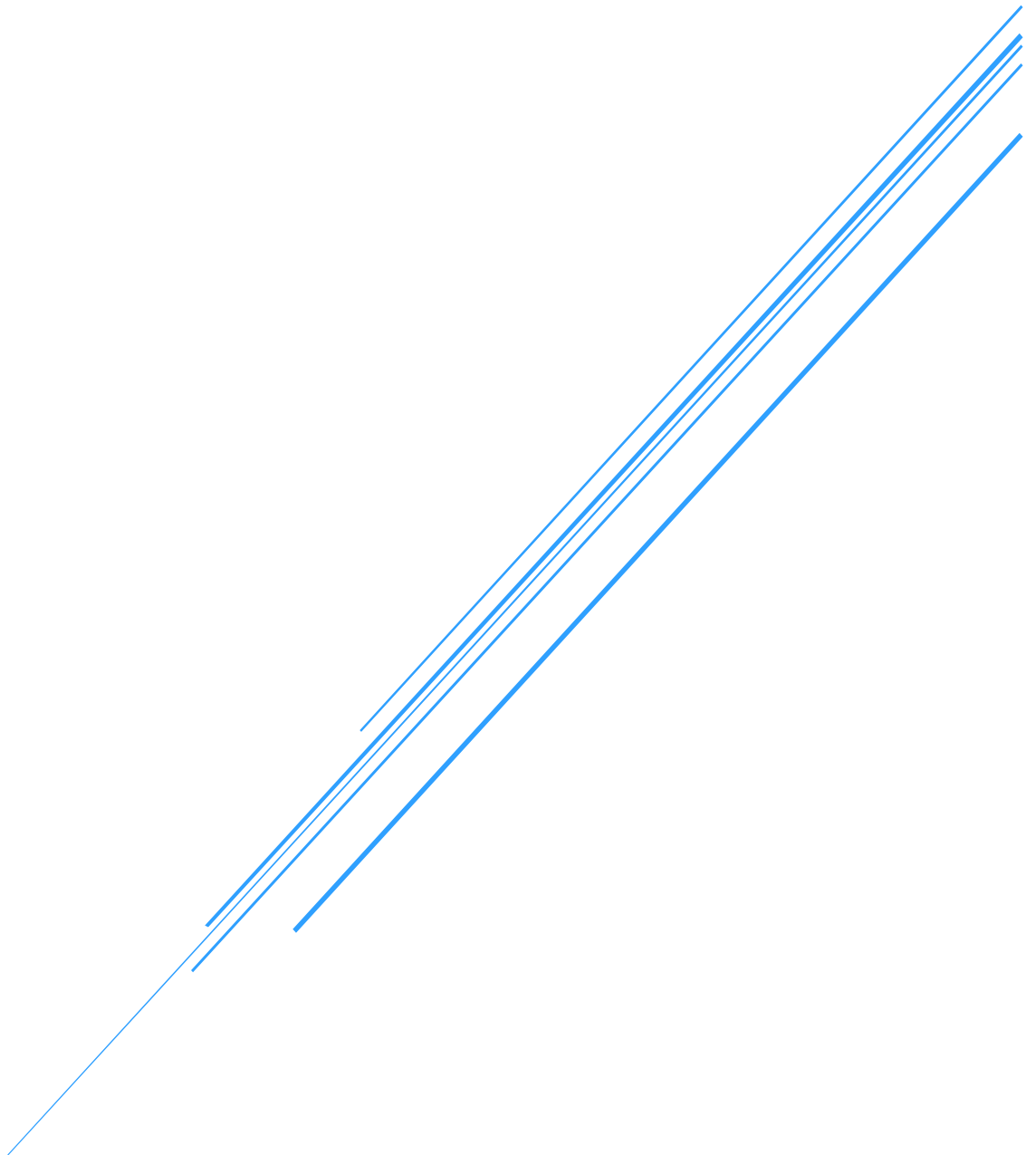


EDUCATION & SKILLS DEVELOPMENT

Towards a Strategic Research & Innovation Agenda for
the new European Partnership on Social Transformations
and Resilience



IMPRINT

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Executive Summary

This report presents the findings of a Strategic Foresight process conducted to systematically and co-creatively explore developments related to education and skills. The aim is to inform the Strategic Research and Innovation Agenda (SRIA) that will be developed to guide the European Partnership on Social Transformations and Resilience from 2027 to 2033. To ensure depth and relevance, a Strategic Foresight cycle will be carried out for each of the Partnership's four impact areas, (1) 'Supporting the modernisation of social protection systems and essential services', (2) 'Shaping the future of work', (3) 'Fostering education and skills development', and (4) 'Contributing to a fair transition towards climate neutrality'. The results of these individual foresight exercises will be synthesized into the final SRIA. Building on the first cycle on the Future of Work, this second cycle addresses the future of Education and skills development — a domain closely linked to labour market change but with its own fundamental challenges and dynamics.

To anticipate major developments and translate insights into strategic input for the SRIA, this foresight cycle combined desk research, stakeholder engagement, and scenario-building in a multi-step process. We began with a trend analysis to identify the main forces shaping education and skills in the coming 10–15 years. Based on systematic desk research, 26 initial trends were collected. These were subsequently discussed with experts in a series of interviews, which added nuance, highlighted overlooked aspects, and situated the trends within wider societal and institutional contexts. Building on this, experts from academia and beyond were invited to participate in an online survey to prioritise the 26 trends with eventually 132 respondents from 22 countries validating, correcting and supplementing those trends. This quantitative step resulted in a ranked list of the ten most impactful developments, which were further substantiated through qualitative input from interviews and survey comments.

Together, these trends capture how demographic shifts, digitalisation and the green transition, changing learning modes, and new labour market and societal expectations are reshaping education systems. They highlight pressures on teacher supply, widening divides in access and outcomes, and persistent barriers to adult learning. At the same time, they point to the growing importance of well-being, social and emotional competences, and lifelong learning as cornerstones of resilient and future-ready societies.

