG EAC (2020). Prospective report on the future of assessment in primary and secondary education.
46 European Commission / DG EAC (2017). Multilingual education in the light of diversity: lessons learned: analytical report.
47 European Commission / DG EAC (2023). Investing in education 2023.
48 European Commission. The Megatrends Hub, Competence Centre on Foresight (EC): Widening inequalities.

the education system[49]. Equity can be fostered by attempting to make it that all students, regardless of their background or abilities, receive the support they need to achieve the shared learning outcomes. However, it can be vulnerable to fluctuations in funding.

### 3.2.11. Increasing digital divide

There is evidence of a "digital divide" – women and girls, older people, lower-educated, unemployed or inactive people, and people employed in low-skilled jobs do not receive the necessary exposure to keep up with the technological developments and risk being left behind[50]. There is a divide in the type of technologies and skills that students and teachers use or feel comfortable using. Students seem to be less confident in performing basic tasks, such as producing text files, compared to teachers, who feel most confident in such basic activities. Meanwhile, students seem to be more confident regarding coding and programming apps or programmes, whereas teachers feel less confident in such more complex tasks[51]. Given the existing and continuing social and economic inequalities into which digital education tools will be further introduced, the continuation of various forms of digital divide and inequality should be anticipated. Education participation might be increased by technologies, but that does not necessarily result in the widening of education participation especially of those groups that were already not involved[52]. There is a risk that digitalisation implies exclusion, as those excluded will miss the opportunities given by education, if they do not have the skills and tools to fully participate. This will have implications on their future chances in life, including work force participation. While education is usually seen as a tool for inclusion, it can deepen the social gap, if not done in an inclusive way[53].

## 3.3. General trends

General trends are an observed general tendency or direction of a development or change over time. A general trend may be strong or weak, increasing, decreasing, or stable. There is no guarantee that a general trend observed in the past will continue in the future. Typically, general trends are the most consolidated changes observed. Six general trends were identified in cooperation with involved stakeholders as having significant influence on school education in the EU and were subsequently considered, when building the scenario narratives (presented below).

### 3.3.1. Shortage of competent teaching staff

Current trends are showing that a shortage of teaching staff is increasingly significant[54], with a shortage of qualified teaching staff seen at both the national and subnational levels. Before the pandemic, well-trained and experienced teachers were already unequally distributed with stark differences between urban and

49 European Commission / DG EAC and DG RTD (2016). Great start in life: the best possible education in the early years.
50 European Commission (2022). Education and Training Monitor 2022, Comparative report.
51 European Commission (2019). 2nd Survey of Schools: ICT in Education. Objective 1: Benchmark Progress in ICT in Schools. Final Report.
52 UNESCO (2021). Digital technology and the futures of education – towards 'non-stupid' optimism. Paper commissioned for the UNESCO Futures of Education report.
53 European Parliament / Policy Department for Structural and Cohesion Policies (2019). Research for CULT Committee – Education and Youth in the European Union, Current challenges, and future prospects.
54 European Commission / EACEA / Eurydice (2021). Teachers in Europe: Careers, Development and Well-being. A Eurydice report.

rural settings, and this has worsened[55]. These shortages are caused by the aging population of teachers and worsening working conditions making attracting new teachers difficult. These factors combined with an unsatisfactory salary and poor career progression opportunities is contributing to a potential unprecedented shortage of teachers in the future[56]. For more details, see section 5.1.4 Role of Teachers, Teacher role, competences and working conditions.

### 3.3.2. Inequality in education

Current trends are showing that inequality in education among MS and EU regions is high and will continue to be a significant issue in EU school education. Numbers of early leavers from education and training are higher in the southern and south-eastern MS, while among those, the number of early leavers is considerably higher in rural or island regions[57]. Also, evidence suggests physical school closures have widened educational inequities. For example, in the Netherlands, learning losses (impacts of physical school closures on learning progress) were 60% higher among students living in households, where neither parent had achieved qualifications above lower secondary education-level[58]. Inequality can also be seen regarding students with a migrant background, as they are 12.9 percentage points more likely to become early school leavers, and 7.1 percentage points less likely to attain a tertiary education than the overall EU average[59]. Intergenerational transmission of advantage is another important aspect of inequality in education. Young people whose parents have a low level of education are nine times more likely to be early school leavers than young people whose parents have a high level of education[60], and on average 77% of students, who have at least one parent that has tertiary education, are expected to complete university, while only 57% of their peers are expected to do the same with parents who have lower than university degree[61]. Finally, gender inequality can also be seen. Women outperform men in most EU-level education statistics. Combined underachievement in reading, maths, and science is about three percentage points less common among girls and higher education attainment is no less than 11.1 percentage points more common among women[62]. However, gender roles and stereotypes continue to play a particularly important role in influencing the educational and occupational choices. Women still shy away from Science, Technology, Engineering, and Mathematics programmes[63]. For more details, see Section 5.1.2 Education System, Inclusion of learners in a disadvantaged situation.

### 3.3.3. Blended and personalised learning in schools

Current trends show that blended learning is increasing in schools in the EU. Action 2 of the EU's Digital Education Action Plan involves developing a shared understanding about the use of blended learning in the future, which would combine traditional learning at school with learning in other environments, such as training centres, distance learning, companies, outdoors, cultural sites, etc.[64] Digital technologies have also been increasingly integrated into classroom practices across OECD countries, including smartboards, game-

55 UNESCO (2021). Reimagining our futures together. A new social contract for education.
56 Ibid.
57 European Parliament / Policy Department for Structural and Cohesion Policies (2019). Research for CULT Committee – Education and Youth in the European Union, Current challenges and future prospects.
58 European Commission (2022). Education and Training Monitor 2022, Comparative report.
59 Ibid.
60 Ibid.
61 OECD (2022). Education Fast Forward: Building a future that works for all.
62 European Commission (2022). Education and Training Monitor 2022, a comparative report.
63 OECD (2022). Education Fast Forward: Building a future that works for all.
64 European Commission. Digital Education Action Plan (2021 – 2027) – Action 2.

based learning, online learning systems, virtual worlds, online peer and self-assessment tools[65]. The use of digital tools in education is also clearly growing. In 2011-12, only 29% of students reported use of ICT in more than 25% of the lessons in primary schools, and, by 2017-18, this number had increased to 71%. The number has also increased from 32% (2011-12) to 58% in lower secondary schools by 2017-18[66]. Also, in Europe, 32% of students in primary schools had access to a virtual learning environment (VLE) in 2017-18, as compared to 27% in 2011-12; while for lower secondary schools, 61% of students have access to VLE compared with 54% in 2011-12[67]. Away from digital tools, the benefits of learning outside the classroom are being increasingly studied, with a 2022 study on nature-specific learning outside of the classroom finding that it has measurable socio-emotional, academic, and well-being benefits, and should be incorporated into every child's school experience[68]. Current trends are also showing that the increase in blended learning will provide students with a more personalised learning experience, where students can control time, place, and pace of learning[69]. Digitalisation can enable a greater focus on personalised learning, allowing education to move away from standardised models of delivery and towards bespoke interactive learning experiences. Machine learning can be applied to student data to develop AI teaching options, which could then create new options for delivery of teaching materials[70]. AI can also personalise learning experiences and through the in-time collection and processing of data can provide adaptive and individual feedback[71]. Overall, the next generation Ed Tech (Education Technology) promises the rise of individualised learning systems that would be directed towards individual students and their learning processes[72]. For more details, see Section 5.1.3. Pedagogical approaches, Personalised and blended learning.

### 3.3.4. Decreasing relevance of education to current labour market needs

Current trends are showing that the link between formal school education and work is increasingly broken. Formal education used to be a guarantee for a job. Today, this is no longer the case[73]. Because of this, we have already been witnessing an erosion of formal education credentials (e.g. graduation certificates, degrees) as signals of competence. A lot of education is simply not enough for succeeding in today's labour market. Only half of the EU population aged 15 years and above felt their school education helped them to develop entrepreneurial competencies[74]. Automation is increasingly changing the future job landscape and education is not changing to reflect this. Nearly 14% of jobs in OECD countries are likely to be automated, while another 32% are at high risk of being partially automated. Young people and those with low skills are those at highest risk – but new technological developments are now also affecting the jobs of the high-skilled too[75]. For more details, see Section 5.1.5 Curriculum Structure, Alignment with labour market needs.

65 European Commission / DG EAC (2020): Prospective Report on the Future of Assessment in Primary and Secondary Education.

66 European Commission (2019). 2nd Survey of Schools: ICT in Education. Objective 1: Benchmark Progress in ICT in Schools. Final Report.

67 Ibid.

68 Mann, J. et al. (2022). Getting Out of the Classroom and Into Nature: A Systematic Review of Nature-Specific Outdoor Learning on School Children's Learning and Development. Frontiers in Public Health, (10).

69 Goldman Sachs (2019). The Future of Learning: Transforming Education in the digital era.

70 European Education and Training Expert Panel (2019). Issue Paper – Digitalisation of society.

71 Celik, I., Dindar, M., Muukkonen, H. et al. (2022). The Promises and Challenges of Artificial Intelligence for Teachers: a Systematic Review of Research. TechTrends (66), 616–630.

72 United Nations Educational, Scientific and Cultural Organisation (2021). Digital technology and the futures of education – towards 'non-stupid' optimism.

73 European Commission, European Political Strategy Centre (2019). 10 trends transforming education as we know it.

74 Rand Corporation (2019). Education and youth in the European Union – Current challenges and future prospects.

75 OECD (2023). The future of work.

### 3.3.5. Increasing focus on sustainability education and civic and citizenship education

Current trends are showing an increasing importance of sustainability education in the EU. Many teachers, educators, academics, and youth leaders across Europe are already actively teaching for sustainability, often driven by a sense of responsibility and duty to prepare learners to live, work, and thrive in a highly complex and rapidly changing society and economy[76]. Also, the EU's LIFE Programme on environmental education has co-financed pilot and demonstration projects that contribute to the implementation and development of EU environment policy and legislation, such as specific educational activities and materials about the environment, aimed at school children, young people, teachers, and families[77]. Furthermore, Erasmus+ has financed more than 5 000 projects with a direct focus on learning for environmental sustainability since 2014.[78] Current trends are also showing that there could be an increasing focus on civic and citizenship education. Citizenship education is part of the national curricula for general education in all European countries, and most of these countries provide teachers with guidance materials and other types of resources to support the teaching and learning of citizenship education in the classroom[79]. Overall, there is a shift towards global citizenship skills. Children are taught the skills to navigate in a world which is out of control of individual citizens, and where human activity is pushing planetary boundaries. For example, in Italy, every student in every grade has to study climate change and sustainability as part of the curriculum, and in the 2022 Curriculum for Wales the development of "ethical, informed citizens of Wales and the world" is one of the four key focus areas[80]. Most scholars and policymakers regard intercultural education as the key to citizenship and democracy, and individual countries and international institutions tend to base their policies on that assumption. Most European states have launched the corresponding policy steps, and most of them at least proclaim the importance of intercultural competences and skills among citizens[81]. For more details, see Section 5.1.5 Curriculum Structure, Sustainability, and civic and citizenship education.

### 3.3.6. Deterioration of basic skills

Current trends are showing that while the European Commission stresses the importance of developing literacy, mathematical, science, technology, and engineering competences[82], the share of pupils not reaching basic achievement levels remains higher than desired. There has been strengthening focus on literacy, mathematical, science, technology, and engineering competence, but despite this, overall EU reading and science skills have actually deteriorated between 2009 and 2018[83]. For more details, see Section 5.1.5 Curriculum Structure, Skill, and competence development.

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76 European Commission / DG EAC (2022). Learning for the green transition and sustainable development: staff working document accompanying the proposal for a Council recommendation on learning for environmental sustainability.

77 European Commission (2023). European Climate, Infrastructure, and Environment Executive Agency.

78 European Commission, DG EAC (2021). Data collection and analysis of Erasmus+ projects: focus on education for environmental sustainability : final report.

79 European Commission / EACEA (2018). Citizenship education at school in Europe 2017.

80 World Economic Forum (2020). Schools of the Future. Defining New Models of Education for the Fourth Industrial Revolution.

81 Sikorskaya, I. (2017). Intercultural education policies across Europe as responses to cultural diversity (2006-2016).

82 Council Recommendation (2018/C 189/01) of 22 May 2018 on key competences for lifelong learning.

83 OECD (2018). PISA 2018 Results. European Commission / DG EAC (2019). PISA 2018 and the EU – Striving for social fairness through education.

## 3.4. Emerging trends

Emerging trends are an early sign of a tendency or direction of a development or change over time, which is not yet confirmed or strengthened (into a general trend), and can either develop into a general trend or wither away, as time passes. Emerging trends are less consolidated changes than general trends, but more consolidated than weak signals. Seven emerging trends were chosen in cooperation with stakeholders as likely to be the most influential for school education in the EU and were subsequently considered when building the scenario narratives (presented below). A further two (increased focus on civic and citizenship education and increase of personalised learning) were chosen and merged with general trends.

### 3.4.1. Social risks of digitalisation in schools

Current trends are showing that digitalisation is creating both new opportunities and risks. AI, extended reality, the internet of things, cryptocurrency, and other technological changes impacting children are expected to raise new social and ethical challenges, such as bias, lack of fairness, lack of transparency in AI use, interaction with deep fakes, avatars, and robots[84]. The ethics of digitalisation is also an important issue, there are issues around privacy and the use of individuals' data, particularly in the area of learners. There is also a connection to health, in that technology needs to be used in a way that considers children's health[85]. Another issue is that of harmful content. Cyberbullying can take place anytime and anywhere, without presence of a wider audience, as in the case of offline bullying. In most of the 19 surveyed countries, less than 10% of the children reported being a victim of online bullying, which happened on a monthly basis, while less than five percent reported bullying others monthly online[86]. Overall, the most often reported harmful content children were exposed to "at least monthly" were hate messages (on average 17% of children reported being exposed to hate messages 'at least monthly'), followed by the glory or violent images (average of 13%), and "the ways to be very thin" content (such as being anorexic or bulimic, or thinspiration; average of 12%)[87]. For more details, see Section 5.1.2 Education System, Degree of digitalisation and existing/planned regulation.

### 3.4.2. Focus on general competences

Current trends are showing that general competences are already beginning to be taught in schools. In 2018, 54% of students in the OECD said they were taught how to recognise whether information is subjective or biased at school[88], and general competences, such as critical thinking and interpersonal competences, are already being taught in schools across the globe[89].

84 European Commission (2022). ). A digital decade for children and youth: the new European strategy for a better internet for kids (BIK+).

85 European Commission / DG EAC (2019). European education and training expert panel: summary of findings and of the discussions at the 2019 Forum on the Future of Learning.

86 EU Kids Online. (2020). EU Kids Online 2020: Survey results from 19 countries.

87 Ibid.

88 OECD (2022). Education Fast Forward: Building a future that works for all.

89 Loble, L. et al. (2017). Future frontiers: Education for an AI world.

### 3.4.3. Changing role of teachers

Current trends are showing that the role of teachers is changing from educators and providers of knowledge, to facilitators and supporters[90]. Tasks that teachers used to perform are now increasingly shared among different people and technologies. Also, Learner-Centred Pedagogy (LCP) is a general approach to teaching and learning, which seeks to place the learner at the centre of the learning process, as opposed to traditional Teacher-Centred Pedagogy in which learners passively receive information from teachers. This has been on a rise worldwide for the past decade, especially being promoted by various international organisations[91].

### 3.4.4. Increase in interdisciplinary learning

Current trends are showing that a shift to interdisciplinary education is an important trend transforming education as we know it. Interdisciplinary education is increasingly being included in national curricula across the EU.

### 3.4.5. Increasing school openness

Current trends are showing that across OECD countries, partnerships between schools and a range of local actors are increasing, including parents, medical professionals, libraries, museums, and cybersecurity experts[92]. UNESCO also highlights as a key necessary action for the future, the creation of partnerships between schools and key stakeholders, such as parents/caregivers; teachers and other education professionals; national-, local-, and school-level administrators, civic groups in the community etc.[93]. In general, schools across the EU are becoming increasingly more open to involving parents, collaborating with various actors of local communities. It is visible also in education governance with local communities, parents, students, and other stakeholders increasingly involved[94].

### 3.4.6. Increasing expenditures in private education

Current trends are showing an increase in private spending in the EU. Eurostat data shows that between 2013 and 2019, private spending on education (ISCED 1-3) increased in 22 EU countries (in terms of money spent), with an average increase of 38% amongst these countries[95]. Between 2012 and 2018, private spending on educational institutions (in terms of share of overall spending) increased moderately in non-tertiary education (primary, secondary, and post-secondary non-tertiary education), with the OECD average being a one percentage point increase. The highest increase during this period was in Estonia, Latvia, and Italy, which each saw an increase of more than three percentage points[96]. As part of this, current trends are showing an increasing investment in shadow education. Every country in the EU now has some form of shadow education, which has grown considerably in recent years. While tutoring was already prevalent in Southern and especially Eastern Europe (where it is an established part of the culture), the volume of tutoring in Western Europe has greatly increased, and it has begun to appear in Northern Europe too, despite

90 Szűcs, E. (2009). The role of teachers in the 21st century.
91 Bremner,N., Sakata,N., and Cameron L. (2022). The outcomes of learner-centred pedagogy: A systematic review, International Journal of Educational Development (94).
92 OECD (2022). Education Fast Forward: Building a future that works for all.
93 UNESCO (2020). Towards inclusion in education: status, trends and challenges: the UNESCO Salamanca Statement 25 years on.
94 From exploratory interviews.
95 Eurostat. Private educational expenditure by education level, programme orientation, type of source, and expenditure category.
96 OECD (2021). Education at a glance.

it historically not occurring there, due to their strong education systems. For example, Denmark has had a 458% increase in the number of shadow education businesses between 2009 and 2018[97]. The common trend in Europe of shadow education participation is upwards, and this is likely to accelerate in the next decade, due to the expansion of online tutoring[98].

### 3.4.7. Increasing inclusion of students in a disadvantaged situation

Current trends are showing that throughout Europe growing numbers of students, who have been diagnosed with a disability or special educational needs (SEN), are attending mainstream schools, instead of being educated in special schools or classes[99]. The focus on diversity and inclusion in teacher training that was emerging in the late 2010s has expanded. Personalised education has become the principal strategy for achieving inclusive education. Teachers are better trained and able to devise high-quality individual learning plans for students, in cooperation with professionals from other disciplines[100]. Inclusive education is the first principle of the European Pillar of social rights, which underlines that "everyone has the right to quality and inclusive education, training, and life-long learning, in order to maintain and acquire skills that enable them to participate fully in society and manage successfully transitions in the labour market"[101]. Early school leaving is more frequent among young people from disadvantaged backgrounds, from migrant backgrounds and ethnic minorities, and, more generally, among boys[102]. The European Education Area set two targets to be achieved by 2030: the rate of early leavers from E&T aged 18-24 to be below nine percent, and at least 45% of people aged 25-34 to have completed some form of tertiary education[103]. Trends showed that, in the decade up to 2020, there were a continuous decrease of early school leavers and a steady increase in tertiary education completion[104]. For more details, see Section 5.1.2 Education System, Inclusion of learners in a disadvantaged situation.

## 3.5. Weak signals

Weak signals are an early sign (e.g. event, new technology or practice), anticipating or pointing to possibly emerging issues, which are not yet confirmed and can either develop into an emerging trend, a trend, or wither away, as time passes. Weak signals are the least consolidated changes compared with emerging trends and trends. Three weak signals were chosen in cooperation with involved stakeholders as likely the most influential for school education in the EU and were subsequently considered when building the scenario narratives (presented below).

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98 Bukowski, P. (2017). Shadow Education within the European Union from the Perspective of Investment in Education.

99 Schwab, S. (2021). Inclusive and Special Education in Europe; In: The Oxford Encyclopaedia of Inclusive and Special Education.

100 Rand Corporation (2019). Education and youth in the European Union – Current challenges and future prospects.

101 European Commission's website on inclusive education.

102 Eurostat (2012). Europe 2020 Strategy towards a smarter, greener, and more inclusive EU economy?

103 Council of the European Union (2021). Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030).

104 European Commission (2019). Assessment of the Europe 2020 Strategy.

### 3.5.1. Partial replacement of teachers with AI

Current trends are showing that by 2040 there could have been a partial replacement of teachers with AI. It was suggested by UNESCO that highly trained, well-salaried professional teachers might not be required anymore and AI in classrooms could lead to de-professionalisation where teachers and assistants are facilitators of the technologies[105]. Learner facing AI could also identify gaps and difficulties in student learning and adjust materials to students' needs[106]. AI automated exam and essay scoring could make the process more efficient and objective and could also be used to provide teachers with feedback regarding their teaching[107].

### 3.5.2. Emergence of the alternative ways of schooling

Current trends are showing that, with millions of parents now working from home, their increased flexibility and their first-hand experience with remote learning has encouraged more people to explore alternative educational models, such as home-schooling or outdoor schooling. For example, forest-school numbers have been increasing across Europe[108]. Another alternative way of schooling that has been growing is Agora, which began in the Netherlands in 2014, and has spread across the country and beyond, into Belgium and Poland[109].

### 3.5.3. Increasing impact of Ed Tech on education

Current trends are showing that COVID-19's disruption of education has allowed the impact of business on education to increase. The scramble for material and platforms during the pandemic resulted in digital platforms provided by private companies. There is a danger that further digital transitions in education could be pushed by these private technology companies, posing a threat to the autonomy of the teaching profession, and potentially resulting in increased digital divides, as not every school could afford the new technologies[110]. Private education technology companies have been allowed to grow and even stay relevant post-COVID, as they have been able to fill gaps that already existed in education curricula[111]. The Ed Tech industry is currently fragmented, with multiple start-ups, but big platform companies, like Microsoft, Google, and Apple, are clear players, with these players expected to continue to play a powerful role in institutions in the future. The proliferation of learning apps, created by private companies, is expected to continue, with those focusing on ISCED 1-3 the most popular. Private companies offering 'tuition on demand' has also been increasing, through connecting with tutors online through platforms, such as Chegg, or through using apps, such as Duolingo[112].

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105 United Nations Educational / Scientific and Cultural Organisation (2021). Digital technology and the futures of education – towards 'non-stupid' optimism. Paper commissioned for the UNESCO Futures of Education report.

106 Baker, T., Smith, L., and Anissa, N. (2019). Educ-AI-tion Rebooted? Exploring the future of artificial intelligence in schools and colleges.

107 Celik, I., Dindar, M., Muukkonen, H. et al. (2022). The Promises and Challenges of Artificial Intelligence for Teachers: a Systematic Review of Research. TechTrends 66, 616–630.

108 Forest School Foundation (2020). A Brief History of Forest Schools Around The World.

109 Visie Agora (n. d.).https://www.verenigingagoraonderwijs.nl/visie/ Visie Agora – an education association.

110 International Commission on the Futures of Education (2020). Education in a post-COVID world: Nine ideas for public action.

111 Forbes (2020). The COVID-19 Crisis Is a Boost to Educational Technology Companies.

112 Goldman Sachs (2019). The Future of Learning: Transforming Education in the digital era.

## 3.6. Wild cards

Wild cards (a.k.a. black swans) are surprising and rare events that might constitute turning points in the evolution of a certain school system(s). Their characteristics include extremely low probability and dramatic impact. Examples of a wild card/black swan are COVID-19 and the 9/11 attacks. Wild cards were suggested during exploratory interviews and by Delphi survey respondents. Four wild cards were identified as being the most plausible for influencing school education in the EU during consultations with stakeholders at the Scenario validation workshop.

### 3.6.1. Major technological disruption in Europe

This would involve, for example, a foreign cyber-attack on digital education systems and network infrastructures, an internet meltdown, where computer networks become marginally functional or fail to function at all, or a massive digital security breach in which hostile parties gain access to sensitive data or confidential information. This could lead to national government and education authorities centralising and regulating the use of technologies in education systems, leading to a low adoption of AI in education and schools being free of the influence of big Ed Tech companies.

### 3.6.2. Environmental crisis caused by climate change

This would involve, for example, rising temperatures fuelling environmental degradation, natural disasters, weather extremes, food and water insecurity, agricultural droughts affecting crops, and mass climate migrations. This could lead to sustainability being integrated into education systems, through community environmental awareness, engagement, local action and cooperation, and sustainability education permeating schools' curricula, which would be oriented towards green local economies.

### 3.6.3. Deep economic crisis in the EU

This would involve, for example, a severe economic contraction, depression, or recession that lasts several years, high bankruptcy rates and high unemployment, and a breakdown in normal economic activities, caused by hyperinflation. This would lead to disparities in resources and opportunities leading to significant inequalities and very low levels of inclusion and diversity in education, with social fragmentation and a shortage of teaching staff leading to overcrowded classrooms and high student drop-out rates.

### 3.6.4. Crisis of the public school system

This would involve, for example, teachers fleeing the public school system and migrate to private schools, due to their decreasing numbers and low pay. This would lead to a significant fragmentation of teacher training and teacher careers, and AI stepping in to replace the cognitive part of teachers' work.

# 4. Alternative scenario narratives

The following scenarios are meant to represent future pictures of what schools (and the wider education system/structure) might look like in 2040. These scenarios illustrate the effects of a variety of phenomena that can either be already observed at present times or/and that are likely to emerge in the near future on the school system. Though 2040 is chosen as the "snapshot" year, it is not to be misunderstood as an endpoint, but rather as a representation of a specific moment in time. The trends and drivers identified in this report/project are likely to have influence and evolve well beyond 2040.

Moreover, the scenarios do not forecast the future reality and we do not expect the future to unfold precisely like one of the described ways. These are just representations of potential alternative futures and idealised[113] types of what might happen. This means that not all of the foreseen elements are actually going to take place, and reality will almost certainly not look like one particular scenario, but rather as a combination of all of them. In fact, the scenarios are a useful and appropriate tool, to steer the flexible mindsets that are necessary in times of unpredictable change, to help identify and qualify the policies that can/should be enacted today to reach a given end point in 2040, and sketch the corresponding pathways, possibly pinpointing major milestones between present times and 2040.

Each scenario narrative comprises a number of invariant elements. To capture the nuances and eventualities beyond these variant elements, each scenario also includes variant elements (e.g. dominant socio-economic approach to education, sufficiency of public education funding), which fulfil a contextualising function in the developments of the FoC. The elements present in each scenario fall under five dimensions, namely:

- Education policy
- Education system
- Pedagogical approaches
- Role of teachers
- Curriculum structure

Though distinct, these areas are in reality often interlinked. This is why some of these dimensions are discussed in combination.

Each scenario also includes a wild card that can take one of the following four forms: A) major technological disruption; B) environmental crisis caused by climate change; C) deep economic crisis in the EU; D) crisis of public school system. A "wild card" is a surprising and rare event that would constitute turning points in the evolution of a certain school system. A wild card is characterised by a very low probability but significant impact. An example of a well-known 'wild card' would be the COVID-19 pandemic, which, just as any historical pandemic, represented a turning point catalysing change thereby shaping entire societies.

[113] Ideal types were developed by Max Weber as an analytical tool to understand social reality. He characterised ideal types as "both abstracts from reality [that] at the same time [help] us to understand it". It is ideal because it is 'not "real", it does not represent the directly observed experience in its totality. Based on: Oliverio, A. (2020) The Importance of Models in Sociology: The Example of Max Weber. Advances in Applied Sociology, 2020, 10, 1-10; Weber, M. (2013) Economy and Society, Vol I., edited by Roth, G. and Wittich, C. Oakland, California: University of California Press.

## 4.1. Scenario A: Standardised and Collaborative

In 2040, the European social and economic context fosters ongoing **collaboration**, innovation, and a commitment to addressing complex challenges, while promoting sustainability and resilience. The dominant educational model and its approach to presenting instruction and learning experiences to students is one that relies on a **standardised** and **conventional approach**; one that has been historically prevalent in many school systems.

### 4.1.1. Changes in educational policy and system

#### *Coordinated socio-economic approach*

In this scenario, the main strategies for the social and economic development of the education systems follow a coordinated approach. Educational policies and initiatives are aligned with broader socio-economic goals, including the need to address ongoing environmental challenges. By focusing on the interplay between education and the broader socio-economic context, policymakers create an integrated and coherent approach to addressing educational challenges, while promoting environmental awareness and sustainability.

#### *Consensus on major issues*

A general consensus is established on some major educational issues. These issues include fostering equity within the education system, by attempting that all students, regardless of their background or abilities, receive the support they need to achieve the same learning outcomes; developing competences that equip students with the necessary skills and knowledge for success in the rapidly changing world, including environmental literacy and sustainable practices; and securing adequate public funding to support the various needs of the education system, from infrastructure to teacher wages and training, and environmental education programmes.

#### *Central policies and regulations promote integration*

Societal and civic challenges are faced by central policies and regulations, which promote, through intentional planning, the integration of people in a disadvantaged situation (e.g. disabilities, health problems, economic barriers) in mainstream schools. In practical terms, integration implies placing students with diverse needs and backgrounds (e.g. gender, migrant status, minorities) into existing educational structures by ensuring that students from diverse backgrounds are seamlessly woven into the fabric of the school community, allowing them to feel like active participants and contributors. This produces a uniform, homogenous school system that partially reduces inequity. Although a more equitable system improves access to quality education for all students to a certain extent, it also stifles diversity and innovation.

#### *Social homogeneity in schools*

One of the prominent features in the European educational systems is social homogeneity in schools. This means that students from similar social, economic, and cultural backgrounds tend to attend the same schools, fostering a more uniform environment. While this has the potential to create a strong sense of

community and shared values, it also limits exposure to diverse perspectives and experiences and increases comparisons and competition between students. A sense of mainstream belonging is cultivated among students, teachers, and other stakeholders in the education system. By fostering a shared sense of identity and purpose, this sense of belonging leads to increased engagement and motivation among all members of the educational community. This, in turn, contributes to more successful learning outcomes and a stronger commitment to the goals and values of the education system.

#### *Private tutoring complements public school education*

Private supplementary tutoring plays a certain role in complementing public school education. In some cases, students who seek additional support or wish to excel in specific subjects turn to private tutors. This supplementary tutoring helps bridge eventual gaps in the public-school system, providing personalised learning opportunities that might not be readily available in the classroom.

### 4.1.2. Pedagogical approaches and curriculum structure

#### *Standardised and homogeneous pedagogical and teaching methods*

Pedagogical and teaching methods are significantly standardised and homogeneous. This results in a uniform learning experience for students across different schools and regions. At a policy-level, the education system prioritises the development of general competences, such as critical thinking, problem-solving, and communication skills. However, teaching and learning is organised into conventional disciplinary subjects, such as mathematics, science, and languages, without much emphasis on the interconnections between these subjects, i.e. interdisciplinarity. This approach leads to relatively fixed forms of knowledge[114], with students learning subject-specific content without necessarily understanding the broader context and connections. The emphasis on proficiency in literacy and numeracy is achieved through the enforcement of standardised curricula. The very concepts of literacy and numeracy are widened beyond language and numbers to include technology, environmental issues, civic and citizenship competences, and mental health. Nevertheless, approaches to developing technological and environmental literacy, civic engagement, and addressing mental health issues are limited to integrating specific subjects focusing on these issues into the curriculum, without embedding them horizontally over the different subjects and integrating them into an overall schooling experience. The prevalence of summative assessments and the standardised nature of education delivery hinder the widespread adoption of personalised learning approaches, which tailor education to individual students' needs and preferences. For the same reasons, parenting styles lean towards the authoritarian, with parents enforcing strict discipline and high expectations for academic achievement.

[114] It is important to note the difference between "knowledge" and "competences" in this set of scenarios. Knowledge refers to the understanding of facts, principles, and information, while competences encompass the practical application of knowledge, skills, and abilities to perform tasks effectively. Source: Council Recommendation of 22 May 2018 on key competences for lifelong learning (2018/C 189/01).

### *Limited integration of technology*

Teaching methods include a combination of a traditional face-to-face instruction and digital learning, reflecting a moderate adoption of blended learning[115]. Teachers employ technology to facilitate learning, but its integration is limited, and the primary mode of instruction remains in-person. Certain courses or subjects follow the enriched virtual model of blended learning, in which students have required face-to-face learning sessions with their teacher, and then are free to complete their remaining coursework remote from the face-to-face interaction. Online learning is the backbone of student learning when the students are located remotely. The highly regulated adoption of AI in this scenario limits the automation of personalised learning strategies. Digitalisation, which refers to the process of implementing digital technologies and resources in education, is centralised. The digitalisation process is managed and controlled by a central authority. Due to centralisation and heavy regulation, schooling remains relatively closed to external influences, such as the Ed Tech sector. This closed nature limits the degree to which schools integrate new technologies and innovative approaches from external sources, potentially hindering the advancement of education and limiting the benefits these innovations might bring. While centralised digitalisation offers numerous benefits (e.g. reduction of costs, optimisation of resources, unified vision), it raises privacy risks, due to the collection, storage, and sharing of students' personal data. To mitigate these risks, responsible tech-use guidelines and protocols are developed and implemented, protecting student data privacy, while taking advantage of the benefits offered by digitalisation in education.

### *Moderate adjustments of the education system to the labour market needs*

A combination of the focus on technological and environmental issues, and a standardised and conventional approach to teaching and learning (including the prevalence of summative assessment), results in the students acquiring the medium level technical skills required for the current labour market. As the demands of the workforce and society continue to evolve, it becomes increasingly urgent for educational institutions to adjust their curricula and teaching methodologies in response.

## 4.1.3. Roles and competences of teachers

### *Teachers are a source of knowledge and authority*

A teacher-centred approach positions teachers as the main source of knowledge and authority in the classroom. As a result, they need strong subject matter expertise, effective communication skills, and the ability to maintain a structured learning environment. Teachers focus on traditional tasks, such as lesson planning, direct instruction, classroom management, and assessment, while providing individual support to students. While teachers are expected to be proficient in using basic technology to support their pedagogical approaches, they are not necessarily required to possess advanced technical skills or in-depth knowledge of emerging technologies. Although AI adoption is low, teachers remain adaptable and open to continuous learning, staying up to date with the evolving educational landscape.

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115 Blended learning can involve either blending school site and other physical environments away from the school site, or blending different learning tools that can be digital (including online learning) and non-digital. Source: Council Recommendation of 29 November 2021 on blended learning approaches for high-quality and inclusive primary and secondary education (2021/C 504/03).

*Investments in training deal with shortages of competent teachers*

Due to adequate public education funding, the wages of teachers are appealing and the profession attracts many new talents, but the requirements for teachers in a teacher-centred approach are high and many of the newcomers, as well as more experienced teachers, are not competent enough. Therefore, the issue of lack of competent teaching staff remains. The issue is being resolved by large scale investments in teacher training.

### 4.1.4. Wild card leading to Scenario A

In the event of a **major technological disruption** in Europe (e.g. a foreign cyber-attack on digital education systems and network infrastructures, an internet meltdown, where computer networks become marginally functional or fail to function at all, a massive digital security breach in which hostile parties gain access to sensitive data or confidential information), national governments and education authorities centralise and strongly regulate the use of technologies in education systems. Accordingly, there is a low adoption of AI which is highly regulated, blended learning is implemented in moderate way, and centralised processes of digitalisation allow schools to be free from the influence of big Ed Tech companies. However, privacy risks remain when tech-use guidelines and protocols occasionally fail.

### 4.1.5. A day in Scenario A

My name is Patricia and I am the head of "A" Secondary School. As I get ready for the day, my mind races with the myriad of responsibilities that await me. Our school is known for its rigorous academic standards, and it is my duty to ensure that our students receive the best education possible. I open my email to read the latest communication from the Ministry of Education on the integration of sustainability education into the school curriculum. At "A" Secondary School, we take great pride in being part of an education system that creates an integrated approach to address educational challenges, while promoting environmental awareness and sustainability. I strongly believe that it is our duty to instil in our students a sense of responsibility towards the ongoing environmental crisis, and we are determined to develop environmental literacy and sustainable practices among them. We follow standardised curricula, to ensure that our students receive a comprehensive and uniform education. One of the key factors that allows us to excel is the adequate public funding that supports our various needs. I am happy knowing that from maintaining our state-of-the-art infrastructure to ensuring competitive teacher wages and continuous training, we are well-equipped to provide the best learning environment for our students. All schools in our education system, including "A" Secondary, follow a common vision guided by the central authorities. In many ways, this makes my life as a head of school easier, as expectations and rules for my job are clearly outlined, and I usually have ready-made solutions for any emerging issues. Furthermore, this cohesion allows us to focus on refining our students' skills and knowledge, empowering them to become well-rounded individuals ready to face the world. Integration is a value we hold dear at "A" Secondary. We welcome students with diverse needs and backgrounds, creating an integrated environment that reduces inequity, by taking a planned approach that fosters a sense of community and belonging, while also promoting an atmosphere of culture of acceptance and understanding (e.g.; establishing clear values and goals that all students can rally around, regardless of their backgrounds; developing a strong school culture; designing activities, events, and projects that provide opportunities for all students to participate together). While integration brings uniformity, we also celebrate the uniqueness of each individual. A celebration of both commonality and diversity is cultivated among our students, teachers, and staff. On the other hand, I sometimes feel that one-size-fits-

all solutions, provided by the central government, do not really fit the realities of our school that require commitment, adaptability, and empathy, and I sometimes wonder if we could come up with any better alternatives, if I had more autonomy in making the decisions concerning our school.

As I walk through the hallways, I see teachers diligently following the guidelines, working tirelessly to equip our students with the foundational skills they need to succeed in their academic journey. They know the expectations placed on our students and push them to achieve their best. Our students are diligent, hardworking, and seldom question authority. As the day progresses, I attend meetings with teachers and staff. In our classrooms, we employ technology to facilitate learning, albeit in a limited capacity, due to stringent regulations from the government, that, despite acknowledging the advantages of incorporating technologies in schools, is also attentive to the potential social risks associated with their implementation. Teachers incorporate digital tools to supplement their lessons and engage students. We adopt an enriched virtual model of blended learning for certain subjects. This approach allows students to have face-to-face learning sessions with their teachers, and then they are free to complete the remaining coursework remotely. This way, we maximize the benefits of in-person instruction, while also leveraging online learning for flexibility and convenience. While AI adoption in our school system is relatively low, I am proud of how our teachers embrace a culture of adaptability and continuous learning. I know that our teachers play a pivotal role in shaping our students' lives. They are a source of knowledge and authority, and their expertise is instrumental in maintaining a structured learning environment. I meet with them to emphasise the importance of continuous learning and staying up-to-date with educational trends. In that sense, we are fortunate to be able to invest in training to address the regular vacancies of competent teaching staff that we experience. I am happy to hear from my teachers that they are, generally, content with their work in our school, though high demands for them and their students can take its toll on some. I must admit that our standards are very high and from time to time I receive complaints about lack of flexibility in teachers. I do agree with these complaints, to some extent, but the benefits of the job, in my opinion, far outweigh the drawbacks.

Later in the afternoon, I meet with concerned parents who want updates on their children's academic progress. Many parents in our community believe in enforcing strict discipline and setting high expectations for academic achievement. While I appreciate their involvement in their child's education, I remind them of aligning with the principles and values we promote at the school**,** when raising their children. With each passing day at “A” Secondary School, I feel a sense of purpose and fulfilment. Together, we are creating an educational environment that nurtures our students' potential**,** and empowers them to make a positive impact on society. As the sun sets on another productive day, I know that our journey towards excellence in education has just begun.

## 4.2. Scenario B: Flexible and Collaborative

In 2040, the European social and economic context fosters ongoing **collaboration**, innovation, and a commitment to addressing complex challenges, while promoting equity, inclusivity, and shared responsibility for the education system and the environment. The prevalent educational model, and its approach to presenting instruction and learning experiences to students, is one that prioritises a **flexible approach** based on, among other things, experiential learning, critical thinking, problem-solving, and interdisciplinary learning.

### 4.2.1. Changes in educational policy and system

#### *Cooperative socio-economic approach*

In this scenario, the main strategies for the social and economic development of the education systems follow a cooperative approach. Educational objectives are aligned with broader socio-economic goals, including the promotion of sustainable practices[116] and environmental stewardship. Through collaborative and coordinated efforts among various stakeholders, such as government agencies, educational institutions, non-governmental organisations, and the private sector, a more cohesive and effective approach to tackling educational challenges, and fostering environmental awareness is achieved.

#### *Local communities engage in the decision-making process*

Community engagement in education plays a crucial role in this scenario, with a particular focus on environmental issues. By actively involving local communities in decision-making processes, educational institutions better address the unique needs and concerns of their constituents. This engagement takes various forms, such as community forums, consultations, and collaborative projects, aimed at promoting sustainable practices within the education system, raising awareness of the urgent need for action.

#### *Comprehensive policies promote inclusion*

A key aspect of how education systems deal with societal and civic challenges is the emphasis on inclusion in a wide sense, encompassing not only students in a disadvantaged situation (e.g. disabilities, health problems, economic barriers), but also considering gender, migration backgrounds, refugees, and various minority groups. Inclusion in this context means ensuring that all individuals, regardless of their background or personal circumstances, have equal access to education and the opportunity to participate fully in the learning experience through adaptive and accessible environments, which are created embracing the principles of inclusion. Comprehensive policies aimed at minimising inequity in education are implemented to create a more equitable and just system. These policies address factors, such as socio-economic disparities, cultural differences, and geographic barriers, ensuring that all students have access to high-quality learning opportunities and resources. By addressing the root causes of educational inequity, education systems promote social cohesion, equal opportunities, and personal growth for all learners.

#### *Social harmony in schools*

A key feature in the European education systems is social harmony in schools. This entails fostering an environment where students, teachers, and staff from diverse backgrounds coexist peacefully and respectfully, embracing their differences and working together to create a positive learning atmosphere. The promotion of social harmony in schools not only contributes to a sense of belonging and security, but also encourages the development of empathy, understanding, and tolerance among students. The sense of shared stakeholder ownership, which emphasises inclusive access to political spaces and the use of inclusive methods when engaging with stakeholders, is also central to this scenario. This approach ensures that all voices, including those of marginalised and underrepresented groups, are taken into account when shaping educational policies and initiatives. Through a sense of shared ownership, stakeholders can collectively work

[116] Sustainable practices are methods and approaches that aim to minimize negative environmental, social, and economic impacts while promoting long-term well-being.

towards creating an education system that is more equitable, responsive, and adaptive to the diverse needs of its students, while also prioritising environmental sustainability.

*Strong public funding of school education*

Due to shared understanding of the value of education in the society, school reliance on private expenditure for education is low, thanks to strong public funding of school education. This robust investment in public education ensures that all students, regardless of their socio-economic background, have access to high-quality learning opportunities and resources.

### 4.2.2. Pedagogical approaches and curriculum structure

*Flexible, adaptable, and alternative pedagogical and teaching methods*

In this educational landscape, school education is characterised by its flexibility, adaptability, and the inclusion of alternative approaches to learning. Embracing diverse and innovative methods and non-traditional pedagogies, this future scenario acknowledges the unique needs and preferences of individual students. Emphasis in education shifts from merely accumulating knowledge to developing competences that are integrated across subjects and experiences. Within this educational framework, subjects are no longer confined to rigid silos; instead, they become permeable to one another, allowing for greater interconnections and the development of transversal competences. This comprehensive and interdisciplinary approach ensures that students are exposed to a wide range of perspectives and ideas, fostering a diverse range of skills, such as critical thinking, communication, collaboration, and creativity. Global issues, such as sustainability, are seamlessly integrated across subjects, encouraging students to engage with these pressing matters from multiple angles. Whole school approaches to sustainability education teaching and learning are applied across the majority of schools. Widened concepts of literacy and numeracy, which now include new technologies, environmental issues, social skills, civic engagement, physical and mental health, are achieved using engaging, hands-on teaching methods that actively involve students in the learning process. Teachers employ creative and interactive approaches, such as project-based learning, collaborative activities, and real-world applications, to make these foundational subjects more accessible and enjoyable for learners. These participatory methods not only help students acquire essential skills, but also foster a lifelong love of learning and curiosity about the world around them. In this context, parenting styles tend to be authoritative, striking a balance between setting clear expectations and providing support to help children reach their full potential.

*Integration of new technologies*

A key aspect of this future scenario is digitalisation, which aims to create a technology-rich learning environment that fosters interactive, personalised, and collaborative learning experiences. Schools use interactive digital platforms, online resources, and educational apps, to complement classroom activities, making the learning process more immersive and inclusive. In this scenario, digitalisation is managed through a carefully designed and well-implemented strategy that involves collaboration among school administrators, teachers, students, and parents. Schools have comprehensive technology integration plans in place, developed with input from students, educators, technology specialists, and school leadership. These plans outline the specific goals, objectives, and timelines for incorporating technology into various aspects of teaching and learning. Digitalisation also allows for the incorporation of blended learning, which combines

traditional face-to-face classroom instruction with online and digital learning experiences, as well as learning outside school environments. This approach creates a more interactive, engaging, and personalised educational experience for students. In this context, blended learning follows the flex model, in which online learning is the backbone of student learning, even if it directs students to offline activities at times. Students move on an individually-customised, fluid schedule among learning modalities. The teacher provides face-to-face support on a flexible and adaptive as-needed basis through activities, such as small-group instruction, group projects, and individual tutoring. The integration of new technologies and innovative approaches, coupled with highly engaged teachers, enables blended learning to cater to each student's unique strengths and challenges. Formative assessment methods are utilised to provide timely and constructive feedback, empowering students to take ownership of their learning, and to continuously improve. By promoting the acquisition of these competences through various educational experiences and a commitment to cultivating well-rounded, adaptable, and global-minded students, students are equipped to navigate the challenges and opportunities that life presents, both within and beyond the classroom. Furthermore, social risks associated with digital technology are actively tackled through fully-fledged digital education practices and awareness initiatives. These efforts focus on promoting responsible digital citizenship, addressing issues, such as online privacy, cyberbullying, and digital misinformation. By incorporating digital education and awareness into the curriculum, students are empowered to navigate the digital landscape safely and responsibly, while also leveraging technology to enhance their learning. The role of Ed Tech sector in this scenario is to provide innovative educational technology solutions and services to support the digitalisation and transformation processes by offering a wide range of technology solutions tailored to the specific needs of each school. These solutions may include interactive digital platforms, learning management systems, adaptive learning software, virtual reality tools, and educational apps. Furthermore, the Ed Tech business sector may engage in partnerships and collaborations with the school to continuously refine and improve their products and services, based on feedback and evolving educational needs.

#### *Cooperation to respond to labour market needs*

As a result of strong and ongoing school cooperation with local business and other stakeholders' education also responds to local labour market needs, ensuring that students acquire the skills and knowledge necessary to succeed in their chosen careers, contribute positively to their communities, and skilfully navigate the challenges and opportunities of the modern workforce.