The first-, second-, and third-order implications of these trends were explored in a workshop with 32 participants from across Europe. Participants mapped cascading effects and clustered them into thematic patterns. Building on this material, a best-case scenario for the future of education and skills in Europe by 2040 was developed. Rather than describing a vision, the scenario translates the validated trends and their implications into a coherent picture of how education and skills systems could evolve under favourable conditions. It is structured around five interconnected pillars:

- A Sustainable, Empowered Teaching Workforce
- Fair and Responsible Use of Technology in Education
- Embedding Well-Being and Social Skills in Education
- Lifelong Learning for All
- Resilient Education in the Face of Demographic Change and the Twin Transition

Together, these pillars describe a future where education systems have adapted to demographic and technological pressures, safeguarded equity and well-being, and embraced lifelong and life-wide learning as a cornerstone of social resilience.

The scenario will serve as the basis for the next foresight phase: a backcasting exercise in early 2026. This step will translate the scenario into concrete action pathways and recommendations for the SRIA, aligning research and innovation priorities with long-term societal needs across Europe.

1. Background and Introduction

Europe is undergoing profound transformations. The green and digital transitions, demographic shifts, and unforeseen disruptions such as pandemics or economic crises are reshaping societies and institutions. In this rapidly changing world, it is crucial that European societies become more inclusive, cohesive, and resilient. In an era of accelerating change, strengthening Europe's capacity for social resilience, cohesion, and innovation is not only a strategic necessity, but a foundation for inclusive and sustainable futures.

In response to these challenges, the European Commission has proposed a co-funded **European Partnership on Social Transformations and Resilience (STR)** under the Horizon Europe Framework Programme for Research and Innovation (R&I). By bringing together insights from the humanities and social sciences, the Partnership aims to promote inclusive sustainable development and strengthen cultural, social and economic resilience.

The **overarching goals** of the STR Partnership are to (Draft proposal 2025):

- 'Create a 7-year Research and Innovation (R&I) programme for the social sciences and humanities (SSH) to explore and make use of their potential to build resilience, ensure fairness and inclusiveness, and foster social cohesion in the light of changes in climate and environment, technology, demography, and unexpected shocks.
- Develop knowledge, tools and innovative solutions to address contemporary social challenges in a collaborative, interdisciplinary and systematic way.
- Contribute to new strategies and policy solutions at European, national, and regional level.'

Throughout 2024, a drafting group has developed the Commission's initial proposal into a fully-fledged programme of interest to the Partnership's future partners. The Draft Guidance Proposal is focused on **four key impact areas**:

1. Supporting the modernisation of social protection systems and essential services
2. Shaping the future of work
3. Fostering education and skills development
4. Contributing to a fair transition towards climate neutrality

A central element of the future Partnership will be a **Strategic Research and Innovation Agenda (SRIA)** that will guide the Partnership's work from 2027 to 2033. The SRIA is expected to anticipate the main challenges to be addressed, propose lines of enquiry, and outline actions that translate research into strategies for policy-making. It will serve as a flexible framework for topics and activities of short-, medium-, and long-term relevance, while allowing for adaptation and iteration in response to emerging needs.

To ensure the SRIA is future-oriented and policy-relevant, the drafting process is informed by **Strategic Foresight**. This methodology enables the systematic exploration of future developments and supports evidence-based, proactive decision-making. Strategic Foresight is already used by the European Commission, national governments, universities, and various other organisations to identify emerging trends, anticipate shocks, and prepare agile responses. It shifts the perspective from reactive to proactive planning.

Tools such as **trend analysis, visioning, and backcasting** are particularly valuable in navigating the dynamic ecosystem in which networks such as HERA and initiatives such as the STR-Partnership operate. These methods help identify and prioritise issues of relevance over different time horizons. Given the complexity of the task, we adopt a **truly co-creative process** that integrates diverse perspectives from **across Europe**, encompassing **different academic disciplines** (including but not limited to the humanities and social sciences) and a **broad range of stakeholders** (such as policymakers and decision-makers from civil society, social partners, public administrations, and the private sector).

To ensure depth and relevance, we carry out a dedicated Strategic Foresight process for each of the Partnership's four impact areas. The results of these individual foresight exercises will then be synthesised into the final SRIA.

In support of this ambition, HERA has committed to contributing actively to the development of the SRIA and to ensuring that the perspectives of the humanities and social sciences are embedded from the outset. To this end, HERA commissioned DLR Projektträger (DLR-PT) to liaise with the Partnership Drafting Group and the Partnership candidature coordinator. Drawing on its expertise in Strategic Foresight and its long-standing experience in supporting humanities and social sciences research, DLR-PT was commissioned to design and implement the foresight process and, based on the results of the foresight process, to draft the SRIA.

This report presents the findings of the second foresight cycle on '**Education and Skills Development**'. Education and skills development are key levers for ensuring that Europe can thrive in the face of far-reaching social, technological, and environmental change. As the demands of the labour market evolve, the capacity of individuals and institutions to learn, adapt, and re-skill will impact economic development and social cohesion. This foresight cycle explores how emerging trends are reshaping education and training systems, and what this means for learners, educators, institutions, and policy-makers alike.

The report is structured as follows: The **next chapter** provides an overview of the foresight process on future education and skills development, including trend analysis, the online survey, expert interviews, the trend workshop, and how these activities contributed to the development of the proposed scenario. The following chapters then present our results: **Chapter 3** presents the trend collection, combining insights from desk research and stakeholder inputs gathered through the survey and interviews. **Chapter 4** summarises first- and second order implications for each trend. **Chapter 5** outlines the best-case scenario for future education and skills development, based on the implications of the identified trends that were validated through the survey and discussed in the workshop. Finally, **Chapter 5** describes the next steps, focusing on the process that will translate the foresight results into strategic recommendations for the SRIA.

2. Strategic Foresight: Our Process at a Glance

This chapter outlines the foresight process that guided our exploration of the future of education and skills development, with a particular focus on stakeholder engagement and methodological transparency. Our approach combined structured desk research with participatory formats to identify, validate, and interpret trends likely to shape the world of skills and education over the coming 10-15 years. Experts from across Europe and beyond were actively involved at every stage – from trend collection and validation to the co-creation of implications and scenarios. **The process drew on insights from 132 survey respondents in 22 countries, six expert interviews, and a trend workshop involving 32 participants.** These contributions reflect a broad geographical and disciplinary base, ensuring that the resulting trends and scenarios are informed by diverse experiences and perspectives including those of academia, public authorities, funding bodies, social partners, the private sector and non-profit organisations. The following sections summarise each step in this process: trend collection, online survey, expert interviews, trend workshop, and scenario development.

Figure 1: Our Process at a Glance



2.1 Trend Analysis

The first step in our foresight process focused on identifying key trends shaping education and skills development in the next 10-15 years. The aim of this phase was to establish a robust, evidence-based foundation for the subsequent steps. By mapping existing knowledge and anticipating potential drivers of change, we sought to build a shared understanding of how education and skills may evolve over the coming decade.

The trend collection was conducted through **systematic desk research**. Drawing on a wide range of sources, we analysed recent foresight studies, academic literature, institutional reports, and policy documents. Sources included the European Commission's (2020) *Digital Education Action Plan*, the OECD's *Skills Outlook* (2023), *Digital Educations Outlook* (2021), and *Education Policy Outlook* (2023b), WEF's Future of Jobs Reports (2023 & 2025), or Cedefop's *Skills in transition – the way to 2035* (2023).

From this wide base of literature, an **initial longlist of 26 trends** (see ANNEX) was compiled. Each trend reflected a direction of change – either emerging, accelerating, or evolving – with relevance to education and training systems, changing skill demands and training requirements, access to education, educational attainment, gender imbalances in educational fields and skill divides or skill development over the lifecourse. Rather than restricting ourselves to one pre-defined model, we used a flexible categorisation approach, grouping trends thematically as the research unfolded. **Categories** included

- The Future of Skills Needs in the Green and Digital Era,
- The Future of Education Systems: Adapting to Transformations,
- The Future of Inclusion: Addressing Unequal Access and Outcomes,
- The Future of Learning: What, How, and Where People Learn Is Changing.

The goal at this stage was not to filter or prioritise, but to ensure breadth, relevance, and coverage of diverse perspectives, from labour market demands to interpersonal and cognitive competencies and mental well-being. The result of this first step was a structured trend catalogue, organised to inform the next stage of the process: the online survey. The survey was designed to validate, refine, and add depth to the trend landscape with input from a broad range of external experts. While the desk research provided a grounded starting point, the trend catalogue remained open to revision and expansion as new insights emerged in later phases.

2.2 Online Survey

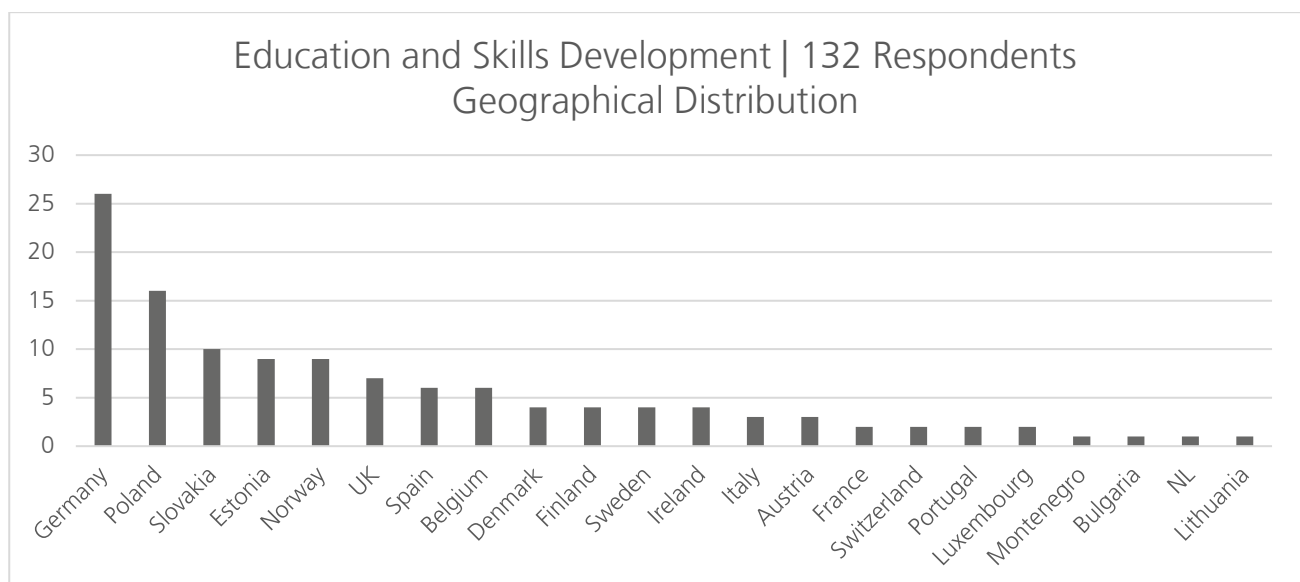
To build on the initial trend collection and ensure its relevance from a broader stakeholder perspective, we conducted an online survey targeting experts in fields such as economy of education (including labour market demands); educational policies; educational psychology (including cognitive studies and child and adolescent well-being and mental health); early childhood, pre-school, primary, secondary and higher education (including inclusive education), vocational training, adult education; curriculum development; teacher training; cultures of education (including philosophy and history of education); inter-cultural education; cultural and creative skills; social stratification in education and educational inequality; lifelong and self-regulated learning; new technologies in learning and teaching (including media didactics and communication and digital literacy studies); human resource management. The survey served four key purposes: to validate the trends identified through desk research, to collect expert feedback and suggestions, to establish a ranking based on perceived impact, and to gather initial reflections on potential implications of each trend.