### 4.2.3. Roles and competences of teachers

#### *Teachers are facilitators and mentors*

Teachers have transitioned from being mere content providers, to becoming facilitators and mentors, who foster critical skills in their students. Guided by their expertise and supported by AI, teachers engage learners in thought-provoking discussions and hands-on experiences that encourage the development of essential competencies, such as problem-solving, critical thinking, and collaboration. This shift in the teacher's role empowers students to become active participants in their learning journey. AI plays a significant role in supporting competent teaching staff, who are trained in integrated educational approaches. These teachers are well-versed in interdisciplinary methods, enabling them to draw connections between subjects and nurture a broad understanding of the world for their students. AI serves as an invaluable tool in this context, providing tailored resources, content, and insights, to enhance the teaching process and enable educators

to focus on what they do best. AI not only complements the work of teachers, but also helps reduce their workload. By automating routine tasks, such as grading assignments, tracking student progress, and generating personalised learning plans, AI helps make time for educators to focus on the human aspects of teaching, such as building meaningful relationships with their students and providing individualised support and guidance. This synergy between AI and teachers results in a more efficient and effective educational system that benefits both educators and learners alike.

*No shortages of competent teaching staff*

As a result of the inspiring working environment and comparatively high wages stemming from adequate public financing of education, the teaching profession becomes highly valued and desirable. Competent teaching staff shortage is no longer an issue. In fact, the opposite is true – since active use of AI to aid teachers reduces teacher workload, and, consequently, the number of teachers needed in schools, the demand for teaching jobs well outstrips the number of teaching jobs available.

### 4.2.4. Wild card leading to Scenario B

In the event of and **environmental crisis caused by climate change** in Europe (e.g. rising temperatures fuelling environmental degradation, natural disasters, weather extremes, food and water insecurity, agricultural droughts affecting crops, mass climate migrations), sustainability trends and necessities are integrated into education systems through community environmental awareness, engagement, local action, and cooperation. Accordingly, schools, families, local communities, and other key stakeholders, develop deep structured dialogues and interactions to establish synergies and overcome difficulties. Sustainability education permeates schools' curricula, which are oriented towards green local economies.

### 4.2.5. A day in Scenario B

My name is Marc, and, as I drop my child off at "B" Primary School, I am filled with gratitude for an education system that values and considers the voices of all, including those of marginalised and underrepresented groups. With the goal of inclusion in mind, policies and initiatives ensure that all students have equal access to education, regardless of their background or personal circumstances. For my family, this is of utmost importance, since we are keen to make sure that our daughter's disability does not stop her from leading full a life as possible. "B" Primary actively promotes sustainable practices and environmental stewardship, instilling in our children a deep sense of responsibility and care for the planet. I love seeing how my child is excited about caring for the planet and sustainable practices. It is undeniable that her experiences at school have already transferred to our family's daily routines.

As I attend a community forum organised by the school, I see parents from different walks of life engaging in friendly conversations, united in their commitment to their children's education. I am struck by the collaborative and coordinated efforts among various stakeholders: government agencies, educational institutions, non-governmental organisations, and the private sector come together to tackle educational challenges and raise awareness about environmental issues. Our local community actively participates in the decision-making process, ensuring that the education system reflects the needs and aspirations of the people it serves. It is inspiring to see how our voices are heard and valued, creating a true sense of ownership and collaboration, empowering everyone to contribute to positive change. However, I have to say that it is

not always easy to align all the different positions, and the decision-making process can sometimes take ages.

Inside the school, a diverse and inclusive community thrives. Students, teachers, and staff from different backgrounds coexist peacefully, respecting and embracing their differences. The curriculum is flexible and adaptive, allowing for alternative approaches to learning. Traditional subject boundaries have dissolved, and students explore topics with interdisciplinary perspectives, fostering a wide range of skills, like critical thinking, communication, collaboration, and creativity. Inside the classrooms, I witness a remarkable transformation in the way teachers engage with learners, compared to when I was a student myself. Guided by their expertise and supported by AI, teachers employ engaging, hands-on teaching methods, such as project-based learning and real-world applications, making foundational subjects more accessible and enjoyable. They have transitioned from content providers, to facilitators and mentors, guiding students towards critical thinking and independent learning. While AI plays a significant role in education, "B" Primary actively addresses the social risks associated with digital technology. The curriculum includes fully-fledged digital education practices and awareness initiatives. Students are taught to be responsible digital citizens, learning about online privacy, cyberbullying, digital misinformation, and the ecological impact, due to the huge resource demand of digital technologies. It is reassuring to know that my child is being equipped with the skills to navigate the digital landscape safely and responsibly. The integration of blended learning enriches my child's educational experience. "B" Primary follows the flex model, combining online and offline activities. This approach empowers my child to learn at her pace, while encouraging her to take ownership of her education. When I pick my child up from school, I see her eyes light up with excitement as she shares stories of her day. She tells me about the collaborative projects she worked on, the real-world issues she explored, and the new skills she acquired. In "B" Primary, our children are not just learning facts and figures; they are becoming empathetic, environmentally conscious, and critical thinkers. I am confident that this prepares them for a rapidly changing world, where adaptability and innovation are essential.

At home, I try to strike a balance between setting clear expectations and providing support to help my child reach her full potential. I see my child grow in confidence and enthusiasm for learning, knowing she is in an environment that celebrates her uniqueness and encourages her passions. As I tuck my child into bed, I cannot help but feel grateful for an education system that empowers and supports my child to become the best version of herself despite the challenges she faces. Together, as parents, teachers, and the wider community, we are shaping a brighter and more sustainable future for the next generation.

## 4.3. Scenario C: Standardised and Competitive

In 2040, the European social and economic context fosters **competition** and autonomy of individual actors in educational affairs through independent action. The prevalent educational model and its approach to presenting instruction and learning experiences to students is one that relies on a **standardised, conventional approach** that has been historically prevalent in many school systems.

### 4.3.1. Changes in educational policy and system

#### *Targeted socio-economic approach*

Targeted approaches aim to bridge the existing gaps between different social groups by addressing the root causes of high social fragmentation, such as income inequality and limited access to resources. This phenomenon refers to the division and isolation of different social groups within the school environment, often stemming from factors, such as socio-economic disparities, cultural differences, and diverse educational needs.

#### *The education system tends towards exclusion*

A significant societal and civic challenge in this educational environment is the lack of inclusion for various vulnerable groups, such as students in a disadvantaged situation (e.g. disabilities, health problems, economic barriers), as well as with different gender identities, cultural or ethnic minority backgrounds. The education system tends towards exclusion, which means that certain groups are entirely separated from mainstream education and attend special schools. This practice is in contrast to both inclusion and integration, as it perpetuates the marginalisation of these students, and deprives them of the opportunity to interact with, and learn from, their diverse peers in an inclusive and diverse setting. Students from underprivileged backgrounds struggle to access quality education, leading to an uneven playing field and perpetuating the cycle of inequity. These disparities have long-term consequences on students' academic and professional success, as well as their personal growth and development.

#### *Social fragmentation in schools*

In order to tackle the issue of social fragmentation in schools and promote inclusivity, schools and educational institutions aim for a more inclusive and equitable environment, ensuring that all students have the opportunity to thrive and succeed. However, variable social agreements also emerge, reflecting the diverse perspectives and priorities of different school education stakeholders. These agreements, which relate to issues, such as curriculum content, teaching methods, or resource allocation, vary significantly across communities, regions, or, even, individual schools.

#### *Lack of a lasting consensus on education*

One consequence of the variable social agreements is the lack of a lasting consensus on education. A lasting consensus refers to a stable and enduring agreement among stakeholders about the fundamental principles, values, and objectives of the education system. In the absence of such a consensus, education policies and practices are subject to frequent changes and adjustments, making it difficult for schools and educators to plan for the long term, and ensure continuity in the learning experience. Overarching issues, such as the ongoing environmental crisis, in this context, are not sufficiently addressed, as sustainability issues are tackled only sporadically and only in some communities, regions, and schools. However, the comprehensive approach to undertaking these issues is lacking.

#### *Private funding of school education and shadow education*

Another consequence of the lack of lasting consensus on education, and its socio-economic de-prioritisation, is lack of adequate public funding for the school system. Therefore, one of the key characteristics of this scenario is the widespread prevalence of private funding of school education and shadow education. Private

funding leads to disparities in resources and opportunities among different schools, as institutions with more affluent benefactors may have access to better facilities, technology, and teaching staff. Shadow education, which typically includes private tutoring and supplementary learning opportunities outside of formal schooling, is widespread and exacerbates existing inequalities, as students with access to these additional resources may have an advantage over their peers, who cannot afford such provision.

### 4.3.2. Pedagogical approaches and curriculum structure

#### *Rigid and relatively limited alternative pedagogical and teaching methods*

The prevailing educational system is characterised by relatively limited alternative models of schooling and a rigid structure. The rigidity of the system is further exemplified by the division of knowledge into conventional subjects, each with relatively traditional forms of knowledge, leaving little room for interdisciplinary exploration or flexible approaches to learning. Along the same lines, sustainability education and civic, and citizenship, education are taught as discrete subjects, rather than being integrated into a comprehensive curriculum. This approach limits students' understanding of the interconnectedness of these fields and their relevance to real-world issues. The main emphasis in this educational setting is on the development of technical skills, which involves acquiring practice-driven knowledge about specific subjects and their application. However, there is a limited focus on fostering general competences, which encompass the ability to apply knowledge in various contexts, communicate effectively, and solve problems creatively. Basic skills, such as literacy and numeracy, also do not get adequate attention. Consequently, there is an alarming increase in illiteracy and innumeracy among students. The rise in the inability to read, write, and perform basic mathematical operations poses significant challenges to the development of essential skills, ultimately affecting students' academic and professional prospects in the long term. Within this context, parenting styles often lean towards being uninvolved, adding another layer of complexity to the learning environment.

#### *Uneven uptake of technology*

Unequal embrace of digitalisation means that blended learning is implemented only to a limited extent, in this scenario. Blended learning is implemented following a rotation model, in which students rotate on a fixed schedule between learning modalities, at least one of which is online learning. The students learn mostly on the brick-and-mortar schools, except for any homework assignments. Furthermore, the adoption of personalised learning is scarce, as the system primarily relies on benchmark assessments to measure student performance. This approach to assessment often leads to a narrow focus on learning approaches and may overlook the diverse needs and learning styles of individual students. There are stark differences in adopting blended and personalised learning among public schools and between public and private schools (depending primarily on the disparity of resources available). Furthermore, the school system is vulnerable to external influences from the powerful Ed Tech sector. Due to the differing uptake of digital technologies in schools, the government does not see this as a priority area for potential regulation. Therefore, the presence of the Ed Tech sector in the school system remains largely unregulated and its influence varies from region to region and from school to school.

*Limited relevance of education to the labour market needs*

Due to the focus on technical skills, the relevance of education to the labour market needs is rather limited. The curricula and skills taught in schools align well with the short-term workforce demands, but do not equip students with the competences needed to adapt to the changing labour market demands in the medium to long-term. This also results in a workforce that lacks the necessary skills to drive innovation and economic growth.

### 4.3.3. Roles and competences of teachers

*Teachers face hard challenges*

Teachers struggle to adapt to changing expectations and disparities in resources. As societal and technological advancements continue to reshape the field of education, educators find it difficult to keep up with new methods and practices. This challenge is further exacerbated by the unequal distribution of resources among schools, with some institutions having access to cutting-edge tools and technologies, while others lag behind, due to financial constraints or other limitations. This scenario makes it difficult for educators to effectively manage their classrooms, and provide the necessary support to meet the diverse needs of their students. In this context, the use of AI in schools is unequal, with its implementation primarily focused on the automation of administrative tasks. While AI has the potential to revolutionise teaching and learning by offering personalised instruction and real-time feedback, its current application, in this scenario, is limited. Consequently, the transformative impact of AI on education is not fully realised, as its benefits are not evenly distributed across schools, and its use in the classroom remains largely untapped. There is also limited awareness of digital ethics, inclusion, bias, trust, privacy, transparency, and accountability, particularly within AI. This lack of understanding leaves students and teachers ill-equipped to navigate the complex digital landscape, and make informed decisions about the responsible use of technology.

*Shortage of competent teaching staff is faced diversely*

Due to unfavourable working conditions (including relatively low wages due to lacking public resources), shortage of competent teaching staff and overcrowded classrooms remain an issue. However, this issue affects different schools differently – resource-wise better-off schools and those that apply more innovative approaches to education, including comparatively high uptake of digital technologies, do not face teacher shortages, while, in others, the competent teaching staff shortage is an immense challenge. Competent teaching staff shortages and overcrowded classrooms result in diminished individual attention to students and worsening learning outcomes.

### 4.3.4. Wild card leading to Scenario C

In the event of a **deep economic crisis in the EU** (e.g. a severe economic contraction, depression, or recession that lasts several years, high bankruptcy rates and high unemployment, a breakdown in normal economic activities,s caused by hyperinflation), disparities in resources and opportunities lead to significant inequalities, and very low levels of inclusion and diversity in education. Schools suffer from social fragmentation, there is a shortage of teaching staff and classrooms are overcrowded, student drop-out rates increase rapidly. Targeted socio-economic strategies struggle to deliver universal results, which opens schools to the influence of big Ed Tech companies.

### 4.3.5. A day in Scenario C

My name is Jon and, as I wake up to the sound of my alarm, I can already feel the weight of the day ahead. I am a teacher in "C" Secondary School, which has its fair share of hurdles to overcome. As I arrive at the school, I cannot help but be reminded that our school does not have the same resources that other schools have. Other schools, with more affluent benefactors than "C" Secondary, have access to better facilities, technology, and more teaching staff, while we struggle to make ends meet. It is challenging to keep up with new methods and practices, especially when the availability of resources varies so drastically between schools. Some schools have access to cutting-edge tools and technologies, while others struggle, due to financial constraints. It is a constant battle to provide the best possible education for my students with limited resources at hand.

In our school, we do not have vulnerable groups, such as students with disabilities or migrants. They are left out of mainstream education and directed to special schools. It is disheartening to witness the exclusion of these students, though, given the lack of resources at least in our school, I am not sure if we would be able to accommodate their needs.

The lack of a coherent education policy is another challenge. Frequent changes and adjustments make it difficult for us educators to plan for the long term. We are often left scrambling to adapt to the latest directives, leaving little room for continuity in the learning experience. The ongoing environmental crisis is barely addressed, with only sporadic attempts to tackle sustainability issues. I am doing my best to at least touch upon these topics at my own initiative, but it is hard. Inside the classroom, I am faced with the rigid structure of the system. Knowledge is divided into conventional subjects, each with its own fixed curriculum. There is little room for interdisciplinary exploration or flexible approaches to learning. My students are expected to focus solely on the development of technical skills, leaving little space for creativity or critical thinking. I have to admit that, due to the focus on technical skills development, many of them can find jobs right out of school, but these are usually low-paid and with vague future prospects. I also notice that the ability to read, write, and perform basic mathematical operations is declining among my students. This poses significant challenges to their development of essential skills, affecting their academic and professional prospects in the long term. I often feel like their potential is being hindered by the shortcomings of the education system.

I do not have any meetings today with parents, since many of them seem uninvolved in their children's education, further complicating the already challenging task of engaging students in the learning process. Additionally, the shortage of competent colleagues is an immense challenge, especially in a school that lacks public resources. The environmental crisis and the economic crisis that riddle Europe have enormous impacts on our school. The classrooms are not only overcrowded, but also unbearably hot in summer. Overcrowded classrooms mean diminished individual attention to students, which further worsens learning outcomes. Furthermore, the education processes are sometimes interrupted by extreme events, like last year's flooding, which closed our school for several weeks.

Blended learning is implemented only to a limited extent following a rotation model as our school lacks resources to provide this opportunity to all students. Students rotate on a fixed schedule between learning modalities, with the in-person learning at school being the primary mode of learning, except for homework assignments. All this means a huge workload for us teachers. I feel like I am constantly overworked. The adoption of AI to take over at least some of our tasks probably could be a solution. However, in my opinion,

it is not fully utilised. AI is available in our school, but it is primarily focused on automating administrative tasks, rather than offering personalised instruction and real-time feedback. It is a pity to see the untapped potential of AI, which could greatly benefit students and us educators alike. Despite the challenges, I remain dedicated to my role as a teacher. I strive to create a supportive and inclusive environment, even with limited resources. I want to empower them to become active participants in their learning journey, no matter their background or circumstances. As the day comes to an end, I leave the school reflecting on the uphill battle we face at "C" Secondary. I know that the road ahead is full of obstacles, but I also know that I have a vital role to play in shaping the future of these students.

## 4.4. Scenario D: Flexible and Competitive

In 2040, the European social and economic context fosters **competition** and autonomy of individual actors in educational affairs through independent action. The prevalent educational model and its approach to presenting instruction and learning experiences to students is one that prioritises a **flexible approach** based on, among other things, experiential learning, critical thinking, problem-solving, and interdisciplinary learning.

### 4.4.1. Changes in educational policy and system

#### *Pluralistic socio-economic approach*

In this scenario, the main strategies for the social and economic development of the education systems follow a pluralistic approach. Pluralistic views in the education system are accompanied by a variety of methods to funding, managing, and delivering education services, reflecting the diverse needs of the population.

#### *Social heterogeneity in schools*

Social heterogeneity present in schools brings together students from diverse cultural, ethnic, and socio-economic backgrounds. While these strategies provide flexibility and adaptability, they could also contribute to social fragmentation, if they lead to an uneven distribution of resources, or if they fail to address the varying needs of different communities effectively, such as comprehensive environmental education to prepare students to face the challenges posed by the environmental crisis.

#### *Segregation of people at a disadvantaged situation*

Societal and civic challenges are unevenly addressed, and the educational landscape is marked by the segregation of people in a disadvantaged situation (e.g. disabilities, health problems, economic barriers), and the separation of students based on certain characteristics, like gender, migrant, or minority status, who are often subject to the varying commitments of individual schools. While some schools provide comprehensive support and accommodations for these diverse learners, others do not have the resources, expertise, or inclination to do so. This segregation leads to unequal educational opportunities and outcomes for these students, which further exacerbates existing social and economic disparities. Equity in education is vulnerable to the vagaries of funding, which is often derived from private sources. This reliance on private

funding results in significant disparities in the quality of education provided by schools, as well as the availability of resources and support for different student populations. In some cases, this may lead to underfunded schools struggling to provide a high-quality, inclusive education, while well-funded schools are able to offer a wide array of academic and extracurricular opportunities that cater to diverse learners.

#### *Opaque and variable social commitments to education*

This landscape is also characterised by opaque and variable social commitments to education. This lack of clarity in societal priorities and support for education exacerbates social differences, as it leads to inconsistencies in the availability of resources and the quality of services provided. In some cases, this uncertainty results in the underfunding of essential educational initiatives, including those related to environmental education, further deepening the divide between different communities, and hindering the collective response to the environmental crisis.

#### *Variation in private and public schools funding*

The variation in private and public funding among schools is often determined by their average socio-economic background. Schools in more affluent areas receive substantial private funding, enabling them to offer a wide range of learning opportunities and resources. In contrast, schools in less privileged communities rely more heavily on public funding, which can be limited and result in fewer resources and opportunities for students.

### 4.4.2. Pedagogical approaches and curriculum structure

#### *Pluralised pedagogical and teaching methods*

School education is characterised by a strong degree of pluralisation, featuring a broad range of delivery modes. These include parental and expert tutoring, home-schooling, and supplementary schooling, allowing for diverse learning experiences that cater to the individual needs of students. Interdisciplinary learning is a common and fluid aspect of education in this landscape. It integrates trends and stakeholders' needs across various subjects, fostering an approach to learning that encourages students to make connections between different disciplines. This interconnectedness helps students develop a broader understanding of the world and prepares them to address complex, real-world problems that often transcend the boundaries of individual subjects. Sustainability, civic, and citizenship education play a central role in the lived experience of schooling. These subjects are not only taught as standalone courses, but are also embedded within the broader curriculum and school culture. This approach helps students develop a deep understanding of their roles and responsibilities as global citizens, fostering a strong commitment to environmental stewardship and social justice. Literacy and numeracy outcomes and even their definitions are strongly influenced by individual schools' focus and resources. Some schools prioritise a robust curriculum in these fundamental areas and allocate substantial resources to ensure high-quality instruction, while others place a lesser emphasis on these subjects, resulting in potential disparities in students' literacy and numeracy skills. The acquisition of these foundational skills is crucial for students' academic and professional success, making the uneven distribution of resources and focus a significant concern in this scenario. There is a significant emphasis on the development of technical skills, which are integrated into various subjects. By incorporating these skills throughout the curriculum, students are exposed to practical applications of their learning, and are better prepared for the demands of the modern workforce. This

integrated educational approach enhances students' problem-solving abilities and fosters adaptability and resilience. The focus on both knowledge and competences ensures that students not only gain a deep understanding of their subjects, but also become proficient in putting their learning into practice. This pluralisation is also reflected in parenting styles, which tend to be permissive, enabling children more freedom to explore their interests and learn at their own pace. A key feature of this educational landscape is the great degree of personalisation in teaching and learning. Educators recognise the unique needs, strengths, and learning styles of individual students, and tailor their instruction accordingly. This personalised approach can help bridge some of the divides that might lead to social fragmentation, as it allows educators to address the specific needs of students. Furthermore, this personalisation in some cases extends to environmental education, enabling students to engage with ecological issues in a manner that resonates with their personal interests and values.

### *Access to technology depends on economic resources*

Digitalisation is unequally adopted through the education system. Blended learning is implemented, following an *à la carte* model, to create a more flexible and tailored learning experience. In this model, students take courses entirely online to accompany other experiences at a brick-and-mortar school or learning centre. Students may take courses either face-to-face at brick-and-mortar schools or off-site. This approach allows students to benefit from the best of both worlds: the personal interaction and guidance provided by in-person teaching (including in the out of school environments), and the accessibility of digital resources for self-directed learning and skill development. Personalised learning is also present, with diagnostic assessment playing a crucial role in identifying students' strengths and areas for improvement, enabling educators to provide targeted support and personalise their instruction accordingly. However, the utilisation of these innovative approaches largely depends on the family's and individual school's resources, which result in disparities in access to quality education and the benefits that come with it. Technological awareness among students in this context largely depends on their societal background. Students from more affluent or technologically advanced backgrounds may have greater access to digital devices and resources, as well as opportunities to develop their digital literacy skills. Conversely, students from less privileged backgrounds may face barriers to accessing and utilising technology, which can limit their ability to develop the skills necessary to thrive in an increasingly digital world. While this scenario offers considerable potential for innovation and student development, ensuring equitable access to quality education, and addressing disparities in resource availability, remain key challenges to overcome.

### *Education systems rapidly adapt to labour market needs*

In response to shifting labour market needs, education in this landscape is highly adaptive, with schools and institutions making rapid adjustments to their curricula and instructional approaches to address emerging skill gaps. This adaptability helps to better prepare students for the workforce, ensuring that they have the necessary skills and knowledge to succeed in an ever-changing job market. However, the speed at which educational changes occur also presents challenges, as schools and educators must be prepared to continuously update their practices and resources to keep pace with evolving labour market demands. School openness to external stakeholders is high, fostering the exchange of ideas between the educational community and various sectors of society. However, this openness is often limited to economically relevant sectors, which can lead to an imbalance in the perspectives and interests represented in the educational process.