The survey was conducted in English using the LimeSurvey platform. It included a mix of closed and open questions and took between 5 and 20 minutes to complete, depending on how many trends participants chose to comment on. All responses were anonymous and used strictly for research purposes.

The survey was disseminated through a combination of targeted outreach and open expert identification. Participants were identified via project-related networks (e.g. CHANSE, HERA, NORFACE), the Partnership Drafting Group, and an online search for individuals working on the education and skills with a focus on European countries including but not limited to a comparative perspective. The survey was sent to approximately 280 hand-picked individuals and additionally circulated via targeted mailing lists and expert communities, in particular Social Sciences and Humanities communities. We also reviewed and acted upon suggestions regarding additional individuals or organisations who should receive the survey, forwarding it accordingly where feasible. While – due to the mailing list and expert community circulation - no precise response rate could be calculated, the participant pool reflects a broad and balanced range of disciplinary and institutional backgrounds.

The survey was open from mid-May to mid-June 2025 and received responses from **132 experts across 22 countries**. A majority of participants came from academia, but there was also representation from public authorities, the private sector, civil society, and other types of organisations. Of the 130 respondents who provided gender information, 84 identified as female and 46 as male. The country distribution showed notable peaks in Germany, Poland, Slovakia, Estonia, and Norway, while participation extended across 22 countries overall (see Figure 2).

Figure 2: Geographical distribution of survey responses



The **analysis of survey results** followed a four-step process. First, the trends were ranked based on their mean impact scores. The ten trends with the highest average scores were selected for further analysis, ensuring that the final selection reflected those developments perceived as most impactful for the future of education and skills development. Among these, three dealt with closely related themes – Ethical AI Skills, Increasing Demand for Technical Skills, and the Digital Skills Gap. These were merged into a broader trend, ‘Digitalisation and AI Are Reshaping Skill Demands and Widening Existing Gaps’, to avoid redundancy and ensure thematic diversity in the subsequent workshop. To maintain a **total of ten trends**, two additional high-scoring and thematically distinct trends were selected from the remaining pool:

- Demand for Adult Upskilling Is Rising – but Participation Remains Low (Mean 2.82)
- The Green Transition Is Reshaping Skills Needs Across Sectors (Mean 2.8)

Second, the free text comments associated with each selected trend were analysed. These were used to **refine the wording, clarify ambiguous formulations, and integrate missing nuances**. While no substantive redefinitions

were needed, expert feedback from the free text comments improved the precision and representativeness of the trend descriptions.

Third, we analysed the open-text responses regarding **potential implications of each trend**. These were summarised and categorised into first- and second-order implications, forming a structured foundation for the subsequent scenario development.

Finally, we analysed the responses to the questions asking whether any **trends were missing**. While according to survey participants, no major themes were absent from the original list, relevant nuances were incorporated into the scenario narratives.

2.3 Expert Interviews

To complement the trend collection and survey, we conducted a series of expert interviews. The interviews served **three main purposes**: (1) to discuss and validate key trends identified through our desk research and online survey; (2) to complement the trend landscape with expert insights, including weak signals and overlooked developments; and (3) to explore the implications of these trends for research, policy-making, and society at large.

We interviewed six leading scholars and practitioners working at the intersection of education, labour markets, and social change. These experts represented diverse disciplinary backgrounds including evolutionary linguistics, pedagogy, regional development, management studies, adult education, and digital humanities. They are affiliated with **institutions across Europe**, including the University of Warsaw, University of Limerick, Turku University of Applied Sciences, University of Padua, Tallinn University, and the Bertelsmann Foundation, Gütersloh. Equal gender representation was maintained. The experts' contributions brought contextual nuance to the trend landscape, bridging policy, practice, and academic research (from a social science as well as humanities perspective), and provided valuable insights into long-term structural developments in education and skills.

The interviews were conducted using a **semi-structured guide** designed to ensure comparability while leaving room for open reflection. Each interview lasted between about 60 minutes and was **structured around four thematic blocks**: (1) general perspectives on the future of education and skills development, including long-term developments and overlooked or emerging issues; (2) validation and refinement of selected trends identified in the earlier phases of the project; (3) discussion of implications for research, policy, and societal priorities; and (4) closing remarks and follow-up opportunities. Experts were asked to comment on three trends of their choice, enabling a focused yet flexible exchange based on their areas of expertise (see also Chapter 3).

2.4 Trend Workshop

As the final step in the trend validation phase, an **online workshop was held on 25 June 2025** to deepen the analysis of key trends shaping the future of education and skills. The workshop had **three main objectives**: (1) to validate and enrich the implications of ten pre-selected trends identified through desk research, survey, and expert interviews; (2) to bring together diverse perspectives from across sectors and disciplines; and (3) to generate structured input for the subsequent scenario development process.

Participants

To ensure a diverse and balanced discussion, we initially aimed to engage around 40 participants for the trend workshop. Participants were selected from the pool of experts identified via (1) an online search for individuals working on the future of education and skills development with a focus on European countries including but not limited to a comparative perspective, (2) project-related networks and (3) the Partnership Drafting Group (see 2.2). One of the main selection criteria was professional respectively technical qualification and relevance. Furthermore, in addition to the researchers, the selection reflected a broad range of stakeholders (researchers, policymakers, representatives from social partners, and public administrations).

Ultimately, **32 participants** took part in the Education and Skills workshop, comprising **19 women and 13 men**, and representing **15 countries**, including four from widening countries. Attendees represented a broad spectrum of institutions: **universities** (Padova, Southern Denmark, Frankfurt, Edinburgh, Lapland, Limerick, Coimbra, Krakow, Barcelona), **research institutes** (IHS Vienna, FiBS, GESIS, Institute for Labour Studies, Institute for Research in Social Communication), and **funding bodies** (Arts and Humanities Research Council, Irish Research Council, Swiss National Science Foundation). The group also included representatives from national **ministries** (Education and Research; Labour and Social Affairs), the **European Commission**, and the **European Trade Union Institute**.

Agenda

The online workshop was designed to support structured, collaborative reflection while creating space for in-depth exchange and cross-sectoral insights. The session opened with a short context-setting presentation, introducing the foresight process and presenting the final top-10 trend set. Participants were then divided into five breakout groups, each working with two of the validated trends.

Table 1: Agenda Future of Work Trend Workshop

Time	Agenda Item	Description
10:00	Welcoming remarks	Introduction by the moderators
10:05	Context setting	Introduction to the project with a focus on the Strategic Foresight process & aims of this specific workshop.
10:10	Icebreaker	'What's one thing about education or learning in 2040 that will be completely different from today?'
10:20	Presentation of selected trends	Presentation of the 10 most impactful key trends relevant to the project
10:30	The Futures Wheel	Introducing the Futures Wheel tool and the approach for the Breakout Sessions
10:35	Breakout Sessions	In-depths discussions on two selected trends for each Breakout Session and their implications
11:40	Break	
11:50	Presentation of results	Reporting back key findings and insights
12:55	Closing remarks	Summary of key findings and future outlook
12:00	The End	

To guide the discussions, each group used a **Futures Wheel template** (see ANNEX), i.e. a structured tool for mapping first-, second-, and even third-order implications of a given trend. This method encouraged participants to look beyond immediate effects and explore cascading consequences for learners, organisations, and society. Each group was chaired by an expert and supported by a facilitator, who documented the results.

The workshop format was deliberately designed to foster expert-driven knowledge production. Trends were not explained in detail during the breakout sessions; instead, participants had received preparatory material (incl. the top-ten trends) by email in advance. This allowed the available time to be used primarily for discussion. Each group's results were presented by the expert chairs in a short plenary session following the breakout phase, providing a shared view of the diverse implications discussed. Following the workshop, additional feedback was collected from participants to capture further reflections and ensure that no key insights were missed.

The insights generated during the workshop served a dual purpose. First, they helped to test the robustness of the trends by surfacing overlooked dynamics and boundary conditions. Second, they provided a rich pool of implications that will inform the scenario development process and help translate trends into strategic narratives.

2.5 Scenario Development

Following the trend validation and implications analysis, we developed a desirable scenario for the future of education and skills development. This scenario is grounded in insights gathered across all earlier phases of the process – the online survey, expert interviews, and the trend workshop – and reflects the collective knowledge generated through those engagements. Specifically, it builds on the implications identified for each of the ten key trends, including first- and second-order effects discussed by the experts.

To prepare this input for scenario development, we first filtered out general reflections or comments that were not directly linked to specific implications. We then grouped similar ideas into core thematic clusters and structured them into a hierarchy of effects. The resulting set of first- and second-order implications provided the foundation for constructing a future-oriented, preferred scenario (see Chapter 4).

The scenario reflects a shared vision of what a desirable future of education and skills development could look like, assuming that key challenges are addressed and opportunities are actively pursued. It is not a prediction but a normative orientation that synthesises expert perspectives, institutional knowledge, and stakeholder priorities into a coherent narrative. The goal was to translate trend knowledge into a forward-looking scenario that can guide strategic thinking and inspire policy and research agendas.

This scenario now serves as the basis for the next phase of the foresight process, where pathways, actions, and enabling conditions will be developed to explore how such a future could be realized.

The following two chapters will outline the results of these steps, i.e. the trend collection and the best-case scenario. We deliberately chose to develop a best-case scenario because the backcasting endeavour at the end of the foresight process requires a clearly articulated, desirable future as a reference point for identifying the strategic research and innovation needed to have a corresponding long-term societal, policy and economic impact. As a normative foresight approach, backcasting is designed not to anticipate likely developments, but to support goal-oriented planning.

3. Interview Insights

The results of the expert interviews and workshop discussions were analysed with reference to four guiding sub-questions. First, we examined how participants' input related to the ten trends selected for the workshop, whether they confirmed, nuanced, or questioned specific formulations. Second, we explored whether any additional trends or drivers of change were mentioned that had not been captured in the initial trend list. Third, we identified forward-looking perspectives or normative considerations that went beyond the scope of the ten trends but could meaningfully inform the best-case scenario for education and skills development. Finally, we gathered concrete suggestions for future research, especially where interviewees or workshop participants highlighted knowledge gaps or emerging priorities that may deserve attention in the context of the SRIA.

3.1 Nuancing and Refining the Ten Key Trends

The expert interviews conducted during this foresight cycle provided valuable input for critically reviewing the ten selected trends. Rather than fundamentally challenging the trend list, interviewees largely reinforced its relevance, while offering important nuances and elaborations that deepen the interpretation and point to specific angles that may be emphasised in the scenario (see Chapter 6) and further discussions and documents building on it.

Several interviews confirmed the critical role of **digital transformation** for the future of education and skills. Experts highlighted that digitalisation extends far beyond infrastructure or tools; it reshapes the very fabric of how people work,

learn, and engage with society. Specific attention was drawn to the intersection of digital skills and sustainability, for instance, how AI and data technologies enable sustainable practices like product traceability or smart recycling. These insights reinforce the strategic relevance of digital competencies but also suggest greater emphasis on their cross-cutting, system-wide effects.

In relation to **teacher shortages**, interviewees agreed with this trend's central claim but provided additional perspectives. One expert stressed the long-term decline in teacher autonomy and professional status, arguing that relational, ethical, and emotional aspects of teaching have been systematically undervalued. Another noted a mismatch between societal expectations (e.g. adaptability, innovation) and the current profile of those entering the teaching profession, as teacher training has not been geared to change, adaptability and innovation so far. These perspectives imply that addressing shortages will require more than recruitment, it will demand a reassessment of the role and attractiveness of the teaching profession on which a revision of teacher training can build.

The trend on **gender equity and digital inclusion** was likewise affirmed, but with a call for broader definitions of inclusion. For example, support structures for older educators or underrepresented pedagogical approaches were highlighted as often overlooked. Moreover, the rationale for inclusion should extend beyond workforce participation goals to encompass wider social and ecological goals.