### 4.4.3. Roles and competences of teachers

*Variability in teachers' roles*

The role of teachers varies greatly among schools, depending on the resources available, and the pedagogical approaches adopted within each educational institution. In some schools, teachers focus on direct instruction and content delivery, while in others, they adopt more innovative, student-centred methodologies that prioritise active learning and critical thinking. This variability in teachers' roles creates diverse learning experiences for students, but it also contributes to disparities in educational outcomes, as the quality of instruction is heavily influenced by the resources and pedagogical approaches employed in each school. In this educational landscape, there is significant fragmentation of teacher training and teacher careers, resulting in a wide variety of educational backgrounds and professional experiences among educators. This fragmentation leads to inconsistencies in the quality of teaching, as well as disparities in the knowledge and skills that teachers bring to their classrooms. A notable development is the increasing use of AI to replace the cognitive aspects of teachers' work. AI-driven tools and platforms are leveraged to automate tasks, such as grading, providing feedback, generating personalised learning plans for students. While these advancements significantly reduce the workload placed on teachers, allowing them to focus on other aspects of their role, such as fostering relationships with students and facilitating meaningful learning experiences, it also raises concerns about the evolving nature of the teaching profession and the potential loss of human touch in education. However, due to varying resource availability, the uptake of AI differs among individual public schools and public and private schools.

*Shortage of competent teaching staff in less affluent schools*

This fragmentation of teacher roles, qualifications, and resources available in individual schools leads to competent teaching staff shortages and overcrowded classrooms in some schools and competent teaching staff oversupply in others.

### 4.4.4. Wild card leading to Scenario D

In the event of a **crisis of public school system** (e.g. teachers decreasing in number and underpaid flee the public system and migrate to private schools), teacher's role varies between schools, based on resources and pedagogical approaches. Accordingly, there is a significant fragmentation of teacher training and teacher careers. AI steps in to replace the cognitive part of teachers' work. School education displays a strong degree of pluralisation with a broad range of delivery modes and engagement commitments of the communities around schools. Equity is vulnerable to vagaries of (usually private) funding.

### 4.4.5. A day in Scenario D

Hi, I am Sandra and I am 16 years old. As I wake up to the vibrating alarm of my smart watch on my wrist, I know it is going to be an exciting day at school. As my teachers love to repeat, "D" Secondary School is a melting pot of cultures and backgrounds, and I am proud to be part of such a diverse community. For one, my best friend's parents come from outside Europe, though she was born here. I enjoy visiting her home for lunch or dinner, as I absolutely love the flavours of their diverse cuisine and it is always fun to listen to their conversations as her parents usually have a very different perspective on things than my own.

As I make my way to school, I pass students of all ages, some walking together, others driven by their parents, while others take the bus. Our school brings together students from different cultural, ethnic, and socio-economic situations, making every day a new learning experience. However, I cannot help but notice that not all students have the same opportunities. Some of my friends and relatives face challenges, due to disabilities, health problems, or economic barriers. They must enrol in special schools. One of my cousins attends such a special school, due to some minor health problems. He tells me how much he wishes he could go to a "normal" school because he feels he is missing valuable educational opportunities, and he is tired of being made fun of for being segregated to a special school. I feel like our school provides comprehensive support and accommodates for all learners, but I know that there are other schools that struggle to do the same, due to limited resources. My parents often say that this results in unequal educational opportunities and outcomes and remind me how lucky I am to be in a "good" school. I know that schools like ours, where most of the students come from well-off families, have enough resources because our parents provide substantial support. However, there are other schools that rely on public funding only, and it looks like it is not always sufficient. I feel like this disparity contributes to social differences within our community.

In the classroom, our teacher begins the day by engaging us in a lively discussion about the impact of plastic waste on marine life. She encourages us to brainstorm solutions and think of ways we can reduce plastic usage at school, home or in our local community. Throughout the day, I notice how the practical application of skills is seamlessly integrated into our lessons. Whether it is solving maths problems, conducting science experiments, or creating artwork, we are always encouraged to apply our knowledge practically. It is empowering to know that what we learn in school directly relates to the real world. In "D" Secondary, interdisciplinary learning is encouraged, fostering a broader understanding of the world. Subjects, like sustainability, civic, and citizenship education, are not just standalone courses, but integrated throughout the curriculum. We are also encouraged to be active participants of our school's community. I am a member of our school's student council, and I am proud to say that we organise a lot of events to raise awareness of the climate change, and mobilise fellow students to solve other issues. It is always good to feel that you are contributing to change in your school community and the world in general. I believe that such participation opportunities nurture our sense of responsibility as global citizens, and inculcates in us a commitment to environmental stewardship. I am thankful that we are constantly encouraged to engage with ecological and other issues in ways that resonate with our interests and values.

I appreciate how our teachers approach our learning process. I feel like our teachers recognise our unique needs and learning styles, tailoring instruction to suit us best. In "D" Secondary, we follow an à la carte model of blended learning, which means that we can take some courses entirely online and others in person. This allows us to have a more flexible and tailored learning experience. I love this approach because it gives me the freedom to explore topics that interest me online, while still enjoying the personal interaction with teachers and other students in the classroom. During breaks, I hang out with my friends, and we discuss the various projects we are working on. Some of us are designing a community garden, while others are working on a recycling campaign. It is incredible to see how our education has nurtured our passion for making a difference in the world. As the school day comes to a close, I head home with a sense of accomplishment and excitement. I know that my parents will support and encourage me, just like my teachers do at school. They trust me to make decisions and explore my interests, which only fuels my desire to learn more. I cannot help but feel grateful for the opportunities I have. I know that not all students are as fortunate, but I hope that one day, every child will have access to a high-quality education and equal opportunities, regardless of their background.

# 5. Scenario implications for the school education in the EU

In discussing the scenario implications for the school education in the EU, we rely on the five dimensions covered in the scenarios.

Section 5.1. aims to:

- identify the key elements within each dimension and provide a short description of their current status.
- describe the preferred developments based on the scenario narratives prioritised by the Scenario analysis focus group participants.

Section 5.2. aims to:

- identify the elements that can be influenced by the Commission's policies and initiatives. As education policy is primarily the responsibility of individual MS, the EC's (specifically DG EAC's) impact on school education is rather limited. Its role is mainly to provide support, coordination, and promotion of MS actions. It encourages cooperation through peer exchanges and proposes solutions to address EU-level challenges.
- undertake a stocktake of existing policy initiatives and measures covering the selected elements. The stock taking considers three key DG EAC policies/initiatives and their related developments – European Education Area (EEA) strategic framework, the Digital Education Action Plan (DEAP), and Erasmus + programme.

The last section (5.3.) of this chapter provides recommendations on improving existing policy initiatives/measures. It also suggests new initiatives/measures to help achieve the preferred scenario developments.

## 5.1. Baseline and preferred scenario developments of elements covered in the scenarios

The dimensions and elements discussed in this section are presented in Figure 18 below.

**Figure 18. Dimensions and elements covered in the scenarios**

| Dimension | Elements |
|---|---|
| **Education policy** | • Education strategy<br>• Stakeholder involvement<br>• Education funding |
| **Education system** | • Socio-economic environment<br>• Educational system type<br>• Inclusion of learners in a disadvantaged situation<br>• Alternative models of schooling<br>• Degree of digitalisation and existing/planned regulation |
| **Pedagogical approaches** | • Pedagogical and teaching methods<br>• Personalised and blended learning<br>• Assessment methods<br>• Parenting styles |
| **Role of teachers** | • Teacher role, competences and working conditions<br>• AI adoption |
| **Curriculum structure** | • Interdisciplinary learning<br>• Sustainability and civic and citizenship education<br>• Skill and competence development<br>• Alignment with labour market needs |

*Source:* Own elaboration.

### 5.1.1. Education policy

#### *Current status*

Education policy in the developed scenarios is described considering three key elements: 1) Overall approach to tackling educational challenges; 2) Degree of different stakeholder involvement; 3) Education funding and resource availability. Each of these elements along with their current status is presented below.

**Education strategy.** *Is the approach to addressing educational challenges integrated, coherent and effective? Is there a consensus concerning the value of education and key goals of the education system? Are educational objectives aligned with broader socio-economic goals?*

At the EU-level, there is a consensus on education policy, with the EC and all MS working together to achieve their collective vision of the EEA by 2025, involving EU-level initiatives in various policy areas, such as blended learning and learning for sustainable development[117]. At an EU-level, these objectives tie in with broader socio-economic goals, with the EEA underpinned by dimensions, including inclusion and gender equality, and the green and digital transitions[118]. However, at the national-level there is wide variation among MS when it comes to achievement of education policy goals. For example, the Joint Research Centre (DG JRC) study on digital education policies in Europe found that there is a substantial variation in how different MS approach digital education policy development. It was found that digital education policies in

[117] European Commission (2022). Building the European Education Area: Progress made on EU-level education targets, challenges remain on equity and teachers' shortages.

[118] European Commission (2020). Achieving a European Education Area by 2025 and resetting education and training for the digital age.

MS vary in the level of comprehensiveness and specificity, their approach to policy development (top-down versus grassroots and collaboration initiatives), and implementation structures (centralised versus decentralised)[119]. Coupled, with the variation in public spending on education by MS (see section on Education funding below), this shows a discrepancy, among MS regarding what kind of education is prioritised (if any), and how educational issues are tackled.

**Stakeholder involvement.** *Are different stakeholders and community representatives involved in education policy formation and implementation?*

Based on 2022 data, the stakeholder involvement in policy and law-making is relatively strong, with 19 MS having late-stage stakeholder engagement for all primary laws, and every MS having late-stage stakeholder engagement for at least major regulations[120]. However, stakeholder involvement is much weaker in the early stages of law making, with no MS having early-stage stakeholder engagement for all regulations, and three MS (Cyprus, Hungary, and Portugal) having no early-stage stakeholder engagement ever[121]. Regarding implementation of educational policy, involvement of stakeholders is becoming more common. [122]. For example, as of 2019, nearly 80% of countries in the OECD have a situation where most schools partner with parents and families, with 60% of countries having similar partnerships with mental health professionals[123].

**Education funding.** *Is the public funding for school education system sufficient? Is the distribution of available resources equitable across the schools?*

Public spending is by far the main source of educational funding, accounting for on average 4.1% of GDP among OECD countries, while private expenditure averages to 0.8% of GDP[124]. Overall, in 2019, private funding accounted for just 10% of expenditure at primary, secondary, and post-secondary non-tertiary levels[125]. However, the distribution of public funding is not equal amongst MS. In the EU, in 2021, public education funding ranged from as high as 6.6% of GDP in Sweden to as low as three percent of GDP in Ireland, with the EU-27 average being 4.8%[126].

### *Preferred scenario developments*

Based on the interactive voting exercise during the Scenario analysis focus group, the preferred scenario developments with regard to education policy are found in the narrative of Scenario B (*Flexible and Collaborative*) (73% of participants would like to see the developments under this scenario materialise). Education policy in this scenario is characterised by:

119 JRC Science for Policy Report (2017). Digital Education Policies in Europe and Beyond.
120 OECD (2022). Better regulation practices across the European Union 2022.
121 Ibid.
122 OECD (2022). Education Fast Forward: Building a future that works for all.
123 Ibid.
124 OECD. Education GPS: Public and Private stakeholders.
125 Ibid.
126 Eurostat (2023). General government expenditure by function (COFOG).

**Figure 19. Preferred scenario developments of education policy**

| Element | Preferred developments |
|---|---|
| **Education strategy** | • shared understanding of the value of education in the society and alignment of educational objectives with broader socio-economic goals;<br>• cohesive and effective approach to tackling educational challenges, and achieving broader socio-economic goals (incl. fostering environmental awareness). |
| **Stakeholder involvement** | • high engagement of local community and stakeholders (e.g. government agencies, educational institutions, non-governmental organisations and the private sector) in policy planning and implementation through community forums, consultations and collaborative projects. |
| **Education funding** | • low school reliance on private expenditure for education, thanks to strong public funding of school education. |

*Source:* Own elaboration.

### 5.1.2. Education system

#### *Current status*

The education system in the developed scenarios is described considering five key elements: 1) Socio-economic environment; 2) Type of education system; 3) Inclusion of learners in a disadvantaged situation; 4) Prevalence of the alternative models of schooling; 5) Degree of digitalisation and regulation. Each of these elements along with their current status is presented below.

**Socio-economic environment.** *Is the socio-economic environment (including in schools) homogenous/heterogenous/collaborative/fragmented?*

One way of presenting the socio-economic environment is through the dominant type of the welfare state and capitalist regime. The types of the welfare state can range from liberal, conservative, and social-democratic (based on the typology provided by Esping-Andersen[127]), to Anglo-Saxon, Bismarckian, Scandinavian and Southern (based on the work of Ferrera[128]), to British, Continental, Nordic, and Southern (based on the typology developed by Bonoli[129]), to name just a few. Other authors notice that not all EU countries can be categorised under the above classic welfare state models, and propose a new extended categorisation of five welfare state models, for example, the Liberal, the Scandinavian, the Conservative, the Southern Europe, and the Eastern Europe[130].The attribution of EU-27 countries to the welfare state type can vary depending on the methodology applied and in time, as policy developments related to welfare state dimensions might cause the change of the type of the welfare state in the country. For example, a group of authors in 2018 based on empirical analysis provide the following clustering of EU-27 countries:

127 Esping-Andersen, G. (1990). The Three Worlds of Welfare Capitalism.

128 Ferrera, M. (1996). The ´Southern` Model of Welfare State in Social Europe. Journal of European Social Policy, 6(1), pp. 17-37.

129 Bonoli, G. (1997). Classifying Welfare States: A Two-dimension Approach. Journal of Social Policy, 26(3), pp. 351-372.

130 Lauzadyte-Tutliene A., Balezentis T., Goculenko E., Welfare State in Central and Eastern Europe, Economics and Sociology, 11(1), 100-23

the Eastern European welfare model (Bulgaria, Estonia, Latvia, Lithuania, Romania), the Central Europe welfare model (Czech Republic, Croatia, Poland, Slovakia, Slovenia, Hungary), the small European states welfare model (Luxembourg, Malta), the Mediterranean welfare model (Greece, Spain, Italy, Cyprus, Portugal), and the old European states welfare model (Austria, Belgium, Denmark, the Netherlands, Norway, France, Finland, Sweden, Germany)[131].

Similarly, a number of different models of capitalism are distinguished. For example, Hall and Soskice distinguishes between coordinated market economies (CMEs) (e.g. Germany, the Netherlands, Belgium, Finland and Austria[132]), and liberal market economies (LMEs) (e.g. US, UK, Canada, Australia, New Zealand, Ireland)[133]. This categorisation was later supplemented with mixed market economies (MME) (by Rhodes and Molina)[134]. Countries, like Greece, Spain, Portugal, and Italy, are usually considered to belong to the MME type[135]. Depending on the overall welfare state and capitalism type, among other things, overall approaches to education and education systems also differ.

**Education system type.** *What type of education system is prevalent?*

The key four types of education systems in the EU-27 are: differentiated branches/tracks (ISCED 2) (Austria, Germany, Lithuania, Luxembourg, Malta, Netherlands), common core curriculum (ISCED 2) (Belgium, Cyprus, France, Greece, Ireland, Italy, Romania, Spain), single structure (ISCED 1+2) (Bulgaria, Croatia, Denmark, Estonia, Finland, Poland, Portugal, Slovenia, Sweden), and a mix (Czechia, Hungary, Latvia, Slovakia)[136]. These categories range from having a single common curriculum that all students follow from beginning to end of compulsory education to having different educational pathways in ISCED 2 and 3, which end in different certificates[137].

Another way to differentiate between the education systems can be seen in Green's (1999) five primary models of E&T systems[138]. Green differentiates between: 1) Japanese model (highly centralised, strong emphasis on group cohesion, general secondary education predominating over vocational secondary education); 2) German model (organised on a regional basis, dominated by the dual system which separates students into different tracks leading to different occupational positions); 3) French model (strong centralisation with comprehensive systems of compulsory schooling, and a school-based system of upper secondary education with a limited apprenticeship system); 4) Swedish model (comprehensive, with a strong emphasis on equality and social cohesion); 5) UK model (based on liberal, individualist philosophy with limited state control and institutional autonomy). Jutta Allmendinger's typology focuses on two dimensions: the standardisation of educational provisions, and the stratification of educational opportunities, where standardisation is the degree to which the quality of education meets the same standards nationwide, and stratification is the proportion of a cohort that attains the maximum number of school years provided by the educational system, coupled with the degree of differentiation within given educational levels (tracking).

131 Ibid.
132 Hall PA. (2014). Varieties of Capitalism and the Euro Crisis. West European Politics, Vol. 37, No. 6, 1223-1243.
133 Hall PA, Soskice D. (2001), Varieties of Capitalism: The Institutional Foundations of Comparative Advantage.
134 Rhodes M. and Molina O. (2007), The political Economy of Adjustment in Mixed Market Economies: A study of Spain and Italy. In B. Hancké, M. Rhodes, and M. Thatcher (eds.). Beyond Varieties of Capitalism. Oxford: Oxford University Press, 223-252.
135 Hall PA. (2014). Varieties of Capitalism and the Euro Crisis.
136 European Commission (2022). The structure of the European education systems 2022/23.
137 Ibid.
138 Green, A. (1999). Education and Globalization in Europe and East Asia: Convergent and Divergent Trends. Journal of Education Policy, 14(1), pp.55-71.

Using this typology, Allmendinger states that West Germany and Norway (secondary) can be seen as examples of high standardisation and stratification, while the USA and Norway (primary) can be seen as examples of low standardisation and stratification[139].

**Inclusion of learners in a disadvantaged situation.** *Are people in a disadvantaged situation or with diverse needs and backgrounds fully integrated into the mainstream education system? Are integration models tailored to individual needs? Are there any groups of students excluded from the mainstream education system?*

In a 2020 UNESCO report, it was found that students in a disadvantaged situation are not fully integrated into the mainstream EU education systems. The percentage of SEN students that are educated in special schools varies widely between MS, from 100% in the Netherlands to just 0.8% in Italy. On average across EU, 31.1% of SEN students attend special schools (or 1.6% of the total student population)[140]. As of 2019, children with a migration background had the same education rights and obligations, as their native-born peers in most European education systems, but in six EU MS (Romania, Sweden, Denmark Bulgaria, Lithuania, Hungary) they did not. In Romania, children from a migrant background, and children with an irregular migration background in Sweden had the right to education, but were not obligated to go to school. In Denmark, asylum seeker children did not have the same right to education as native-born students, and children who are irregular migrants[141] did not have the same rights to education as native-born children in Bulgaria, Denmark, Lithuania, and Hungary.[142] Students from a low socio-economic background are generally not as well integrated into mainstream education as students of different socio-economic backgrounds tend to be sorted into different schools[143]. Socio-economic status is so engrained in education and training systems that learners with low socio-economic status may end up clustered in schools with a concentration of similarly disadvantaged peers.[144] Furthermore, it has been claimed that European education systems often perpetuate inequality, as they do not cater well for students from poorer backgrounds[145]. Regarding students with disabilities, while European Schools are paying increasing attention to inclusion, children with disabilities continued to face problems. They are rejected, pressured into changing schools, or are not provided with appropriate accommodations and support to allow them to learn and thrive in an inclusive environment.[146]

**Alternative models of schooling.** *Are the alternative models of schooling widespread and easily available? Are the alternative models of schooling highly regulated and scarce?*

The traditional public schooling system is still dominant in all EU education systems. Alternative schooling methods, such as forest schools and Waldorf schools, while becoming increasingly common, still make up a minority of all education in the EU. For example, as of 2023, there are 828 Waldorf schools currently in Europe, with 190 000 students (when including all Waldorf schools, including those not represented by the

139 Allmendinger, J. (1989). Educational Systems and Labour Market Outcomes. European Sociological Review, 5(3), pp. 231-250.
140 UNESCO (2020). Global Education Monitoring Report 2020 Inclusion and Education: all means all.
141 Migrants who enter or stay in the country without the necessary authorisation required under immigration regulations and have not submitted a request for asylum. They do not have a legal status in the country.
142 European Commission (2019). Integrating students from migrant backgrounds into schools in Europe.
143 Zwier, D. and Geven, S. (2023). Knowing me, knowing you: Socio-economic status and (segregation in) peer and parental networks in primary school. Social Networks, 74, pp. 127-138.
144 European Commission (2022). Education and Training Monitor 2022 Comparative report.
145 European Commission (2017). Education and training in Europe: inequality remains a challenge.
146 Human Rights Watch (2018). "Sink or Swim" Barriers for Children with Disabilities in the European School System.

national association)[147]. Other forms of alternative education, such as home-schooling, still face restrictions. While a majority of MS authorise home schooling upon request, in 10, it is only authorised in exceptional circumstances (Croatia, Cyprus, Estonia, Germany, Greece, Malta, Netherlands, Romania, Spain, Sweden)[148].

**Degree of digitalisation and existing/planned regulation.** *Is the digitalisation widespread across schools? To what extent is digitalisation in schools regulated? Are the social risks of digitalisation in schools acknowledged and tackled? What is the extent of Ed Tech influence on school education?*

The digitalisation of education is increasingly prevalent across the schools in EU MS. In 2019, 71% of students reported using ICT in more than 25% of their lessons in ISCED 1, with 58% reporting the same in ISCED 2 and 65% in ISCED 3[149]. The COVID-19 pandemic has resulted in more digitalisation in school education. For example, the share of young people who have done an online course increased from 12.9% in 2019 to 27.6% in 2022, even peaking at 34.4% during the pandemic in 2021[150].

Some forms of Ed Tech are more prevalent than others. For example, virtual reality is increasingly penetrating the E&T sector, with a large number of companies already offering services aimed at schools[151]. In 2019, 32% of students in ISCED 1 reported having access to a virtual learning environment (VLE), increasing to 61% of ISCED 2 students and 65% of ISCED 3[152]. The digitalisation was accelerated by COVID-19, during which schools were reliant on Ed Tech provided by private companies. This is still not fully regulated, but steps are already being taken, such as with the EU's AI Act, to ensure that new technologies used in the EU are safe and respect existing law on fundamental rights[153]. Extended reality technology (XR) is also being used more frequently in school education. For example, XR makes language learning more effective, engaging, and accessible, with programmes, such as Gold Lotus, Play2Speak, and Mondly, able to augment teachers' lesson materials. XR is delivered for educational purposes in three main ways: visualisation, virtual field trips, storytelling, and/or annotation[154].

Still, it is becoming increasingly clear that digitalisation in schools poses significant social risks. For example, there are concerns about data privacy and the use of individuals data, and this is currently partially managed by the EU's General Data Protection Regulation (GDPR)[155].

Furthermore, while the availability of fast internet connections and networks in schools is a pre-requisite for being able to use modern IT equipment. Many schools across the EU are still not connected to gigabit internet. The European Commission set a target that all schools should have a high-speed broadband connection by 2025, but this target only aimed for the availability of gigabit connections, not the actual

147 ECSWE (2023). Key numbers on schools and pupils.
148 European Commission, Eurydice (2018). Home Education Policies in Europe. Primary and Lower Secondary Education.
149 European Commission (2019). 2nd Survey of Schools: ICT in Education. Objective 1: Benchmark Progress in ICT in Schools. Final Report.
150 Eurostat. Individuals – internet activities.
151 Marr, B. (2020). Forbes. The Future of Virtual Reality (VR).
152 Ibid.
153 European Commission. Proposal for a Regulation laying down harmonised rules on artificial intelligence (Artificial Intelligence Act).
154 European Commission / DG CNECT (2023). Extended reality: opportunities, success stories and challenges (health, education): executive summary.
155 Serban, A. M. et al. (2020). Social Inclusion, Digitalisation and Young People.

uptake by schools, and as such only a minority of schools (in the five MS surveyed)[156] have access to gigabit internet.[157]

### *Preferred scenario developments*

Based on the interactive voting exercise and discussions with school education stakeholders, during the Scenario analysis focus group, the preferred scenario developments, with regard to educational systems, are found in the narrative of Scenario B (*Flexible and Collaborative*) (60% of participants would like to see the developments under this scenario materialise). The educational system in this scenario is characterised by:

**Figure 20. Preferred scenario developments of education system**

| Element | Preferred developments |
|---|---|
| **Socio-economic environment** | • cooperative socio-economic approach;<br>• social harmony in schools. |
| **Education system type** | • collective work towards creating an education system that is more equitable, responsive, and adaptive to the diverse needs of its students, while also prioritising environmental sustainability. |
| **Inclusion of learners in a disadvantaged situation** | • cultivation of the environment where students, teachers, and other school staff from diverse background coexist peacefully and respectfully, embracing their differences and working together to create a positive learning atmosphere;<br>• focus on all students, regardless of their socio-economic background, having access to high-quality learning opportunities and resources. |
| **Alternative models of schooling** | • educational system is inclusive of alternative approaches to learning and models of schooling. |
| **Digitalisation prevalence and regulation** | • digitalisation widespread across schools;<br>• social risks associated with digital technology actively tackled, through fully fledged digital education practices and awareness initiatives, which are incorporated into curriculum. |

*Source:* Own elaboration.