One interviewee commented on the trend addressing **declining core academic skills**, cautioning against an overemphasis on short-term skill acquisition at the expense of deep conceptual knowledge and theoretical understanding. The critique also extended to international assessment tools like PISA, which were seen as reinforcing narrow educational goals and overlooking cultural diversity.

A normative dimension emerged in the discussion of **soft skills**, where the future importance of dialogue, debate, and critical thinking was framed not just as a labour market need, but as a societal necessity. These skills were seen as crucial for counteracting polarisation, preserving democratic dialogue, and fostering civic resilience in the face of algorithmically driven media environments.

3.2 Additional Trends Highlighted by Experts

While the ten selected trends were broadly validated by interviewees, several conversations pointed to additional developments and tensions not fully captured in the existing trend framework. These emerging or underexplored issues may serve as input for future foresight cycles, scenario refinement, or the broader SRIA process.

One recurring theme concerned the **increasing diversification and fragmentation of public educational provision**. Interviewees observed a growing number of alternative models (such as homeschooling, private schooling, or non-formal education) that are gaining traction, particularly where public systems are perceived as slow to adapt. This trend is closely linked to broader dissatisfaction with traditional education and may have significant implications for access, equity, and system coherence.

Another expert highlighted **reform fatigue and the lack of political consensus** as an unaddressed but critical issue. Especially in some Central and Eastern European countries, education policy is marked by a proliferation of overlapping or incomplete reforms. The absence of a long-term, shared vision for education contributes to systemic instability, and may act as a barrier to implementing more future-oriented strategies.

A third interview pointed to the **narrowing of educational discourse**, particularly the trend towards deterministic, evidence-based and 'clinical' models that sideline philosophy, ethics, and the social sciences. This was described as undermining the democratic, relational, and human development dimensions of education. While loosely related to trends on soft skills or civic education, this critique points to a deeper epistemological shift with potentially far-reaching consequences.

One expert formulated a new trend highlighting the **broader cultural impacts of technological immersion**. Intelligent technologies are becoming ever more present in the lives of citizens. Intelligent technologies are expected to transform and replace a significant share of work. Research on values indicate that the associated uncertainty could on the

long-run promote a values-base that makes societies less innovative and more xenophobic. This effect may be exacerbated by people spending an increasing amount of time on devices and platforms that polarise opinions by creating social echo chambers for unchallenged opinions (Inglehart 2018; Långstedt 2021; Långstedt et al. 2023).

Finally, the **tension between market-oriented and civic goals of education** was raised as a fundamental question shaping future trajectories. While some trends focus on employability and labour market needs, others reflect broader societal objectives. The interviews suggest this underlying tension could itself be conceptualised as a meta-trend, framing how education and skills development are imagined and governed in the AI era.

3.3 Forward-Looking Perspectives Beyond the Ten Trends

The interviews offered valuable forward-looking perspectives that extend beyond the ten selected trends and can enrich the normative scenario. Several experts emphasised the **importance of authenticity and values-based behaviour** as a foundation for successful transformation processes. They argued that long-term change depends not only on skill acquisition, but also on individuals' ability to internalise goals such as sustainability and to act on them within their professional and institutional contexts. This perspective highlights the role of organisational culture, identity, and personal motivation in enabling effective transitions.

One recurring theme was the **declining trust in public education systems**, which was not among the final trends but emerged as a key concern. The erosion of confidence among students, parents, and teachers was seen as a structural challenge that could undermine reform efforts and should be acknowledged in the scenario. Related to this, one expert contrasted two potential future trajectories: one based on long-term political consensus and stability, and another marked by increasing fragmentation and diversification of educational provision. These competing dynamics raise questions about equity, coherence, and inclusiveness in future education governance.

The interviews also added a **cultural and civic dimension** to lifelong learning. One expert raised concerns that automation and digital immersion may gradually foster values such as intolerance of uncertainty or resistance to change—developments that threaten innovation and social cohesion. This underscores the role of lifelong learning not only in equipping individuals for the labour market, but in cultivating civic capacity and resilience. In this context, critical thinking was highlighted as a key competence to safeguard democratic discourse and counter algorithmic manipulation.

Moreover, it is increasingly recognised that community-based learning ecosystems, encompassing local networks, peer support groups, community centres and informal learning initiatives, play a vital role in fostering inclusive digital competence development; integrating these community dimensions as co-creators of learning pathways can bridge equity gaps, enhance learner motivation and ensure the sustainability of digital education programmes.

Finally, the interviews provided **normative input** that could shape the scenario narrative. This includes a relational and ethical view of education that foregrounds care, affective labour, and critical reflexivity; an emancipatory vision of learners as active subjects in lifelong ethical and civic development; and a renewed emphasis on pluralist, democratic, and humanising approaches to education as a basis for sustainability and social cohesion.

3.4 Suggestions for Future Research

The interviews generated several forward-looking ideas that could inform the design of future research agendas. One expert highlighted the need for more interdisciplinary research, arguing that education policy and practice are often disconnected from broader insights in economics, sociology, and political science. He noted that much of the current research is too narrowly focused on didactics and lacks relevance for structural or systemic reform. Another expert emphasised the importance of studying scaling mechanisms, proposing that research should not only examine successful small-scale innovations, but also how these can be transferred into mainstream practice. This also involves analysing the long-term consequences and trade-offs of different reform strategies, rather than merely diagnosing current problems.