## 5.1.3. Pedagogical approaches

### *Current status*

Pedagogical approaches in the developed scenarios are described considering four key elements: 1) Pedagogical and teaching methods; 2) Introduction of blended learning; 3) Dominant assessment methods; 4) Dominant parenting styles. Each of these elements along with their current status is presented below.

156 Croatia, Germany, Greece, Italy, Poland.

157 European Court of Auditors (2023). EU support for the digitalisation of schools. Significant investments, but a lack of strategic focus in the use of EU financing by member states. Special Report.

**Pedagogical and teaching methods.** *Are the pedagogical and teaching methods flexible and adaptable? Are the teaching approaches personalised? Are the innovative, interactive and non-traditional pedagogies and teaching methods embraced?*

Based on 2019 data, more traditional teacher-centred learning still dominates in the EU-27. At all ISCED levels, at least six out of 10 students are taught by teachers who frequently engage in presenting, demonstrating, and explaining a topic to the whole class. Some student-centred activities are also regularly implemented by teachers, for example at ISCED 1, nearly 59% of students have teachers who frequently let students discuss ideas with other students and the teacher. However, this is much lower in secondary education, with only 39% and 35% reporting the same at ISCED 2 and 3, respectively[158].

The OECD Teaching and Learning International Survey (TALIS) 2018 results show that there is a reluctance to use more modern pedagogical methods, with only just over half of teachers allowing students to use ICT for projects or class work[159]. When looking specifically at the teaching of science, PISA 2015 highlighted four different methods: enquiry-based science teaching (most frequently found in Denmark, Portugal, and Sweden, least frequently found in Austria, Finland, Netherlands, and Spain), teacher-directed science instruction (predominant in most countries), adaptive instruction in science lessons (most common in Denmark and Portugal and least common in Austria, Belgium, France, Luxembourg, and Slovakia), and feedback in science classes (most common in Bulgaria, least common in Austria, Denmark, Finland, and Germany).

**Personalised and blended learning.** *Is blended learning approach embraced? Which models of blended learning incorporation are prevalent?*

Experts claim that there has been an increase in blended learning, which provides each student with a more personalised learning experience, where students can control time, place, and pace of learning[160]. Blended learning, including lessons outside of school environments, is increasingly common. A 2022 survey of 184 respondents from 25 EU countries[161] found that only four percent of respondents stated that their school involved no outdoor activities at all, with 57.6% stating that learning outside the classroom occurs once a month, 14.7% stating it occurs twice a month, the same percentage stating it occurs three to five times a month, and 8.7% stating it occurs more than five times per month[162].

**Assessment methods.** *Which assessment methods are the most prevalent, e.g. formative, diagnostic, summative, benchmark?*

According to Eurydice data, in 2020, in primary education, assessment is used for summative purposes[163] in 19 out of 27 countries (not in Bulgaria, Germany, Denmark, Greece, Luxembourg, Romania, Sweden,

158 European Commission (2019). 2nd Survey of Schools: ICT in Education. Objective 1: Benchmark Progress in ICT in Schools. Final Report.
159 Ibid.
160 Goldman Sachs (2019). The Future of Learning: Transforming Education in the digital era.
161 This survey is not representative, however more representative data is not currently available.
162 School Education Gateway (2022). Survey on learning outside the classroom – Results.
163 Summative assessment is used to sum up learning at the end of the instructional process and evaluate student performance (e.g. high-stakes test, grading).

Slovakia), and for formative purposes[164] in 24 (not in Austria, Croatia, Slovenia). In secondary education, summative assessment is used in every MS, while formative assessment is used in 22 (not in Austria, Croatia, Luxembourg, Slovenia, Slovakia)[165]. Primary school education in Europe is moving away from grading and instead increasingly focuses on individual feedback, descriptive assessments[166] and reporting, along with more open and collaborative teaching. In secondary education, however, grading is still common to measure student learning either for summative or formative purposes[167].

**Parenting styles**. *Which parenting styles are dominant, e.g. permissive, authoritative, authoritarian, neglectful (or uninvolved)?*

Though comprehensive data on all EU MS is lacking, some *ad hoc* assessments of individual EU countries concerning the dominant parenting styles are available. For example, Swedish adolescents believe that both parents adopt the authoritarian parenting style[168] less frequently than Greek and Italian adolescents. However, adolescents from all three countries believe that the authoritative style[169] is the most often used by both of their parents.[170] A 2019 study on parenting in Spain and Portugal found that in both the authoritarian parenting style was the most common, followed by permissive[171]. In Spain, the neglectful[172] and authoritative styles had a similar frequency, while in Portugal neglectful was a clear third place with authoritative the least common[173].

### *Preferred scenario developments*

Based on the interactive voting exercise and discussions with school education stakeholders, during the Scenario analysis focus group, the preferred scenario developments with regard to pedagogical approaches are found in the narrative of Scenario B (*Flexible and Collaborative*) (57% of participants would like to see the developments under this scenario materialise. Pedagogical approaches in this scenario are characterised by:

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164 Formative assessment provides feedback within the frame of the instructional process and has the potential to provide information on the learning progress of each student (e.g. reflection journals, ongoing portfolios).

165 European Commission, Eurydice (2019). National Education Systems.

166 Providing descriptive feedback aimed at improving student learning following the assessment rather than simply providing a grade.

167 Ibid.

168 Parents of this style tend to have a one-way mode of communication where the parent establishes strict rules that the child obeys. There is little to no room for negotiations from the child, and the rules are not usually explained. They expect their children to uphold these standards while making no errors. Mistakes usually lead to punishment. Authoritarian parents are normally less nurturing and have high expectations with limited flexibility.

169 This type of parent normally develops a close, nurturing relationship with their children. They have clear guidelines for their expectations and explain their reasons associated with disciplinary actions. Disciplinary methods are used as a way of support instead of punishment. Not only can children have input into goals and expectations, but there are also frequent and appropriate levels of communication between the parent and their child. In general, this parenting style leads to the healthiest outcomes for children but requires a lot of patience and effort on both parties.

170 Olivari, M.G. et al. (2015). Adolescent Perceptions of Parenting Styles in Sweden, Italy and Greece: An Exploratory Study.

171 Permissive parents tend to be warm, nurturing and usually have minimal or no expectations. They impose limited rules on their children. Communication remains open, but parents allow their children to figure things out for themselves. These low levels of expectation usually result in rare uses of discipline. They act more like friends than parents.

172 Children are given a lot of freedom as this type of parent normally stays out of the way. They fulfil the child's basic needs while generally remaining detached from their child's life. An uninvolved/neglectful parent does not utilise a particular disciplining style and has a limited amount of communication with their child. They tend to offer a low amount of nurturing, while having either few or no expectations of their children.

173 Parra, A. et al. (2019). Perceived Parenting Styles and Adjustment during Emerging Adulthood: A Cross-National Perspective. Public Health, 16(15), p. 2757.

**Figure 21. Preferred scenario developments of pedagogical approaches**

| Element | Preferred developments |
|---|---|
| **Pedagogical and teaching methods** | • flexible, adaptive, creative and interactive, diverse, and innovative teaching methods, non-traditional pedagogies and alternative approaches to learning (e.g. project-based learning, collaborative activities and real-world application of knowledge) are embraced;<br>• focus on fostering the lifelong love of learning and curiosity. |
| **Personalised and blended learning** | • unique needs, preferences, strengths, and challenges of individual students are acknowledged, personalised learning experiences are ensured;<br>• blended learning, following a flex model, is fully embraced. |
| **Assessment methods** | • formative assessment methods providing timely and constructive feedback to students are prioritised. |
| **Parenting styles** | • parenting styles tend to be authoritative, striking a balance between setting clear expectations and providing support, to help children reach their full potential. |

*Source:* Own elaboration.

### 5.1.4. Role of teachers

#### *Current status*

The role of teachers in the developed scenarios is described considering two key elements: 1) Teacher role, competences and working conditions; 2) AI adoption. Each of these elements along with their current status is presented below.

**Teacher role, competences and working conditions.** *What is the role of teachers in schools and classrooms? Is the role changing or remains stable? What competences are required of teachers? What are the teacher working conditions? Is the pay adequate? Is there a shortage or oversupply of competent teachers?*

The COVID-19 pandemic accelerated the digitalisation of education, and the role of teachers is also transforming, with the help of AI, from expert professionals to coaches and mentors[174]. Tasks that teachers used to perform are being shared among different people and technologies in a process referred to as 'unbundling'. An example of this is the changing role of teachers in assessment, with an increasing amount of student self-assessment meaning teachers are no longer the only ones assessing[175]. In general, schools are transforming from classes, classrooms, and curricula, towards exploring, customisation, and coaching. Through the diversification of education and learning, the term "educator" is evolving, with the learning ecosystem diversifying and teachers taking up new roles[176]. These include new educator roles, such as "edu-vators" (people who explore innovations in the learning sphere), "community intelligence cartographers" (people who map the collective intelligence of their local communities), or "assessment designers" (people who create more appropriate new methods for evaluating learning experiences). Despite this, most teachers

174 Futures Platform (2023). Future of education: AI becomes the teacher while humans mentor and coach.
175 European Commission / DG EAC (2020): Prospective Report on the Future of Assessment in Primary and Secondary Education.
176 European Commission. The Megatrends Hub Competence Centre on Foresight (EC): Diversification of education and learning.

enjoy a high level of autonomy. In 2018, most OECD members had a majority of teachers who agree that they have control over determining course content in their target class, ranging from just under 50% in Portugal to over 95% in Sweden[177].

In terms of teacher competence, in 2021 continuing professional development (CPD) courses were compulsory in 14 of the 20 EU MS, who participated in the OECD study (Austria, Czechia, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Luxembourg, Slovakia, Slovenia, Belgium), compulsory for some teachers/for specific purposes in four (Ireland, Lithuania, Poland, Spain), with no requirement in two (Denmark and the Netherlands)[178]. As a result, the percentage of lower secondary teachers who participated in professional development activities within the last 12 months in 2018 varied among EU MS, from as high as 99.4% in Lithuania to 82.6% in France. The average for the 17 EU MS who participated[179] was 94.4%[180].

There is an issue across Europe of teacher shortages with a majority (17) of EU MS facing a teacher shortage in 2021, five more facing both a shortage and oversupply (Greece, Spain, Italy, Lithuania, Portugal), one facing only an oversupply (Cyprus), and only four (Finland, Malta, Slovakia, Slovenia) not reporting facing any teacher shortage challenges[181]. Overall, around 25% of school principals across the EU report a shortage of qualified teachers[182]. One reason for these shortages is the fact there is an aging teacher population. From 2015 to 2020, the share of teachers in the EU aged 50 and over in lower secondary, upper secondary, and post-secondary non-tertiary education (ISCED 2-4) increased from 32.6% to 40.9%[183]. These shortages are also fuelled by worsening working conditions. For example, in Belgium, Spain, Italy, Portugal, and Romania around 25% of teachers were on fixed-term contracts in 2021. At EU-level, 1 out of 3 teachers below 35, 1 out of 5 in the age group 25-49, and 1 in 10 in the age group 50 and above were on fixed-term contracts with short-term contracts dominating[184]. In 12 education systems, more than 50% of teachers reported experiencing a lot of stress and around 24% and 22% of teachers across the EU reported that their job has a negative impact on their mental and physical health respectively. Around 45% of teachers across the EU also stated that their job does not leave enough time for their personal life[185]. This is all combined with a salary, which is deemed unsatisfactory[186]. While salaries are growing in most education systems, this growth is usually modest or simply index-linked to inflation[187]. Salaries vary widely across Europe, even when adjusted for purchasing power standard (PPS). In terms of annual gross starting salary, in 2020/21, this ranged from as low as roughly €13 000 in Latvia and Bulgaria to as high as over €50 000 in Germany[188].

177 TALIS (2018).
178 OECD (2022). Education at a Glance 2022: OECD Indicators.
179 Austria, Belgium, Czechia, Denmark, Estonia, Finland, France, Hungary, Italy, Latvia, Lithuania, Netherlands, Portugal, Slovakia, Slovenia, Spain, Sweden.
180 Ibid.
181 European Commission / EACEA / Eurydice (2021). Teachers in Europe: Careers, Development and Well-being. Eurydice report.
182 European Commission / DG EAC (2019). Education and Training Monitor 2019.
183 Eurostat. Distribution of teachers at education level and programme orientation by age groups.
184 Ibid.
185 Ibid.
186 Ibid.
187 European Commission (2022). Teachers' and school heads' salaries and allowances in Europe 2020/21.
188 Ibid.

**AI adoption.** *Are teachers supported by AI? What is the extent of AI integration? Which tasks are outsourced to AI?*

Currently, AI is beginning to change by reducing their workload through capabilities, such as the automation of some tasks, such as assessment, plagiarism checking, administration, and feedback[189]. It is also helping with planning, as it receives information on students' backgrounds and assists teachers in deciding on the learning content and approach for the lesson[190]. Examples of AI software include ClassCharts, an automated stating plan tool and behaviour management software, which allows teachers to monitor pupils' achievements and behaviour, while tracking how pupils influence each other. Another example is CENTURY, an adaptive learning platform that makes decisions about the best pathway through learning materials for a specific student, gauging their strengths, weaknesses, and gaps in knowledge[191]. However, AI based feedback is currently unable to meet the demands of teachers. It is reported to be slow, while, more importantly, it is unable to give students personalised and adaptive feedback[192].

### *Preferred scenario developments*

Based on the interactive voting exercise and discussions with school education stakeholders during the Scenario analysis focus group, the preferred scenario developments with regard to the role of teachers are found in the narrative of Scenario B (*Flexible and Collaborative*) (80% of participants would like to see the developments under this scenario materialise). In this scenario, the role of teachers is characterised by:

**Figure 22. Preferred scenario developments of role of teachers**

| Element | Preferred developments |
|---|---|
| **Teacher role, competences and working conditions** | • transition from mere content providers to facilitators and mentors;<br>• empowerment of students to become active participants in their learning journey;<br>• due to extensive adoption of AI, teachers focus less on routine tasks and more on the human aspects of teaching, such as building meaningful relationships with their students, and providing individualised support and guidance;<br>• teachers are trained in integrated educational approaches, well-versed in interdisciplinary methods, can draw connections between subjects and nurture a broad understanding of the world for their students.<br>• due to the inspiring working environment and comparatively high wages, the teaching profession becomes highly valued and desirable;<br>• competent teaching staff shortage is no longer an issue – since active use of AI reduces the number of teachers needed in schools, the demand for teaching jobs well outstrips the number of teaching jobs available. |

189 Baker, T., Smith, L., and Anissa, N. (2019). Educ-AI-tion Rebooted? Exploring the future of artificial intelligence in schools and colleges. Nesta.

190 Celik, I., Dindar, M., Muukkonen, H. et al. (2022). The Promises and Challenges of Artificial Intelligence for Teachers: a Systematic Review of Research. TechTrends 66, 616–630.

191 Ibid.

192 Ibid.

| Element | Preferred developments |
|---|---|
| **AI adoption** | • significant role of AI in supporting competent teaching staff;<br>• AI provides tailored resources, content, and insights to enhance the teaching process, and enable educators to focus on what they do best;<br>• AI helps to reduce teacher workload by automating routine tasks, such as grading assignments, tracking student progress, and generating personalised learning plans. |

*Source:* Own elaboration.

### 5.1.5. Curriculum structure

#### *Current status*

The curriculum structure in the developed scenarios is described considering four key elements: 1) Interdisciplinary learning; 2) Integration of sustainability and civic and citizenship education; 3) Skill and competence development; 4) Adaptability to labour market needs. Each of these elements along with their current status is presented below.

**Interdisciplinary learning.** *Are there interconnections across subjects or are they divided and taught in isolation?*

Content and language integrated learning (CLIL), where subject matters and a foreign language are taught together, is becoming increasingly common, with almost all European countries having introduced it, in some form[193]. Further examples of interdisciplinary learning in the EU include Finland's core curriculum, which focuses on transversal competences that are relevant across the spectrum of all subjects in school curricula. This includes broad topics, such as the European Union, community and climate change, and 100 years of Finland's independence, and these will include multidisciplinary modules on languages, geography, sciences, and economics[194]. Another example is in Sweden, whose school education system is trending towards more pupil-centred methods, topic-based and interdisciplinary teaching, with the curriculum underlining that interaction between different subjects is important.[195]

**Sustainability and civic and citizenship education.** *Are sustainability and civic and citizenship education integrated into the curriculum? Are they integrated as standalone subjects or across different subjects? Are sustainability and civic and citizenship competences developed through the lived experience of schooling?*

More than half of MS[196] have defined, at least partially, competences for environmental sustainability, with this most frequently integrated in primary and secondary education[197]. However, whole-institution approaches where sustainability is embedded in all processes and operations (e.g. teaching and learning, research, campus and buildings management) are not yet widespread, due, in part, to insufficient funding

193 Goris, J. et al. (2019). Effects of content and language integrated learning in Europe. A systematic review of longitudinal experimental studies.

194 European Commission (2019). 10 trends transforming education as we know it.

195 European Commission, Eurydice (2023). National Education Systems: Sweden.

196 Fully present: Bulgaria, Cyprus, Estonia, Greece, Malta, Portugal. Partially present: Austria, Belgium, Czechia, Germany, France, Italy, Latvia, Slovakia.

197 Mulvik I. et al (2021). Education for Environmental Sustainability: Policies and approaches in EU Member States, Final Report.

and institutional support[198]. Environmental sustainability subjects are included in science subjects in all MS, and are covered as a cross-curricular theme in just under half of MS (Austria, Croatia, Cyprus, Czechia, Estonia, Finland, France, Germany, Greece, Sweden, Spain)[199].

Citizenship education is part of the national curricula for general education in all EU MS. In most countries, national curricula tend to be broad in scope covering most of the competences related to democratic and socially responsible action, critical thinking, and inter-personal interactions[200]. Communication skills (69%), civic competences (59%), and social and emotional competences (51%) are being gradually included in student assessment, and are likely to be widely covered by assessment practices across EU-27 in 2030[201].

**Skill and competence development.** *Is enough attention dedicated to developing basic skills? What are the definitions of literacy and numeracy? Are general competences being developed?*

General competences, such as critical thinking and interpersonal competences, are already being taught in schools across the globe[202]. For example, in 2022, 54.5% of students in the OECD (and 52.8% of students in the EU-27) said they were taught how to recognise whether information is subjective or biased at school[203]. However, achievement levels in basic skills are not at the desired level. The share of pupils not reaching basic achievement levels in reading, mathematics, or science was 23%, in 2018, considerably above the EU target of 15%[204]. Furthermore, overall reading and science skills deteriorated between 2009 and 2018[205].

The Council of the EU defines literacy as "the ability to identify, understand, express, create, and interpret concepts, feelings, facts, and opinions in both oral and written forms, using visual, sound/audio, and digital materials across disciplines and contexts. It implies the ability to communicate and connect effectively with others, in an appropriate and creative way[206]." The Council broadens a definition of numeracy into a mathematical competence, which is defined as "the ability to develop and apply mathematical thinking and insight in order to solve a range of problems in everyday situations. Building on a sound mastery of numeracy, the emphasis is on process and activity, as well as knowledge. Mathematical competence involves, to different degrees, the ability and willingness to use mathematical modes of thought and presentation (formulas, models, constructs, graphs, charts)"[207].

198 European Commission / DG EAC (2022). Learning for the green transition and sustainable development: staff working document accompanying the proposal for a Council recommendation on learning for environmental sustainability.
199 European Commission (2022). Education and Training Monitor 2022: Comparative Report.
200 European Commission / EACEA (2018). Citizenship education at school in Europe, 2017.
201 European Commission / European Commission / EACEA / Eurydice (2020). Prospective report on the future of assessment in primary and secondary education.
202 Loble, L. et al. (2017). Future frontiers: Education for an AI world.
203 OECD (2022). Education Fast Forward: Building a future that works for all.
204 Eurydice (2022). Increasing achievement and motivation in mathematics and science learning in schools.
205 OECD (2018). PISA 2018 Results. European Commission / DG EAC (2019). PISA 2018 and the EU – Striving for social fairness through education.
206 Council of the European Union (2018). Recommendation on key competences for lifelong learning.
207 Ibid.

**Alignment with labour market needs.** *Are technical skills required by the labour market taught in schools? Are general competences needed to adapt to changing labour market and innovate taught in schools?*

The link between formal education and work is increasingly broken, with formal education no longer a guarantee for a job[208]. There has already been a decline in the importance formal education credentials (e.g. graduation certificates, degrees) as signals of competence. Young graduates have a harder time than ever to find employment, and the vast majority of those, who do get jobs, do so in completely different fields from what they have studied[209]. One reason for this is a lack of skills demanded in the labour market. In 2019, 40% of European employers reported having difficulty finding people with the skills they need to grow and innovate[210]. There is also a disconnect between employers and educators. Seventy-two percent of educators considered graduates adequately prepared for the job market, while only 40% of employers shared this view. Overall, 25% of youth do not make a smooth transition to work, meaning their first jobs are unrelated to their field of study and they want to change positions quickly[211].

### *Preferred scenario developments*

Based on the interactive voting exercise and discussions with school education stakeholders, during the Scenario analysis focus group, the preferred scenario developments with regard to the curriculum structure are found in the narrative of Scenario D (*Flexible and Competitive*) (56% of participants would like to see the developments under this scenario materialise). In this scenario, the curriculum structure is characterised by:

**Figure 23. Preferred scenario developments of curriculum structure**

| Element | Preferred developments |
|---|---|
| **Interdisciplinary learning** | • interdisciplinary learning is common, students are encouraged to explore interconnections between different disciplines;<br>• focus on developing a broader understanding of the world and preparing students to address complex, real-world problems that often transcend the boundaries of individual subjects. |
| **Sustainability and civic and citizenship education** | • sustainability, civic, and citizenship education play a central role in the lived experience of schooling, these subjects are embedded within the broader curriculum and school culture;<br>• focus on developing a deep understanding of students of their roles and responsibilities as global citizens, and fostering a strong commitment to environmental stewardship and social justice. |

208 European Commission, European Political Strategy Centre (2019). 10 trends transforming education as we know it.
209 Ibid.
210 Ibid.
211 Ibid.

| Element | Preferred developments |
|---|---|
| **Skill and competence development** | • literacy and numeracy outcomes and definitions are strongly influenced by individual schools' focus and resources – some schools prioritise a robust curriculum regarding the development of these skills and allocate substantial resources to ensure high-quality instruction, while others place a lesser emphasis on these competences, resulting in potential disparities in students' literacy and numeracy skills;<br>• significant emphasis on the development of technical skills, which are integrated into various subjects |
| **Alignment with labour market needs** | • by incorporating technical skills throughout the curriculum, students are exposed to practical applications of their learning, and are better prepared for the demands of the modern workforce;<br>• it is ensured that students gain the necessary skills and knowledge to succeed in an ever-changing job market. |

*Source:* Own elaboration.

## 5.2. Progress towards the preferred scenario developments

As discussed above, not all elements covered in the scenario narratives can be influenced by EU policy. Therefore, it is important to identify the elements on which the Commission can have impact. The selected elements are listed in Figure 24 below.

**Figure 24. Scenario elements that can be influenced by the Commission**

| Dimension | Elements |
|---|---|
| **Education policy** | • Education funding |
| **Education system** | • Inclusion of learners in a disadvantaged situation<br>• Degree of digitalisation and existing/planned regulation |
| **Pedagogical approaches** | • Pedagogical and teaching methods<br>• Introduction of personalised and blended learning<br>• Assessment methods |
| **Role of teachers** | • Teacher role, competences and working conditions<br>• AI adoption |
| **Curriculum structure** | • Interdisciplinary learning<br>• Integration of sustainability and civic and citizenship education<br>• Skill and competence development |

*Source:* Own elaboration.

Ongoing Commission policy frameworks and initiatives already address most of the elements listed in Figure 24 above. Below, we provide an overview of the Commission's initiatives related to each scenario element identified as lending itself to the Commission's influence.

### 5.2.1. Education funding

Figure 25 below presents the key recent developments in relation to education funding.

**Figure 25. Key recent developments in relation to education funding**

| Type | Key developments |
|---|---|
| **Fund allocation** | • Erasmus+ programme<br>• Recover and Resilience Facility (RRF)<br>• Cohesion Funds |
| **Working groups** | • Expert group on quality investment in E&T |
| **Research** | • Final report of the expert group on quality investment in E&T<br>• Investing in Education 2023 |
| **Other initiatives** | • Learning Lab on Investing in Quality Education and Training |

*Source:* Own elaboration.

#### *Fund allocation*

Several EU-level E&T funding opportunities are available:

- **Erasmus+ (€26.2 billion for the 2021-2027 period)**[212] is the main education financing programme in the EU. Its three key actions are: 1) learning mobility of individuals, 2) cooperation among organisations and institutions, and 3) support to policy development and cooperation. In 2021-2027, it is focusing on four overarching priorities: 1) supporting the green transition, 2) addressing the digital transformation, 3) promoting the social inclusion and diversity, 4) fostering stronger participation in democratic life, common values, and civic engagement[213].
- **Cohesion Funds (€33.6 billion for the 2021-2027 period)**[214] constantly support educational reforms across the EU.
- **RRF** (€70 billion) provides additional funds for investment in education and skills[215]. These funds are provided as a response to the disruption of the education system, caused by COVID-19[216] .

#### *Working groups*

In May 2021, **expert group on quality investment in E&T was founded**. It aims to pinpoint the policy options that can enhance educational outcomes and inclusiveness, while also increasing the efficiency of spending on E&T.

212 European Commission. What is Erasmus+?
213 European Commission. Erasmus to Erasmus+: history, funding, and future.
214 European Commission (2023). Cohesion funding: €33.6 billion for education, training, and skills.
215 Ibid.
216 Ibid.

*Research*

Two research reports focusing on the efficiency of education funding were recently published:

- In October 2022, **the expert group on quality investment in E&T published its final report.** The report recommends the most economically efficient E&T measures in five key areas: 1) teachers and coaches, 2) digital education, 3) management, 4) infrastructure and learning environments, and 5) equity and inclusion[217]. The report also highlights challenges to enhance the efficiency and effectiveness of education funding:
  - The lack of solid data on the impact of targeted investments on learning outcomes. More evidence is needed.
  - The general need to develop more robust evaluations of national education policies. This includes a need for expertise on evaluation methods among policymakers, and dissemination of findings at EU-level.
- In 2023, the Commission published the report on **Investing in Education**[218]. The report identified a potential new trend in education investment arising from the COVID-19 pandemic.[219]. It highlighted both opportunities and challenges for education investment, emphasising that its future success will depend on its ability to ensure good learning outcomes. The report also acknowledged the complexity of the relationship between education investment and learning outcomes, stating that there is no optimal level of education investments. It concluded by recommending policy experimentation and evaluation in the EU.

*Other initiatives*

In November 2022, **Learning Lab on Investing in Quality E&T** was launched. It is supporting MS to develop evidence-based policy, by strengthening the expertise on rigorous evaluation methods among policymakers and sharing knowledge about properly evaluated policies[220].

### 5.2.2. Inclusion of learners in a disadvantaged situation

Figure 26 below, presents the key recent developments in relation to inclusion of learners in a disadvantaged situation.

217 European Commission / DG EAC (2022). Investing in our future: quality investment in education and training.
218 Ibid
219 Though it is noted that to fully understand if a new composition of public expenditure in the EU has materialised it is necessary to wait until 2025 when expenditure data up to 2023 is available
220 European Commission (2023). Investing in education 2023.

**Figure 26. Key recent developments in relation to inclusion of learners in a disadvantaged situation**

| Type | Key developments |
|---|---|
| **Policy** | • EEA targets<br>• Framework of inclusion measures of the Erasmus+ and the European Solidarity Corps 2021-27<br>• Implementation guidelines of the Erasmus+ and European Solidarity Corps Inclusion and Diversity Strategy<br>• Council conclusions on equity and inclusion in E&T in order to promote educational success for all<br>• Council Recommendation on the Pathways to School Success<br>• Council Recommendation on promoting common values, inclusive education, and the European dimension of teaching<br>• Council Recommendation on improving provision of digital skills in E&T<br>• DEAP |
| **Working groups** | • Working group on "Pathways to School Success<br>• Expert group on "Well-being in schools" |
| **Research** | • Education and Training Monitor 2022 Comparative report |
| **Other initiatives** | • European Toolkit for Schools platform<br>• Erasmus+ Teacher Academies |

*Source:* Own elaboration.

### *Policy*

The inclusion of learners in a disadvantaged situation is being fostered through a number of targeted and broader strategic documents:

- The inclusion of people facing access barriers or having fewer opportunities in E&T is a key objective of the **EEA**[221]. This is evident in targets aimed at reducing the share of low-achieving 15 year-olds in basic skills, reducing the share of early leavers from E&T, and increasing the share of 15-35 year-olds with tertiary educational attainment.
- In the new 2021-2027 programming period, special focus is placed on inclusion, equity and diversity in the Erasmus+ and the European Solidarity Corps programmes. **The framework of inclusion measures of the Erasmus+ and the European Solidarity Corps 2021-27** was developed to remove any obstacles and facilitate access to these programs for people with fewer opportunities[222].
- To support the implementation of the inclusion measures framework, **the Implementation guidelines of the Erasmus+ and European Solidarity Corps Inclusion and Diversity Strategy** were published[223]. Their aim is to help create equitable opportunities of access for everyone to Erasmus+ and Solidarity Corps programmes.

221 European Commission (2020). 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.

222 European Commission (2021). Commission Implementing Decision (EU) 2021/1877 of 22 October 2021 on the framework of inclusion measures of the Erasmus+ and European Solidarity Corps Programmes 2021-2027.

223 European Commission (2021). Implementation guidelines. Erasmus+ and European Solidarity Corps Inclusion and Diversity Strategy.

- In 2021, the Council also published **conclusions on equity and inclusion in E&T in order to promote educational success for all**[224]**.** These provide recommendations for MS and the EC on enhancing equal opportunities and inclusion.
- Another important initiative in relation to inclusion of learners in a disadvantaged situation is **the Council Recommendation on the Pathways to School Success.** It aims to help all pupils reach a baseline-level of proficiency in basic skills, focusing on groups that are more at risk of underachievement and early school leaving[225]. It foresees specific implementation steps to be taken by the MS and EC.
- Council Recommendation on **promoting common values, inclusive education, and the European dimension of teaching,** published in 2018, is also linked with the inclusion of learners in a disadvantaged situation (for more details, see Integration of sustainability and civic and citizenship education section)[226].

Besides initiatives targeted directly at tackling inequalities and promoting inclusion, equal access to E&T is a cross-cutting principle permeating most recent Commission's initiatives. For example:

- **DEAP Action 13** focuses on reducing gender-based inequalities and promotes women's participation in STEM.
- In **the Council Recommendation on improving provision of digital skills in E&T**[227], developed under **DEAP Action 10,** MS are encouraged to identifying 'priority or hard-to-reach groups', and set up measures aimed at reaching them.
- In all its actions DEAP aims to ensure equal access to digital education for all.

### *Working groups*

With the aim of helping the EC in implementing the Council Recommendation on Pathways to School Success, two working groups were established:

- **the working group on "Pathways to School Success"** was established as a sub-group of the Working Group on Schools. It aims to promote mutual learning and the exchange of best practices in topics addressed in the Council Recommendation.
- **expert group on "Well-being in schools"**. The group aims to produce the guidelines focusing on improving well-being in schools by 2024[228].

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224 Council of the European Union (2021). Conclusions on equity and inclusion in education and training in order to promote educational success for all.

225 Council of the European Union (2022). Council Recommendation on Pathways to School Success and replacing the Council Recommendation of 28 June 2011 on policies to reduce early school leaving.

226 Council of the European Union (2018). Council Recommendation of 22 May 2018 on promoting common values, inclusive education, and the European dimension of teaching.

227 Council of the European Union (2023). Proposal for a Council Recommendation on improving the provision of digital skills in education and training.

228 European Commission (2022). Commission Expert Group on well-being in schools.

### *Research*

Two research reports focusing on the inclusion of learners in a disadvantaged situation were recently published:

- A thematic report on "Blended learning for inclusion: exploring challenges and enabling factors"[229] was published by the working group on "Pathways to School Success";
- **Education and Training Monitor 2022** Comparative report focused on inequity in education as a cross-cutting theme proposing a new synthetic indicator providing more insights on the roots of inequity in education[230].

### *Other initiatives*

The key other initiatives related with the inclusion of learners in a disadvantaged situation are:

- EC support for provision of new guidance material and resources, which are published on **European Toolkit for Schools platform**[231].
- Projects, focused on increasing teacher competences in inclusive education, financed through **Erasmus+ Teacher Academies** (For more details see Teacher role, competences and working conditions section).

## 5.2.3. Degree of digitalisation and existing/planned regulation

Figure 27. below, presents the key recent developments in relation to the degree of digitalisation and existing/planned regulation in school education.

**Figure 27. Key recent developments in relation degree of digitalisation and existing/planned regulation in school education**

| Type | Key developments |
|---|---|
| **Policy** | • DEAP<br>• Proposal for a Council Recommendation on the key enabling factors for successful digital E&T<br>• Proposal for a Council Recommendation on improving provision of digital skills in E&T<br>• Guidelines to help teachers and educators promote digital literacy and address disinformation through E&T |
| **Working groups** | • Expert Group on Tackling Disinformation and Promoting Digital Literacy Through E&T<br>• DELTA (Digital Education Learning Teaching and Assessment) working group |

229 European Commission (2022).). Pathways to School Success..
230 European Commission (2022). Education and Training Monitor 2022: Comparative Report.
231 School Education Gateway (2021). Toolkits for Schools.

| Type | Key developments |
|---|---|
| **Research** | • Final report of the Commission Expert Group on Tackling Disinformation and Promoting Digital Literacy Through E&T<br>• Study to facilitate the development of a European Digital Education Content Framework<br>• JRC report "Reviewing computational thinking in compulsory education"<br>• Eurydice study on "Informatics education at school in Europe"<br>• European Court of Auditors special report on EU support for the digitalisation of schools. |
| **Other initiatives** | • Stakeholder dialogue process on a European Digital Education Content Framework<br>• Erasmus+ cooperation projects<br>• SELFIE<br>• SELFIE for TEACHERS<br>• Erasmus+ Teacher Academies<br>• financially support for MS and third countries to participate in International Computer and Information Literacy Study (ICILS)<br>• Girls Go Circular Project<br>• Digital SALTO resource centre (Support Advanced Learning and Teaching Opportunities) |

*Source:* Own elaboration.

### *Policy*

Several policies supporting digitalisation and provision of digital competences in E&T are in place:

- DEAP 2021-2027 is the key initiative consolidating all Commission's efforts in the field of digital education. Through a number of actions, it aims to help the E&T systems of MS adapt to the digital age.
- Under **Action 1,** the structured dialogue on digital education and skills was launched in October 2021. This involved EU-level discussions and bilateral meetings between the EC and individual EU countries. The dialogue process resulted in two proposals made in April 2023 for:
- **Council Recommendations on the key enabling factors for successful digital E&T**[232] (corresponds to Action 1 in DEAP).
- **Council Recommendation on improving provision of digital skills in E&T**[233] (corresponds to Action 10 in DEAP).
- Under **Action 7** the **guidelines** developed by the Commission with the support of the Expert Group on Tackling Disinformation and Promoting Digital Literacy were published in 2022, **to help teachers and educators promote digital literacy and address disinformation through**

[232] European Commission (2023). Proposal for a Council Recommendation on the key enabling factors for successful digital education and training {SWD(2023) 205 final}.https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52023DC0205

[233] Council of the European Union (2023). Council Recommendation on improving the provision of digital skills in education and training.

**E&T**[234]. These guidelines provide teachers and educators practical support for teaching digital literacy.

### *Working groups*

With the aim of supporting EC in implementation of DEAP, two working groups were established:

- the Commission **Expert Group on Tackling Disinformation and Promoting Digital Literacy Through E&T** was set up in 2021 (under DEAP Action 7). Its aim was to produce a final report on digital literacy and disinformation providing recommendations for teachers, educators, and policymakers, and support the Commission in developing the guidelines to help teachers and educators promote digital literacy and address disinformation through E&T.
- **DELTA (Digital Education Learning Teaching and Assessment) working group**. Its aim is to offer a forum of exchanges and peer learning in the frame of digital education policy aspects.

### *Research*

Several research reports focusing on the degree of digitalisation of school education and existing/planned regulation were recently published:

- **Final report** of the Commission Expert Group on Tackling Disinformation and Promoting Digital Literacy Through E&T **on digital literacy and disinformation published in 2022**[235]. It provided 47 recommendations for teachers, educators and policymakers at the European-, national-, and regional-levels.
- **Study to facilitate the development of a European Digital Education Content Framework** launched in 2022 aiming to take into account the needs of learners, educators, and relevant E&T stakeholders, and the supply of digital education content. It is also assessing the impact of the COVID-19 pandemic, digital transformation, and technological innovation on education.[236]
- JRC report, published in 2022, **"Reviewing computational thinking in compulsory education"**[237]. It provided recommendations on consolidating understanding of computational thinking (CT), ways of integration of CT skills in the curriculum, support for teachers and policy support for implementing CT.
- the **Eurydice study on "Informatics education at school in Europe",** published in 2022. The report provided an overview of the subjects that included learning outcomes related to informatics throughout primary and secondary education in 37 European countries[238].

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234 European Commission / DG EAC (2022). Guidelines for teachers and educators on tackling disinformation and promoting digital literacy through education and training.

235 European Commission / DG EAC (2022). Final report of the Commission expert group on tackling disinformation and promoting digital literacy through education and training – Final report.

236 European Commission (2022). Education professionals: help us shape the European framework for digital education content.

237 JRC (2022). Reviewing Computational Thinking in Compulsory Education: State of play and practices from computing education.

238 Eurydice (2022). Informatics education at school in Europe.

- **European Court of Auditors special report on "EU support for the digitalisation of schools",** published in 2022. The report assessed actions financed from the EU budget in support of digital education in schools, assessing whether targets have been met, such as regarding internet connectivity for schools[239].

### *Other initiatives*

The key other initiatives related with the degree of digitalisation and existing/planned policy are:

- **intensive stakeholder dialogue process on the European Digital Education Content Framework** (under DEAP Action 3), to ensure that all actors feel ownership of the proposed solutions, and that their full implementation is achievable. The EC is putting this process in place throughout 2022 and 2023. The aim is to identify areas in which EC action would bring added value and to work closely with stakeholders to find the most effective solutions.
- funding opportunities **for Erasmus+ cooperation projects**, focusing on digital planning including in the area of school education, as part of the Erasmus+ general call (under DEAP Action 5). This funding is made available annually under the Erasmus+ annual general call until 2027[240] to support the digital transformation plans of E&T institutions.
- school self-assessment tool **SELFIE** launched in 2017. It is a free online tool to help schools embed digital technologies into teaching, learning, and assessment. It anonymously gathers the views of students, teachers, and school leaders on how technology is used in their school. Based on this input, the tool generates a report of a school's strengths and weaknesses in their use of technology.[241]
- teacher self-assessment tool **SELFIE for TEACHERS** launched in 2021. It is a free online self-assessment tool help teachers develop their digital skills. It provides automatic feedback report with results and tips for next steps, and, as of January 2023, had over 100 000 users[242] (for more details, see Teacher role and competence section).
- financial support for **MS and third countries associated with Erasmus+ to participate in International Computer and Information Literacy Study (ICILS) 2023** (under DEAP Action 11). Using the data from ICILS, progress towards the EU-level target on students' digital skills (reduction of low-achieving eighth graders in computer and information literacy to below 15% by 2030) will be monitored, with the main data collection occurring throughout 2023, publication of the results expected in late 2024 and the release of the ICILS 2023 database in early 2025.
- **Girls Go Circular Project** (implemented under DEAP Action 13) aims to equip 40 000 [243] aged 14-19 across Europe with digital and entrepreneurial skills by 2027, through an online learning

239 European Court of Auditors (2023). EU support for the digitalisation of schools. Significant investments, but a lack of strategic focus in the use of EU financing by member states. Special Report.
240 European Commission. Digital Education Action Plan – Action 5.
241 European Commission. SELFIE: A tool to support learning in the digital age.
242 European Commission (2023). SELFIE for Teachers?
243 European Commission. Digital Education Action Plan – Action 11,

programme about the circular economy. As of 2023, over 26 000 girls have been supported in this project in over 1 000 schools[244].

- **Digital SALTO resource centre (Support Advanced Learning and Teaching Opportunities)** established with the aim of helping to improve the quality and impact of the Erasmus+ programme in relation to the digital education priorities through its different actions. This has held various policy awareness webinars and an Erasmus+ and ESC National Agencies Digital contact points' meeting focusing on digital transformation priority, as reflected at the EU policy-level and how it is translated in the programme priorities' narrative and actions.[245]

### 5.2.4. Pedagogical and teaching methods

Figure 28 below, presents the key recent developments in relation to pedagogical and teaching methods.

**Figure 28. Key recent developments in relation to pedagogical and teaching methods**

| Type | Key developments |
|---|---|
| **Policy** | • Handbook "Blended learning for high quality and inclusive primary and secondary education" |
| **Other initiatives** | • European Innovative Teaching Award initiative<br>• Erasmus+ Teacher Academies |

*Source:* Own elaboration.

#### *Policy*

A flexible approach to teaching and learning is promoted in the Commission's 2021 handbook "**Blended learning for high quality and inclusive primary and secondary education".** It states that there is a strong connection between the pedagogical and organisational principles associated with competence-based education and a blended learning approach, as both require a flexible approach to teaching and learning that moves away from the concept of the educator as the single 'knowledge authority', and allows the use of a variety of learning approaches to scaffold the progression and growing independence of each learner according to their strengths, needs, and interests[246].

#### *Other initiatives*

The key other initiatives related with the pedagogical and teaching methods are:

- **European Innovative Teaching Award initiative,** launched in 2021. It highlights innovative teaching and learning approaches, which address new challenges posed to E&T across Europe by a rapidly evolving world. One of its core aims is to identify and promote outstanding teaching and learning practices. The award focuses on school education (primary and secondary), and includes ECEC and VET schools. As of now, the innovative and learning approaches were highlighted within two themes:

244 Girls go Circular (2023). Digital and Entrepreneurial Skills for Circular Economy.

245 European SALTO Digital Resource Centre

246 European Commission / DG EAC (2021). Blended learning for high quality and inclusive primary and secondary education: a handbook.

- In 2021, the theme was **distance/blended/hybrid learning**, celebrating projects that used distance learning alongside teaching practices and related digital tools and other forms of blended learning, to provide effective and inclusive education. Overall, 104 projects received the award across four categories: ECEC, primary education, secondary education, and VET schools. In the primary education category, 29 school projects were granted the award, where numerous initiatives have paved the way for new teaching methodologies. In the secondary education category, 31 school projects were chosen which have stood up for their innovative learning and teaching approaches[247].
- In 2022, the theme was **Learning Together, promoting creativity and sustainability**. Overall, 98 projects received the award across the four categories. In the primary education category, 26 school projects were granted the award, while in the secondary education category 27 school projects were chosen[248].
- Projects related to innovative teaching methods funded as part of the **Erasmus+ Teacher Academies** initiative, as well as under the **Partnerships for Cooperation action** of the programme. One of the academies receiving funding in 2023 through the Erasmus+ Teacher Academies initiative is the Academy for creative, innovative, and inclusive schools (ACIIS), which is a network promoting innovative teaching methods, using drama techniques and drama digital tools, as a means to improve and support inclusive education and development. ACIIS will bring together 87 teachers from school lab teams at pilot training courses, and 81 teachers – newcomers at international training courses. These will then incorporate new teaching strategies and ICT drama tools into their teaching practice. It will also train 75 teacher trainers, who will then incorporate the innovative pedagogies into their own training courses providing training to up to 1125 teachers during the lifetime of the project[249].

### 5.2.5. Personalised and blended learning

Figure 29 below, presents the key recent developments in relation to personalised and blended learning approaches.

**Figure 29. Key recent developments in relation to personalised and blended learning**

| Type | Key developments |
|---|---|
| **Policy** | • Council Recommendation on blended learning<br>• Handbook "Blended learning for high quality and inclusive primary and secondary education" |
| **Working groups** | • Working Group on Schools (Pathways to School Success sub-group) |
| **Research** | • Report on blended learning by the working group on "Pathways to School Success" |
| **Other initiatives** | • European Innovative Teaching Award initiative |

*Source:* Own elaboration.

247 European Commission. The European Innovative Teaching Award 2021.
248 European Commission. European Innovative Teaching Award.
249 European Commission (2023). 16 new Erasmus+ Teacher Academies to promote excellence in teacher education in Europe.

### *Policy*

Two key policy initiatives focusing on personalised and blended learning are in place:

- **Council Recommendation on blended learning** adopted in 2022 (under DEAP Action 2), focusing on the priority areas of inclusive school education, competence development, and support for teachers and school leaders. This included both shorter-term measures to address the most pressing challenges and inequalities exacerbated by the COVID-19 pandemic, while also aiming to achieve longer-term preparedness, by blending learning environments and tools in primary and secondary E&T[250].
- **handbook "Blended learning for high quality and inclusive primary and secondary education"** (including a framework of blended learning) was published, with an aim of helping stakeholders understand the full potential of blended learning and support real and positive change across educational systems and across Europe[251]. These efforts to promote blended learning also help to embed flexible and adaptable learning practices (for more details, see Pedagogical and teaching methods section).

### *Working groups*

As part of its activities, the **Working Group on Schools (sub-group on Pathways to School Success),** held a seminar in March 2022, where representatives from EU Member States' education ministries and stakeholder organisations discussed the pedagogical value of blended learning for enhancing inclusion, and the related evolving role of teachers[252].

### *Research*

The **Working Group on Schools (sub-group on Pathways to School Success)** also published a report on blended learning in 2023. In this, they provided recommendations for EU-level policymakers, country-, regional-, and/or local-level policymakers and school leaders on supporting blended learning[253].

### *Other initiatives*

Among the key other initiatives related to promotion of personalised and blended learning, the first **European Innovative Teacher Award**, which, as mentioned above in the section Pedagogical and teaching methods, in 2021, had the theme of distance/blended/hybrid learning can be mentioned[254].