In addition to these strategic reflections, the interviews yielded a number of specific research proposals, including:

- Psychological barriers to transformation, particularly in relation to climate adaptation and digitalisation
- The human-machine interface, with a focus on designing interactions that are both acceptable and complementary to human capabilities
- Leadership during systemic change, especially the role and mindset of middle management
- The role of authenticity in sustainability leadership, including the alignment of personal and organisational behaviour
- Research on critical reflexivity as an ethical and feminist educational practice
- The reintegration of humanities, arts, ethics, and social sciences into curricula and education policy
- The unintended consequences of standardisation, particularly in teacher education and performance assessment
- Research on the decline on students' well-being
- Research on youngsters on transition from childhood to adulthood (problems encountered when young people are seen as adults, but do not yet fit in)
- Problems associated with demographic decline

4. Trend Collection: Education and Skills Development

This trend collection is the result of a mixed method foresight process comprising desk research, expert interviews, an online survey, and a trend workshop. Overall, the future of education and skills development is shaped by technological, demographic, economic, and societal transformations. Digitalisation and the rapid spread of AI are changing what learners need to know and how they acquire knowledge, while the green transition is reshaping the competences required across all sectors. At the same time, demographic decline, teacher shortages, and social inequalities are placing mounting pressure on education systems. Mental health challenges among young people and the growing demand for social and emotional skills are further redefining what schools and universities are expected to deliver. These developments affect not only individual learning trajectories, but also the resilience of societies, their ability to adapt to transitions, social cohesions, and democratic life in Europe.

The ten trends presented in this chapter were selected through a multi-step foresight process. An initial set of 26 trends was identified through desk research. These were then discussed in a series of expert interviews, which helped nuance their interpretation, highlight overlooked aspects, and situate them within broader institutional and societal contexts. Building on this input, the full set of 26 trends was presented to respondents in an expert survey asking the participants to prioritise those ten trends they considered most significant.

4.1 Increasing Teacher Shortages

Nearly all EU countries are now grappling with teacher shortages, driven by an aging workforce and declining interest among younger generations (QUEST 2023). Eurostat data (2023) show that 40% of teachers are over 50 years old, while only 8% are under 30. Without policy intervention, the European Commission expects a 'dramatic increase in reported teacher shortages' in the coming years (QUEST 2023).

This growing gap is not only numerical, but also stems from deeper structural issues. The attractiveness of teaching as a career has been undermined by high workloads, limited professional autonomy, rigid institutional hierarchies, and - in

some countries and depending on the type of educational institution - low salaries. Consequently, many graduates either avoid entering the profession altogether or leave it prematurely. These shortages are particularly acute in underfunded adult education and disadvantaged regions, where they risk exacerbating existing educational inequalities.

At the same time, rising societal expectations, such as, e.g., demands for digital, emotional, and inclusive teaching skills, are mismatched with the actual support and working conditions available. The pressure to standardise and measure performance risks side-lining the relational and pedagogical core of the profession, contributing to widespread reform fatigue. These dynamics are further aggravated by broader societal developments, including the long-term social effects of the COVID-19 pandemic, ongoing demographic and technological change, economic decline, and geopolitical instability (Binder 2024).

4.2 Digitalisation and AI are Reshaping Skill Demands and Widening Existing Gaps

Digitalisation and the rapid adoption of AI are transforming the skills landscape, placing mounting pressure on education and training systems across Europe. The demand for digital and data-related competencies is accelerating in nearly all sectors; and not only in traditionally high-tech fields, but also in areas such as logistics, agriculture, and manufacturing (WEF 2025: 6; Alvarez 2025). According to the World Economic Forum, 60% of workers will need training by 2027 to keep pace with evolving job requirements, and nearly 40% of existing skill sets are expected to become obsolete or significantly transformed by 2030 (WEF 2023: 38; WEF 2025: 6).

Education systems are struggling to keep pace with this transformation. Many still rely on static curricula and traditional pedagogical models that fall short of equipping learners with future-relevant digital and transversal skills (Kiss 2021: 5). Experts note a growing mismatch between the skills needed in a digital society and those taught in schools, further exacerbated by uneven teacher preparedness and persistent gaps in access to training, especially for older adults, low-income learners, or those in non-academic educational tracks.

Beyond technical know-how, skills such as critical thinking, ethical judgment, and data literacy are increasingly vital. Yet ethical questions surrounding AI remain largely absent from mainstream education. An OECD (2023: 17) review found that fewer than 1% of AI-related job postings in 12 of 14 countries referenced ethical competencies, highlighting a strong disconnect between emerging societal needs and current educational priorities.

This trend points to a systemic challenge: Education systems must not only integrate digital and AI-related skills more effectively, but do so in a way that promotes equity, democratic resilience, and a human-centred approach to technological change.

4.3 Technology Is Transforming *How* People Learn

Technology is fundamentally changing how people engage with learning: What they learn, how they access it, and how it is structured. AI-powered tools and smart learning platforms increasingly allow educational content to be tailored to individual needs, adapting in real time to different learning styles, paces, and preferences (OECD 2021: 31). This shift enables more personalised and self-directed learning experiences, breaking away from one-size-fits-all classroom models. At the same time, the structure of learning is evolving. Modular formats and micro-credentials allow learners to stack easily adaptable sets of educational achievements including domain-specific as well as transferable skills and thus build flexible competence profiles across formal and informal settings (OECD 2023c: 31).

Hybrid learning (i.e. combining online and in-person formats) has become more widespread, accelerated by the COVID-19 pandemic and changing learner expectations. In response, many countries are investing in digital infrastructure and training for hybrid teaching models (OECD 2023b: 43). Digitalisation is also enabling more collaborative and cross-border learning. EU initiatives like blended mobility under Erasmus allow learners and educators to engage in joint projects across countries, strengthening both digital and intercultural competencies (European Commission 2020). Together, these developments are reshaping not only where and when learning happens, but also its format, structure, and social dimension, pushing education systems toward greater flexibility, personalisation, and connectivity.

4.4 Student Mental Well-being Is Declining

Adolescent mental health has deteriorated significantly in recent years. According to the European Commission (2024), young people today report poorer emotional well-being than previous generations. The latest PISA results reflect not only a decline in basic skills but also a growing share of students struggling emotionally. Between 2015 and 2022, the proportion of 15-year-olds reporting low life satisfaction rose from 12% to 18%, while those expressing high satisfaction fell from 36% to 26% (OECD 2025).