250 Council of the European Union (2021). Council Recommendation of 29 November 2021 on blended learning approaches for high-quality and inclusive primary and secondary education 2021/C 504/03 (Council Recommendation on Blended Learning).
251 European Commission / DG EAC (2021). Blended learning for high quality and inclusive primary and secondary education.
252 European Commission. Inclusive blended learning: EU working group on schools seminar.
253 European Commission, Working Group on Schools (2021-25) Pathways to School Success (2023). Blended learning for inclusion: exploring challenges and enabling factors.
254 European Commission. The European Innovative Teaching Award 2021.

### 5.2.6. Assessment methods

Figure 30 below presents the key recent developments in relation to assessment methods.

**Figure 30. Key recent developments in relation to assessment methods**

| Type | Key developments |
|---|---|
| **Research** | • Recommendations of the working group on "Pathways to School Success" on inclusive approach to the formative assessment of school learners<br>• Prospective report on the future of assessment in primary and secondary education |

*Source:* Own elaboration.

#### *Research*

Several research reports focusing on the assessment methods in school education were recently published:

- Recommendations of the **Working Group on Schools (sub-group on Pathways to School Success)** on the inclusive approach to formative assessment of school learners. It is expected that these recommendations will be included as part of a broader thematic report and factsheets to be published in 2023.
- **Prospective report on the future of assessment in primary and secondary education** published by EC in 2020. This outlined how assessment may look in the EU by 2030 and made a series of policy recommendations for MS and the Commission[255].

### 5.2.7. Teacher role, competences and working conditions

Figure 31 below, presents the key recent developments in relation to teacher role, competences and working conditions.

**Figure 31. Key recent developments in relation to teacher role, competences and working conditions**

| Type | Key developments |
|---|---|
| **Policy** | • Council conclusions on European teachers and trainers for the future<br>• Council conclusions on enhancing teachers' and trainers' mobility, in particular European mobility, during their initial and in-service E&T<br>• Investing in career guidance |
| **Other initiatives** | • Erasmus+ Teacher Academies<br>• Job shadowing or training courses funded by Erasmus+ under the Mobility action<br>• Partnerships for Cooperation projects |

*Source:* Own elaboration.

[255] European Commission, DG EAC (2020). Prospective report on the future of assessment in primary and secondary education,

### *Policy*

There is a recognised need to counter the issue of teacher shortages and to make the profession more attractive. In relation to this need, several key policy initiatives are in place:

- **Council conclusions on European teachers and trainers for the future.** The conclusions recognise that teachers at all levels and in all types of E&T are an indispensable driving force of E&T. They have a crucial role in preparing individuals of all backgrounds and ages to live, learn, and work in the world of today, as well as in creating and leading future changes. It is further recognised that in the context of continuous social, demographic, cultural, economic, scientific, environmental, and technological changes, the world of E&T is also changing. This includes teacher and trainer professions manifesting in increasing demands, responsibilities, and expectations. Within this context, the recommendations to MS for tackling the above issues are provided[256].
- **Council conclusions on enhancing teachers' and trainers' mobility, in particular European mobility, during their initial and in-service E&T**, placing European mobility as beneficial to teacher and trainer E&T. It recommends that MS take specific actions to enhance teachers' and trainers' mobility[257].
- **Investing in career guidance,** published in 2021. It aims to support the career progression of school education professionals and outlines the benefits of career guidance and provides advice on how to run a well-functioning career guidance system[258]. The EC also supports and coordinates the Euroguidance Network, providing national resources and information centres for guidance in 34 European countries[259].

### *Other initiatives*

To better support the competence development and career paths of teachers, trainers, and school education leaders, and to support the attractiveness of the education profession, the Commission has launched various initiatives:

- **Erasmus+ Teacher Academies** project was launched in 2021, to create networks of teacher education institutions and teacher associations. They aim to create European partnerships and promote cooperation between teacher education institutions and training providers, with the aim of offering support for teachers at the beginning of their career and strengthen their professional development. The goal was to support the creation of 25 Teacher Academies by 2025[260], and, as of 2023, this goal has already been exceeded with 11 academies funded in 2022 (awarded a total of €15 million over three years), and 16 in 2023[261].
- **European innovative teaching award** highlighting the best practice teaching examples also contributes to teacher learning (for more details, see Pedagogical and teaching methods section).

256 Council of the European Union (2020). Council conclusions on European teachers and trainers for the future (2020/C 193/04).
257 Council of the European Union (2022). Council conclusions on enhancing teachers' and trainers' mobility, in particular European mobility, during their initial and in-service education and training.
258 CEDEFOP, European Commission, ETF, OECD, UNESCO (2021). Investing in Career Guidance: Revised Edition 2021.
259 Euroguidance (2022). About us.
260 European Commission, Erasmus+ Teacher Academies.
261 European Commission (2023). 16 new Erasmus+ Teacher Academies to promote excellence in teacher education in Europe.

- opportunities for job shadowing or **training courses funded by Erasmus+ under the Mobility action**. These are tailored for teachers, headmasters, and other school, university, and adult education staff on the topics of soft skills and class management, ICT, and new technologies, inclusion and diversity, innovative teaching methods, preschool teaching methods, and languages, and EU projects design. The 2023-24 catalogue lists 35 one week-long courses, and participants are eligible to receive an Erasmus+ grant, covering all the training course costs including travel, board and lodging, and course fee[262].
- teacher competences are also developed through the **Partnerships for Cooperation projects,** where schools can come together and work on a particular theme (for example digital pedagogies), in relation to teachers' practices find solutions and propose innovative approaches and best practices.

### 5.2.8. AI adoption

Figure 32 below presents the key recent developments in relation to AI adoption in school education.

**Figure 32. Key recent developments in relation to AI adoption in school education**

| Type | Key developments |
|---|---|
| **Policy** | • Ethical guidelines on the use of AI and data in teaching and learning for educators<br>• Update to the Digital Competence Framework, DigComp 2<br>• Commission proposal for the AI regulation act |
| **Working groups** | • Commission Expert Group on AI and Data in E&T |

*Source:* Own elaboration.

#### *Policy*

DEAP also underpins the majority of DG EAC's work in AI adoption. Several key policy initiatives in relation to it are in place:

- **Ethical guidelines on the use of AI and data in teaching and learning for educators,** developed in October 2022 (under DEAP Action 6). These guidelines outline AI and data use examples within education and provides a series of guiding questions for educators, which are based on the key requirements for trustworthy AI systems and serve the purpose of enabling constructive dialogue on their ethical use in E&T. These guiding questions cover the following topics: 1) Human Agency and Oversight, 2) Transparency, 3) Diversity, non-discrimination and Fairness, 4) Societal and Environmental Well-being, 5) Privacy and Data Governance, 6) Technical Robustness and Safety, 7) Accountability[263].
- update to the **Digital Competence Framework, DigComp 2.2** (under DEAP Action 8), published in 2022, to include skills, knowledge, and attitudes, related to AI and the use of data. It includes an appendix with more than 70 examples that can help citizens to better understand where and in

[262] Erasmus Training Courses 2023.

[263] European Commission / DG EAC (2022). Ethical guidelines on the use of artificial intelligence (AI) and data in teaching and learning for educators.

which situations in their everyday life, they can expect to encounter AI systems. It also addresses AI extensively under Dimension 1: Information and Data Literacy[264].

- Proposal on the AI regulation act made by the EC in 2021. This will be the world's first comprehensive AI law. The Commission aims for an agreement on the final form of the law by the end of 2023. In the education sphere, this will require AI systems involved in education and VET to be registered in an EU database. AI systems considered a threat to people will be banned, such as those using real-time and remote biometric identification systems, social scoring, and cognitive behavioural manipulation of people[265].

### *Working groups*

**The Commission Expert Group on AI and Data in E&T,** established in 2021, supported the EC in developing the guidelines on the use of AI and data in teaching and learning for educators.

## 5.2.9. Interdisciplinary learning

Figure 33 below presents the key recent developments in relation to interdisciplinary learning in school education.

**Figure 33. Key recent developments in relation to interdisciplinary learning in school education**

| Type | Key developments |
|---|---|
| **Policy** | • Council recommendation on learning for the green transition and sustainable development<br>• Council recommendation on improving provision of digital skills in education and training |

*Source:* Own elaboration.

### *Policy*

A shift to interdisciplinary learning is recognised as being important for education, as modern-day challenges are complex and interlinked, therefore, requiring interdisciplinary thinking. In relation to this, two key policy initiatives are in place:

- **The 2022 Council recommendation on learning for the green transition and sustainable development** recommends that MS facilitate learning methods and approaches that are collaborative and support interdisciplinary and cross-curricular activities, support educators in adopting pedagogies that enhance teaching and learning for the green transition and sustainable development in interdisciplinary ways, and encourage and enable transformative and interdisciplinary teaching and learning, using both traditional and innovative learning approaches[266].

264 European Commission (2022). DigComp 2.2: The Digital Competence Framework for Citizens – With new examples of knowledge, skills, and attitudes.

265 European Parliament (2023). EU AI Act: first regulation on artificial intelligence.

266 Council of the European Union (2022). Council Recommendation of 16 June 2022 on learning for the green transition and sustainable development.

- **The 2023 Council recommendation on improving provision of digital skills in education and training** recommends that MS should expand the cross-curricular approach (i.e. digital skills taught transversally in different subjects), ensure cross-curricular assessment of digital skills, and address barriers to the cross-curricular approach, by providing quality training on the use of digital pedagogy in teachers' ITE and CPD[267].

### 5.2.10. Sustainability and civic and citizenship education

Figure 34 below presents the key recent developments in relation to sustainability and civic and citizenship education in school education.

**Figure 34. Key recent developments in relation to sustainability and civic and citizenship education in school education**

| Type | Key developments |
|---|---|
| **Policy** | • Council recommendation on learning for the green transition and sustainable development<br>• GreenComp: The European sustainability competence framework.<br>• Council recommendation on promoting common values, inclusive education, and the European dimension of teaching |
| **Working groups** | • Working Group on Schools (Learning for sustainability sub-group) |
| **Other initiatives** | • Education for Climate Coalition<br>• 2021-27 Erasmus+ Programme<br>• Erasmus+ Teacher Academies<br>• SALTO Resource Centres<br>• Council of the European Union Civic education package for teachers<br>• New European Bauhaus |

*Source:* Own elaboration.

#### *Policy*

Regarding sustainability and civic and citizenship education, several key policy initiatives are in place:

- The 2022 **Council Recommendation on learning for the green transition and sustainable development** highlighting the role of E&T in working towards the goals of the European Green Deal[268]. It makes 35 recommendations to MS, including:
  - Make learning for the green transition and sustainable development a priority in E&T policies.
  - Provide all learners with opportunities to learn about the climate crisis and sustainability.

[267] Council of the European Union (2023). Council Recommendation on improving the provision of digital skills in education and training.

[268] Council of the European Union (2022). Council Recommendation of 16 June 2022 on learning for the green transition and sustainable development, 2022/C 243/01.https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32022H0627(01)

- Mobilise national and EU funds to invest in green and sustainable equipment, resources, and infrastructure.
- Support educators in developing their knowledge and skills to teach about the climate crisis and sustainability.
- Create supportive learning environments for sustainability.
- Involve students and staff, local authorities, youth organisations, and the research and innovation community[269].

- **GreenComp: The European sustainability competence framework** was published in 2022, and is a reference framework for sustainability competences, providing a common ground to learners and guidance to educators, and advancing a consensual definition of what sustainability as a competence entails.
- The **Council recommendation on promoting common values, inclusive education, and the European dimension of teaching** was published in 2018 and aims to promote a sense of belonging – conveying common values, practicing inclusive education, and teaching about Europe and its MS, to help increase a sense of belonging to one's school, locality, country, as well as the European family. It also seeks to strengthen social cohesion, to fight xenophobia, radicalisation, divisive nationalism, and the spread of fake news[270].

### *Working Groups*

With the aim of supporting the follow-up to the Council recommendation, the **working group on "Learning for sustainability"** was established as a sub-group of the expert "Working group on schools", with the aim of promoting mutual learning and exchange on how education can support the move to a greener and more sustainable Europe, including the development of sustainability competences. In its meetings, working group members discuss how schools, communities, education policies, and programmes, can best support learning about, and for, the environment and sustainability.

### *Other initiatives*

- The **Education for Climate Coalition** community was launched in 2020 with the priorities of training teachers, bridging education with science, developing green skills and competences, raising awareness, and changing behaviours[271]. It has implemented several actions, such as the Conference on Coalition design, First Education for Climate Change Day, and operates as an online platform called **Education for Climate,** on which students, teachers and education stakeholders can act collectively on innovative education solutions for environmental sustainability, by joining groups, starting discussions, and joining participatory challenges[272].

269 European Commission (2022). Learning for the green transition and sustainable development.
270 Council of the European Union (2018). Council Recommendation of 22 May 2018 on promoting common values, inclusive education, and the European dimension of teaching.
271 European Commission. About Education for Climate.
272 European Commission platform on Education for climate change.

- Green transition and sustainability are embedded in the actions funded by the **2021-2027 Erasmus+ programme**. In the 2023 Erasmus+ annual work programme, projects focusing on sustainability in school education, including on developing sustainability competences and skills, promoting positive action on sustainability, tackling eco-anxiety, supporting teacher capacity building, and whole school approaches to sustainability are outlined as a key priority for the year[273].
- Under the **Erasmus+ Teacher Academies** (for more details, see Teacher role, competences and working conditions section) a number of projects focusing on sustainability education are funded. For example, "Teaching sustainability" (TAP-TS) is a project that builds packages of resources relating to sustainability for schools and teacher education, and currently has 168 users, 34 courses, and 729 activities[274]. "CLIMADEMY" helps teachers to understand climate change in its complexity and creates a network of teachers on climate change education[275].
- **SALTO resource centres** were established with the aim of helping to improve the quality and impact of the Erasmus+ programme. These have held various meetings and seminars, including focusing on sustainability education. For example, the 2023 event "Thematic seminar: education for sustainable development", and the upcoming event "Teaching sustainability competences"[276].
- In 2021, the Council of the European Union published a **Civic education package for teachers**, providing teachers with lesson plans on the topic of civic education, specifically to teach children of the role of the Council, including teaching methods, manuals with a step-by-step guide on how to use them, links to all materials, as well as games and videos[277].

### 5.2.11. Skill and competence development

Figure 35 below, presents the key recent developments in relation to skill and competence development in school education.

**Figure 35. Key recent developments in relation to skill and competence development in school education**

| Type | Key developments |
|---|---|
| **Policy** | • EEA targets<br>• Resolution on a strategic framework for European cooperation in E&T<br>• Council recommendation on pathways to school success<br>• Council recommendation on key competences for lifelong learning |
| **Working groups** | • Working Group on Schools (Pathways to School Success sub-group) |
| **Research** | • European Commission report on increasing achievement and motivation in mathematics and science learning in schools |
| **Other initiatives** | • Making the Erasmus+ and European Solidarity Corps more inclusive |

*Source:* Own elaboration.

273 European Commission (2022). 2023 annual work programme: "Erasmus+": the Union Programme for Education, Training, Youth and Sport.
274 Teacher Academy Project 2023.
275 Climacademy.eu.
276 SALTO: a resource centre on training and cooperation activitiesactivities.
277 Council of the European Union (2021). The EU Council Explained: Lesson for practical learners in secondary education (± 12 – 19 years old).

*Policy*

- Low student achievement in the basic skills of literacy, mathematics and science is a concern for many European countries, and so this issue is covered by Commission's **EEA targets**[278]**.**
- The **Council Resolution on a strategic framework for European cooperation in E&T,** published in 2021, set out concrete issues and actions in Priority Area 1 (quality, equity, inclusion, and success in E&T), including promoting the mastering of key competences and basic skills, and helping all learners reach a baseline-level of proficiency in basic skills[279].
- **The Council Recommendation on the Pathways to School Success** is also relevant for addressing basic skills development (for more details, see Degree of inclusion of learners in a disadvantaged situation section).
- Concerning not only basic skills but also competence development, **The Council recommendation on key competences for lifelong learning** was published in 2018, concerning not only basic skills, but also competence development. This identified eight key competences essential to citizens for personal fulfilment, a healthy and sustainable lifestyle, employability, active citizenship, and social inclusion, and set up a common understanding of competences needed now and in the future. The key competences identified are:
  - Literacy competences;
  - Multilingual competences;
  - Mathematical competences and competence in science, technology, and engineering;
  - Digital competences;
  - Personal, social, and learning to learn competences;
  - Citizenship competences;
  - Entrepreneurship competences;
  - Cultural awareness and expression competences[280].

*Working Groups*

The **Working Group on Schools (Pathways to School Success sub-group)**[281] was created to help support the implementation of the Council Recommendation on the pathways to school success.

278 European Commission (2020). 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.

279 Council of the European Union (2021). Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030).

280 Council of the European Union (2018). Council recommendation on key competences for lifelong learning.

281 European Commission. Pathways to School Success.

### *Research*

In 2022, the EC published the report **"Increasing achievement and motivation in mathematics and science learning in schools"**[282], in which they analyse the reasons for the EEA targets related to the development of basic skills still not being met, and suggest ways in which improved achievement in mathematics and science can be ensured, based on analysis of current curricula and their achievement rates.

### *Other Initiatives*

It is important to note that, as it has been confirmed numerous times that low achievement is strongly correlated with socio-economic status and in some cases gender[283], the EC efforts aimed at increasing inclusion of disadvantaged groups also contribute to reducing the share of low achievers. Therefore, many of the policy initiatives discussed in the section on the Degree of inclusion of learners in a disadvantaged situation can be seen as tackling the issue of low achievement in schools, as well. The example of such measures can be the efforts of **making the Erasmus+ and European Solidarity Corps more inclusive** (through development the framework of inclusion measures[284] and the inclusion and diversity strategy[285]).

[282] European Commission, European Education and Culture Executive Agency (2022). Increasing achievement and motivation in mathematics and science learning in schools.

[283] European Commission / EACEA / Eurydice (2022). Increasing achievement and motivation in mathematics and science learning in schools.

[284] European Commission (2021). Commission Implementing Decision (EU) 2021/1877 of 22 October 2021 on the framework of inclusion measures of the Erasmus+ and European Solidarity Corps Programmes 2021-2027.

[285] European Commission (2021). Implementation Guidelines – Erasmus+ and European Solidarity Corps Inclusion and Diversity Strategy.

# 6. Recommendations and conclusions

As the above overview reveals, the European Commission's policy initiatives generally align with the preferred scenario developments. However, a few issues remain inadequately addressed, or need further attention, to achieve the desired school education situation by 2040.

## 6.1. Education funding

Funds allocated to support Member States' education reforms (e.g. RRF, ESF+, Erasmus+, and other EU funds), and initiatives promoting more effective and targeted Member States' investments play a pivotal role in transforming education systems across the EU. Consequently, it is recommended that the EU and Member States take the following actions (presented in the Figure 36 below):

**Figure 36. Recommendations relating to education funding**

| Recommendation | Intended recipient |
|---|---|
| Maintain or further increase financing for the Erasmus+ programme | EU |
| Continue to provide funding for education reforms in Member States (e.g. using EU funds, such as ESF+, Technical Support Instrument, and targeted allocations similar to RRF) | EU |
| Continue promoting effective and targeted investments of Member States and their robust evaluation, including through the Learning Lab on Investing in Quality Education and Training | Commission |
| Ensure effective and targeted investments of EU funds for implementing education reforms at national-level and their robust evaluation | Member States |

*Source:* Own elaboration

## 6.2. Inclusion of learners in a disadvantaged situation

Significant efforts are already underway across the EU to reduce educational inequity and promote inclusive education. However, to achieve the long-lasting change leading towards the preferred scenario developments, it is recommended that the European Commission, Member States, and other school education stakeholders take the following actions (presented in Figure 37 below):

**Figure 37. Recommendations related to inclusion of learners in a disadvantaged situation**

| Recommendation | Intended recipient |
|---|---|
| Increase funding and intensify their efforts in research focused on identifying and understanding the effects of policy measures aimed at reducing educational inequity. While the causes of educational inequity are generally well-researched, a rigorous assessment of the impact of policies and programmes aimed at reducing inequity is often lacking | Commission, Member States, academic community |

| Recommendation | Intended recipient |
|---|---|
| Continuously monitor progress towards reducing the education achievement gap of students impacted by different factors known to cause underachievement – the new EU-level indicator on inclusion and equity, introduced in the 2022 Education and Training Monitor, should be expanded to include information on other discrimination grounds, besides the socio-economic status (e.g. migration background) | Commission, Member States |
| Continuously collect national-level data on indicators monitoring the reduction of the education achievement gap needed for monitoring it at EU-level | Member States |
| Establish and contribute to the establishment of the European framework for diversity and inclusion, incorporating a wide array of views of education stakeholders | Commission, Member States, student, teacher, school leader umbrella organisations, school and academic communities, other school education stakeholders |
| Ensure that inclusion and equity are embedded as the cross-cutting principles in all upcoming EU-level school education policy initiatives (e.g. the focus on inclusion in the Erasmus+ and the European Solidarity Corps 2021-27 programmes should extend beyond 2027). | Commission |
| Ensure that, where relevant, inclusion and equity are embedded as the cross-cutting principles in all upcoming national-level school education policy initiatives | Member States |

*Source:* Own elaboration

## 6.3. Degree of digitalisation and existing/planned regulation

The implementation of the Digital Education Action Plan (DEAP) 2021-2027 significantly accelerates progress in overcoming the barriers to digital education uptake in schools, including by addressing digital skill shortages. This has been achieved through the development of digital competence self-assessment tools for schools and teachers (e.g. SELFIE and SELFIE for TEACHERS), and learning and experience exchange platforms (e.g. Erasmus+ Teacher Academies, SALTO Digital Resource Centre). However, there is still room for improvement in terms of their broader uptake and usefulness to the end users. Therefore, it is recommended that the European Commission, Member States, and other school education stakeholders take the following actions (presented in Figure 38 below):

**Figure 38. Recommendations related to digital skills shortages**

| Recommendation | Intended recipient |
|---|---|
| Monitor the SELFIE and SELFIE for TEACHERS user feedback on the experience of the tools to identify and remove barriers to their wider uptake, and further enhance user experience | Commission |
| Develop a repository of learning materials or link existing EU-level (e.g. SALTO Digital Resource Centre) and Member States-level repositories to different SELFIE areas and SELFIE for TEACHERS competence areas. This should provide guidance and resources for schools and teachers to improve identified areas/competence areas in need of improvement. | Commission, Member States |
| Ensure, where relevant and feasible, availability of the above learning materials in the national language | Member States |

| Recommendation | Intended recipient |
|---|---|
| Ensure increasing and balanced across the Member States uptake of the digital learning and experience exchange platforms (e.g. Erasmus+ Teacher Academies, SALTO Digital Resource Centre), and self-assessment tools (e.g. SELFIE and SELFIE for TEACHERS) | Commission, Member States |
| Facilitate development and access to high-quality digital education content across the EU to be included in the existing, or newly established, repositories of learning materials | Commission, Member States, school and academic communities, Ed Tech companies, other school education stakeholders |
| Open anonymised SELFIE and SELFIE for TEACHERS user data to researchers for in-depth analysis of the school digital preparedness and teacher digital competences, aiming to propose effective strategies for improving school digital readiness and teacher digital competences across the EU | Commission |
| Use the anonymised SELFIE and SELFIE for TEACHERS user data for in-depth analysis of the school digital preparedness and teacher digital competences, aiming to propose effective strategies for improving school digital readiness and teacher digital competences across the EU | Academic community |

*Source:* Own elaboration

While digital well-being and social risks in AI seem to be adequately addressed (e.g. in the Ethical guidelines on the use of AI, and data in teaching and learning for educators), similar attention for these aspects seems to be lacking for other digital tools and technologies (e.g. extended reality technologies, online learning platforms). To address this, it is recommended that the European Commission, Member States, and other school education stakeholders take the following actions (presented in Figure 39 below):

**Figure 39. Recommendations related to well-being in digital education**

| Recommendation | Intended recipient |
|---|---|
| Develop and participate in the development of comprehensive guidelines for educators, focusing on the identification and mitigation of social risks and the promotion of well-being in digital education | Commission, Member States, student, teacher school leader umbrella organisations, school and academic communities, other school education stakeholders |
| Introduce and contribute to introducing self-assessment tools (e.g. as new modules within SELFIE or SELFIE for TEACHERS tools), allowing for evaluation of how effectively schools are addressing digital well-being issues and digital education social risks | Commission, academic community, student, teacher, school leader and teacher educator umbrella organisations |

*Source:* Own elaboration

Another issue hindering the wide-spread adoption of digital education across the EU is the limited availability of fast internet connections and networks in schools. Despite the 2016 European Commission target[286] of all schools having a high-speed broadband connection by 2025, a recent audit by the European Court of Auditors[287] revealed that many EU Member States are still lagging behind in achieving this goal. Therefore, it is recommended that the European Commission and Member States take the following actions (presented in Figure 40 below):

[286] Communication from the Commission on Connectivity for a Competitive Digital Single Market – Towards a European Gigabit Society, COM(2016) 587.

[287] European Court of Auditors (2023). EU support for the digitalisation of schools. Special report.

**Figure 40. Recommendations related to school internet connectivity**

| Recommendation | Intended recipient |
|---|---|
| Monitor and encourage/ensure the achievement of the target of being connected to gigabit internet by 2025 for all schools | Commission, Member States |

*Source:* Own elaboration

## 6.4. Pedagogical and teaching methods

While initiatives, like the European Innovative Teaching Award, highlight good practices in flexible/adaptable pedagogical and teaching methods, there is room for their further enhancement. To maximise the benefits of the European Innovative Teaching Award for schools and teachers across the EU, it is recommended that the European Commission, Member States, and other school education stakeholders take the following actions (presented in Figure 41 below):

**Figure 41. Recommendations related to pedagogical and teaching methods**

| Recommendation | Intended recipient |
|---|---|
| Along with the database and an integrated report providing short information on all projects recognised through the European Innovative Teaching Award, conduct and provide information for their in-depth analysis, identifying their success factors and transferable practices. This could be done each year or once every few years, based on the analysis of the projects selected for the award during that period | Commission, Member States, academic community, school communities receiving the award |
| Based on the results of the above analysis, produce, and contribute to producing methodological guidance for the school community, providing support in choosing and applying more flexible and innovative pedagogical and teaching methods | Commission, Member States, student, teacher, school leader umbrella organisations, school and academic communities, other school education stakeholders |
| Develop and participate in the development of recommendations or guidelines for Member States to ensure that student-centred, flexible, and innovative pedagogical and teaching methods are embedded in initial teacher education (ITE), as well as continuous professional development (CPD) programmes | Commission, Member States, student, teacher, school leader umbrella organisations, academic community |
| Embed student-centred, flexible, and innovative pedagogical and teaching methods in the ITE, as well as CPD programmes | Member States, teacher educators, national teacher educator umbrella organisations |
| Develop and participate in the development of recommendations or guidelines for Member States to ensure that teachers have sufficient autonomy, time, and level of relevant competences, to try out and adapt innovative and flexible pedagogical and teaching methods | Commission, Member States, student, teacher, school leader umbrella organisations, school and academic communities |
| Ensure that teachers have sufficient autonomy, time, and level of relevant competences to try out and adapt innovative and flexible pedagogical and teaching methods | Member States, teacher educators, national teacher educator umbrella organisations |
| Ensure that school leader and teacher standards, competence frameworks, and/or professional profiles reflect the skills needed to facilitate effective adoption of the student-centred, flexible, and innovative pedagogical and teaching methods | Member States |

*Source:* Own elaboration

## 6.5. Personalised and blended learning

There is significant progress in promoting blended learning through a dedicated Council Recommendation and handbook on blended learning and the work of the Working Group on Schools. There has also been a few EU-level peer learning and good practice exchange events (e.g. blended learning was selected as a topic for the Innovative European Teacher Award). Taking this into account it is recommended that the European Commission and Member States, based on the insights of the Working Group on Schools, take the following actions (presented in Figure 42 below):

**Figure 42. Recommendations related to personalised and blended learning**

| Recommendation | Intended recipient |
|---|---|
| Continue to promote an EU approach to blended learning, emphasising its role in supporting quality and flexible, adaptive, and inclusive education | Commission |
| Ensure that schools have sufficient financial resources to support personalised and blended learning design, implementation, and evaluation | Member States |
| Ensure that school leaders and teachers have the time and flexibility to innovate with personalised and blended learning approaches | Member States |
| Ensure that school leader and teacher standards, competence frameworks, and/or professional profiles reflect the skills needed to facilitate effective personalised and blended learning | Member States |
| Encourage and create incentives and opportunities for personalised and blended learning related professional learning for school leaders and teachers | Member States |

*Source:* Own elaboration based on the work of the Working Group on Schools

## 6.6. Assessment methods

Significant efforts have been made to understand assessment challenges, for example: the recent "Prospective report on the future of assessment in primary and secondary education", and the work of the Working Group on Schools in producing recommendations for strengthening the introduction of the formative assessment in schools. However, recommendations, guidance, good practice exchange, and peer learning events, concerning innovative assessment methods aimed at Member States, are still lacking. Therefore, it is recommended, that the European Commission, Member States, and other school education stakeholders take the following actions (presented in Figure 43 below):

**Figure 43. Recommendations related to assessment methods**

| Recommendation | Intended recipient |
|---|---|
| Follow the conclusions of the above-mentioned report and the work of the Working Group on Schools to provide recommendations and guidance for Member States (focusing on teachers and schools) on introducing innovative types of assessment in school education | Commission, Member States, student, teacher, school leader umbrella organisations, school and academic communities, other school education stakeholders |
| Support and participate in good practice exchange and peer learning through organising dedicated peer learning events, focusing on innovative assessment types, and introducing innovative assessment topics in the existing good practice exchange and peer learning events (e.g. by selecting innovation in assessment as one of the topics of the European Innovative Teaching Awards) | Commission, Member States |
| Fund projects focusing on developing modules on innovative assessment methods under Erasmus+ Teacher Academies. | Commission, other school education stakeholders, submitting projects to Erasmus+ Teacher academies |

*Source:* Own elaboration

## 6.7. Teacher role, competences and working conditions

Worsening teacher working conditions and increasing teacher shortages across the EU are well-known (e.g. this is acknowledged in the 2020 Council conclusions on European teachers and trainers for the future), and being tackled (e.g. through the initiatives related to enhancing teacher mobility, training, recognition of innovative teaching, and career guidance). However, existing policy measures do not seem to be sufficient to overhaul the above-mentioned issues, so far. Therefore, it is recommended that the European Commission, Member States, and other school education stakeholders take the following actions (presented in Figure 44 below):

**Figure 44. Recommendations related to teacher role, competences and working conditions**

| Recommendation | Intended recipient |
|---|---|
| Recognise the changing teacher roles, worsening working conditions, and increasing shortages as the key school education concern | Commission, Member States |
| Launch and take part in a strategic dialogue within the existing structures with Member States and school education stakeholders (e.g. European Trade Union Committee for Education, Association for Teacher Education in Europe, and others) on the above-mentioned issues with an aim to develop a long-term, comprehensive plan for tackling them that would be of similar scope to the DEAP 2021-2027 plan for tackling digital education-related issues | Commission, Member States, student, teacher, school leader umbrella organisations, school and academic communities |

*Source:* Own elaboration

Introduction of focus topic-related skills in ITE and CPD is seen as one of the key policy measures supporting the achievement of change in areas ranging from promoting inclusion[288], to digital education[289], to tackling disinformation[290], to assessment[291]. Eurydice collects information on ITE and CPD arrangements in Member States, providing comparative reports (e.g. Teachers in Europe: Careers, Development and Wellbeing), analysing the minimal duration, length, and compulsory elements of ITE and CPD. However, the research on the contents of ITE and CPD across the EU are still lacking. Therefore, it is recommended that the European Commission, Member States, and other school education stakeholders take the following actions (presented in Figure 45 below):

**Figure 45. Recommendations related to teacher ITE and CPD**

| Recommendation | Intended recipient |
|---|---|
| Research the content and uptake of ITE and CPD across the EU, with particular attention dedicated to whether the above-illustrated and other relevant topics are integrated into ITE and CPD, and in what way | Commission, Member States, academic community |
| Launch and take part in a strategic dialogue within the existing structures with Member States and education stakeholders (e.g. European Trade Union Committee for Education, Association for Teacher Education in Europe, and others) on the contents and uptake of ITE and CPD across the EU | Commission, Member States, student, teacher, school leader umbrella organisations, school and academic communities, other school education stakeholders |

*Source:* Own elaboration.

## 6.8. AI adoption

With the ethical guidelines of the use of AI and the upcoming AI regulation act, the risks posed by AI are being at least partly tackled at EU-level. However, it is equally crucial to promote the benefits of AI use. Recognising that the use of AI requires specific knowledge and understanding, it is recommended that the European Commission, Member States, and other school education stakeholders take the following actions (presented in Figure 46 below):

**Figure 46. Recommendations related to AI adoption**

| Recommendation | Intended recipient |
|---|---|
| Fund projects to develop training modules on commonly used AI systems in education, covering their features, limitations, and application possibilities under the Erasmus+ Teacher Academies. | Commission, other school education stakeholders, submitting projects to Erasmus+ Teacher academies |

288 E.g. The Council conclusions on equity and inclusion in E&T in order to promote educational success for all ask for including educational disadvantage and inclusion topics in ITE and CPD.

289 E.g. The Council Recommendation on improving provision of digital skills in E&T asks for providing quality training on digital pedagogy in ITE and CPD.

290 E.g. the Expert Group on Tackling Disinformation and Promoting Digital Literacy Through E&T in their final report asks for more prominent integration of digital literacy courses in ITE and in this way build resilience against disinformation.

291 Working Group on Schools (sub-group on Pathways to School Success) recommends that assessment should be fully integrated in ITE and compulsory and comprehensive CPD for school leaders and teachers.

| Recommendation | Intended recipient |
|---|---|
| Utilise existing initiatives and, if there is a justified need, establish new opportunities for the exchange of good practices and international peer learning about AI adoption (e.g. by selecting the use of AI tools in school education as one of the topics of the European Innovative Teaching Awards). | Commission, Member States |

*Source:* Own elaboration

## 6.9. Interdisciplinary learning

While the interdisciplinarity in sustainability and digital education is being promoted through the Council Recommendations on learning for green transition and sustainable development and on improving provision of digital skills in E&T, there is still room for improvement. To advance interdisciplinary learning in schools, it is recommended that the European Commission, Member States, and other school education stakeholders take the following actions (presented in Figure 47 below):

**Figure 47. Recommendations related to interdisciplinary learning**

| Recommendation | Intended recipient |
|---|---|
| Monitor the extent of interdisciplinary education across the EU by including related questions in existing EU-wide school education surveys or launching new dedicated surveys | Commission, Member States, other international organisations (e.g. OECD) |
| Ensure the provision of more ready-made materials for schools promoting integrated content knowledge and skill development. An example of this could be the EU-wide project Girls Go Circular, which combines the development of digital and entrepreneurial skills with the content knowledge on circular economy | Commission, Member States |
| Fund similar EU-wide projects, focusing on providing interdisciplinary approach and materials on other topics than the circular economy (e.g. other aspects of sustainability or civic education) | Commission |
| Fund projects highlighting and making use of intersections between different subjects (e.g. sustainability/civic education and digital education) under the Erasmus+ Teacher Academies | Commission, other school education stakeholders, submitting projects to Erasmus+ Teacher academies |
| Facilitate and participate in peer learning and good practice sharing on interdisciplinary learning through dedicated events | Commission, Member States |
| Ensure that teachers have sufficient autonomy, time, and level of relevant competences, to try out and adapt interdisciplinary learning | Member States |
| Ensure that school leader and teacher standards, competence frameworks, and/or professional profiles reflect the range of skills needed to facilitate effective adoption of interdisciplinary learning | Member States |

*Source:* Own elaboration

## 6.10. Sustainability and civic and citizenship education

With the recent Council Recommendation on learning for the green transition and sustainable development, the work of the Working Group on Schools, and the ongoing initiatives related to civic education, there is progress towards introducing sustainability and strengthening civic education in school education across the EU. To further this progress, it is recommended that the European Commission, Member States, and other school education stakeholders take the following actions (presented in Figure 48 below):

**Figure 48. Recommendations related to sustainability and civic and citizenship education**

| Recommendation | Intended recipient |
|---|---|
| Develop and participate in the development of self-assessment tools, similar to SELFIE, to assess current status of schools regarding sustainability and civic education. School-level self-assessment tools are important, as both sustainability and civic education should be embraced following the whole-school approach | Commission, school and academic communities, student, teacher, school leader umbrella organisations |
| Develop and participate in the development of self-assessment tools, similar to SELFIE for TEACHERS, to allow educators to assess their sustainability (e.g. based on GreenComp framework), and civic education competences | Commission, academic community, student, teacher, school leader and teacher educator umbrella organisations |
| Provide further support for teachers to develop sustainability education skills. Some Erasmus+ Teacher Academies already address this issue. More academies, focusing on this topic, should be funded | Commission, Member States, other school education stakeholders, submitting projects to Erasmus+ Teacher academies |
| Promote and participate in the good practice exchange and peer learning on sustainable learning spaces, for example, by selecting sustainable learning spaces in school education as one of the topics of the European Innovative Teaching Awards and continuing funding projects like NEB Lab: Transformation of places of learning | Commission, Member States, school communities |

*Source:* Own elaboration

## 6.11. Skill and competence development

Significant efforts, dedicated to reducing inequity in education, positively affect the levels of underachievement in basic skills. However, the opportunities for affecting basic skill development through curriculum and lesson structure, instruction time, and pedagogical methods is not fully embraced. Therefore, it is recommended that the European Commission, Member States, and other school education stakeholders take the following actions (presented in Figure 49 below):

**Figure 49. Recommendations related to skill and competence development**

| Recommendation | Intended recipient |
|---|---|
| Produce and support producing of the guidelines for teachers and schools on tackling underachievement encompassing teaching practices, school curriculum structure, instruction time, and others. This should be based on the 2022 Eurydice report and further research | Commission, Member States, student, teacher school leader umbrella organisations, school and academic communities, other school education stakeholders |

*Source:* Own elaboration

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# List of figures

# Glossary of foresight concepts

- **Alternative ways of schooling** – this refers to a number of approaches to teaching and learning, other than traditional publicly or privately-run schools. These might include outdoor schools, democratic schools, Freineit, Waldorf schools, home-schooling, and other.
- **Artificial intelligence** – computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages. In education, it is used to augment the role of teachers and automate some tasks, such as assessment, plagiarism checking, administration, and feedback.
- **Baseline** – a set of reference data used as a basis for comparison.
- **Blended learning** – type of learning either blending the school site and other physical environments away from the school site, or blending different learning tools that can be digital (including online learning) and non-digital.
- **Civic and citizenship education** – thematic area focusing on the FoC related to the provision of information and learning experiences to equip and empower school students to participate in democratic processes. Also, to become able citizens that recognise their individual responsibility for society and the duty of care to others, foster harmonious co-existence and mutually beneficial development of individuals and of the communities they are part of. Civic and citizenship competences needed include the ones mentioned above, as well as the ability to communicate (both offline and online) in non-violent ways, to recognise and counter anti-civil behaviour, in addition to learning to live with difference. These skills need to be routinely applied in their day-to-day life, and support students in becoming active, informed, and responsible citizens, who are willing and able to take responsibility for themselves and for their communities at the local-, regional-, national-, and international-level.
- **Critical uncertainty** – areas of complex systems with high impact and limited knowledge about their future evolution. Uncertainties that cannot be ignored, avoided, or reduced can be adopted as axis of uncertainties, to frame the scenarios and exploring diverse futures and their consequences.
- **Digital education** – thematic area focusing on the FoC related to the innovative use of digital tools, technologies, and resources in teaching and learning for the development of digital and other (e.g. sustainability) competences. Digital competence areas include information and data literacy, communication and collaboration, digital content creation, safety, and problem solving[292].
- **Drivers** – developments causing change, affecting, or shaping the future. A driver is the cause of one or more effects[293].
- **Education policy** – refers to all laws, regulations, and processes that are designed and implemented to achieve particular educational goals.

[292] European Commission / DG JRC (2022). DigComp 2.2: The Digital Competence Framework for Citizens With new examples of knowledge, skills, and attitudes, p. 4.

[293] Effects are all the linked changes that change itself causes. Cause-effect relationships might have different levels of discernibility, depending on the complexity of the system.

- **Education system** – refers to patterns of organisation of education provision approached at a country (or national) level.
- **Emerging issues and weak signals** – early signs (e.g. events, new technologies or practices) anticipating or pointing to possibly emerging issues, which are not yet confirmed or strengthened (into a trend) and can either develop into a strong signal or wither away, as time passes. An example of weak signal would be the emergence of alternative ways of schooling: across Europe, millions of parents are working from home, and their increased flexibility and their first-hand experience with remote learning has encouraged more people to explore alternative educational models, such as home-schooling or outdoor schooling.
- **Equity, diversity, and inclusion (EDI) in education** – thematic area concerned with facilitating and guaranteeing equitable access to resources and learning opportunities for students from diverse backgrounds, whether this is linked to ethnic minorities and race, cultural or religious minorities, disability, socio-economic background, or gender.
- **Explorative scenarios** – scenarios that openly probe and explore several alternatives – what is possible regardless of what is desired (preferred futures).
- **Factors of change** – any change with influence on the system being studied that might unfold into different directions in the future. According to their importance and uncertainty, they can be divided into five categories: 1) megatrends, 2) general trends, 3) emerging trends, 4) weak signals, and 5) "wild cards" or "black swans".
- **General competences** – competences that can be applied across different environments. These are, for example, problem solving and critical thinking, information, media and data literacy, communication and collaboration, entrepreneurship competences, and others.
- **General trends** – general tendency or direction of a development or change over time. A general trend may be strong or weak, increasing, decreasing, or stable. There is no guarantee that a general trend observed in the past will continue in the future. An example of increasing general trend would be the aging of the teacher population: in the EU, almost 40% of lower secondary teachers are 50 years old or above, and less than 20% are below 35 years old[294].
- **Global education** – thematic area focusing on education that incorporates learning about cultures, geographies, histories, and current issues of all the world's regions.
- **Interdisciplinary education** – thematic area focusing on education that employs integration of methods and analytical frameworks from more than one academic discipline to examine a theme, issue, question, or topic. It relies on multiple content cogs working together to develop student knowledge, problem-solving skills, self-confidence, self-efficacy, and a passion for learning, while supporting students' various learning styles, diverse backgrounds, interests, talents, and values.
- **Lifelong learning** – thematic area focusing on the ongoing, voluntary, and self-motivated pursuit of knowledge for personal and/or professional reasons.

[294] European Commission, European Education and Culture Executive Agency (2021). Teachers in Europe: Careers, development and well-being, p. 32.

- **Megatrends** – great global or large-scale forces in societal development that will very likely affect the future in all areas over the next 10-15 years. An example of a megatrend would be the accelerating technological change and hyperconnectivity: technologies are changing how we live; the ways, speed, and scale at which we communicate locally and globally; the way in which scientific progress and solutions to societal problems increasingly involve advanced technology and AI, the transformation of systems of production, management, and governance, as well as the requirements of school education and curricula.
- **Personalised learning** – learning that is adaptive to individual knowledge, experience, and interests, and effective and efficient in supporting and promoting desired learning outcomes.
- **School education in the EU** – formal primary and secondary (ISCED 1-3) education taking place in schools in the EU-27. The study does not cover VET or non-formal school education.
- **Shadow education** – private, paid supplementary tutoring of subjects that are part of the core mainstream curricula (such as mathematics, language, or science).
- **Sustainability education** – thematic area focusing on the FoC related to supporting learners to acquire the knowledge, skills, and attitudes, needed to live more sustainably, in changing patterns of consumption and production, in embracing healthier lifestyles and in contributing – both individually and collectively – to a more sustainable economy and society, where planetary boundaries are respected. It is an umbrella term for different related concepts, such as environmental education, education for sustainable development, education for sustainability, ecological education, and others. It involves teaching sustainability competences, which include environmental sustainability values, "futures literacy"[295], critical thinking, adaptability, and acting for sustainability, amongst others. Such teaching promotes understanding of the interconnected global challenges we face, including the climate crisis, environmental degradation and biodiversity loss, all of which have environmental, social, economic, and cultural dimensions.
- **Teachers and school governance** – thematic area focusing on the FoC related to teachers and other school personnel (including school or school system administrators, proprietors, paraprofessionals, aides, substitute teachers, school secretaries, etc.), as well as other school governance actors, such as local policymakers, education committees, and governing bodies.
- **Technical skills** – the specialised knowledge and expertise required to perform specific work-related tasks and use specific tools and programmes.
- **Well-being in schools –** thematic area focusing on the FoC related to creating a favourable physical and online environment outside and inside schools, a social learning environment in which civil values and care for oneself, and the others, are prioritised, as well as to creating means for self-fulfilment in schools and developing effective mechanisms and support systems related to the mental health and well-being of pupils, teachers, and other education n personnel.
- **Wild cards and black swans** – surprising and rare events, that might constitute turning points in the evolution of a certain system. Extremely low probability, dramatic impact. An example of wild card/black swan would be the COVID-19 pandemic: through history, pandemics represented turning points catalysing change and shaping societies; and the 11/9/2001 attack on the World Trade Centre in New York City: the aftermath led to the so-called "war on terror".

295 UNESCO Futures Literacy Labs.

# Abbreviations

| | |
|---|---|
| **AI** | Artificial Intelligence |
| **ACIIS** | The Academy for creative, innovative and inclusive schools |
| **CLIL** | Content and Language Integrated Learning |
| **CPD** | Continuing Professional Development |
| **CUs** | Critical Uncertainties |
| **DEAP** | The Digital Education Action Plan 2021-2027 |
| **DEPP** | The Directorate of Evaluation, Forecasting, and Performance Monitoring |
| **DDPP** | The Digital Decade Policy Programme |
| **DG EAC** | Directorate General for Education, Youth, Sport, and Culture |
| **EACEA** | European Education and Culture Executive Agency |
| **EC** | European Commission |
| **EDI** | Equity, diversity, and inclusion |
| **Ed Tech** | Education Technology |
| **EEA** | European Education Area |
| **E&T** | Education and Training |
| **EU** | European Union |
| **FoC** | Factors of change |
| **GDPR** | General Data Protection Regulation |
| **HE** | Higher Education |
| **ISCED** | International Standard Classification of Education |
| **ITE** | Initial teacher training |
| **JRC** | Joint Research Centre |

| | |
|---|---|
| **LCP** | Learner-centred Pedagogy |
| **MS** | EU-27 Member States |
| **OECD** | The Organisation for Economic Cooperation and Development |
| **RfS** | Request for Services |
| **SEN** | Special Educational Needs |
| **UNESCO** | United Nation Educational, Scientific, and Cultural Organisation |
| **VET** | Vocational Education and Training |
| **VLE** | Virtual Learning Environment |

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