Several drivers contribute to this decline. Within schools, peer relationships and emotional support are weakening, while socio-emotional learning remains underdeveloped and educational achievement dominates priorities. Outside of schools, new stressors such as digital overexposure, cyberbullying, poor sleep, and social media pressures have intensified, compounded by pandemic-related disruptions to social networks (Sorrentino et al., 2023; Hale et al., 2025).

Declining well-being has direct consequences for education. Enjoyment of learning, self-efficacy, motivation, and test anxiety are strongly linked to performance (Govorova et al., 2020) – yet most schools lack the capacity to address these issues. Because many stressors extend beyond the school environment, tackling the crisis in student well-being will require a broader, cross-sectoral response.

4.5 The Twin Transition is Deepening Socioeconomic Skill Divides

As societies undergo the digital and green transitions, long-standing socioeconomic inequalities in education are being reinforced and, in some cases, deepened. The OECD (2023: 17) notes that individuals from disadvantaged backgrounds are 'less likely to gain proficiency in a range of skills during formal education, develop attitudes and dispositions that can support the twin digital and green transition, and reduce their vulnerability to environmental and technological changes'. In other words, the benefits of the twin transition are not being shared equally.

In the digital transition, gaps in digital skill acquisition are evident. Students from low socioeconomic backgrounds have less access to high-quality digital infrastructure, fewer learning opportunities to build ICT proficiency, and are less likely to be supported in developing the flexible learning habits and mindsets that digital societies demand (OECD 2023: 64). These disparities contribute to a growing skills divide, leaving disadvantaged learners poorly equipped to participate in digital labour markets and civic life.

A similar pattern is visible in the green transition. OECD data (2023: 38–40) reveal that students from socioeconomically disadvantaged households are significantly less likely to achieve basic science proficiency, be aware of or concerned about environmental issues, feel confident in their ability to address sustainability challenges, engage in sustainable behaviours such as recycling or saving energy. Strikingly, only 21% of 15-year-olds from disadvantaged backgrounds attain foundational competence in environmental sustainability, compared to 46% of their more advantaged peers (OECD 2023: 39). These figures point to a structural inequality in how education systems are preparing students to cope with and contribute to ecological change.

4.6 Social and Emotional Skills Are Gaining Importance

As technology reshapes the world, the demand for social and emotional skills (including communication, teamwork, empathy, adaptability, and leadership) is rising across virtually all sectors. They are essential for navigating collaborative, dynamic, and hybrid work environments (Yang 2024). Social and emotional skills (SES) enable individuals not only to interact effectively with others, but also to manage their own emotions and navigate uncertainty. These skills, however, increasingly prioritised by knowledge-based and service-oriented employers to foster better collaboration, resolve conflicts, and create supportive work environments (Lynn et al. 2023: 49).

This trend is driven by both the spread of AI (which automates routine tasks and makes human interaction more valuable) and the post-pandemic shift toward remote and hybrid work settings, where effective interpersonal collaboration is crucial.

Although SES often develop outside formal education, schools and universities remain critical environments for fostering them, especially for students who lack supportive conditions at home. Yet current education systems frequently fall short, as SES are still insufficiently integrated into curricula and teacher training. Stakeholders highlight how trends like digital individualisation and limited peer interaction may even erode these skills among younger generations. Beyond their relevance for employment, SES are essential for resilience, collaboration, and civic engagement, making their systematic development not only an economic priority, but a cornerstone of social sustainability.

4.7 Demographic Decline Is Straining Education Systems

Across many European countries, especially in Central and Eastern Europe, demographic decline is emerging as a structural challenge for education systems. Falling birth rates, ageing populations, and high levels of youth emigration are leading to smaller school-age cohorts, shrinking enrolments, and increasing pressure on institutional viability.

The European University Association (EUA) reports that demographic change is now one of the most pressing concerns for higher education institutions, particularly in some of the less R&I advanced so-called 'Widening' countries (European Research Executive Agency 2025) such as Croatia, Latvia, and Poland. In Poland alone, student numbers in Krakow have declined by nearly 40% over the past decade, while in Lithuania, enrolment has halved since 2008 (Drumm 2024). More broadly, the UN note that nine of the ten fastest-shrinking populations worldwide are in Central and Eastern Europe, and the European think tank Bruegel projects a 20% drop in the under-20 population by 2050 in several EU countries, including Latvia, Lithuania, Bulgaria, and Romania (Pinkus & Ruer 2025, European Commission 2024b).

These demographic shifts pose profound risks for education systems. In rural and less-populated regions, declining student numbers lead to underused infrastructure, staff surplus, and reduced public investment (Pinkus & Ruer 2025; European Commission 2024b). Applied sciences universities and vocational training centres are particularly vulnerable, as they rely heavily on local student intakes and are less internationalised than major research universities. The downturn not only undermines institutional sustainability but also threatens to deepen regional inequalities, weaken research ecosystems, and accelerate brain drain as young people leave for more dynamic labour markets abroad.

4.8 Lifelong Learning Is Gaining Strategic Importance¹

Lifelong learning is increasingly recognised as a strategic necessity in response to demographic change, particularly in ageing societies where longer working lives and the shrinking of the traditional labour force demand continuous upskilling and reskilling. At the same time, technological advancements and the twin transitions are transforming job profiles across sectors. These overlapping dynamics require adaptable, future-ready workers.

As a result, investment in lifelong learning and continuous professional development is growing. While some learning needs are cross-cutting, such as digital literacy, adaptive thinking, or collaborative problem-solving, others are domain-specific, including skills for climate-neutral technologies, AI integration, or resource-efficient production. Programmes increasingly target mid-career professionals and are delivered through diverse formats such as online platforms, micro-credentials, workshops, and workplace-based learning.

Beyond these economic and strategic imperatives, lifelong learning also holds inherent and humanistic value. The process of learning nurtures curiosity, critical reflection, and a deeper understanding of oneself and the world. It contributes to personal growth, civic engagement, and well-being. Learning to learn, the ability to acquire and adapt knowledge,

¹ This trend has been refined by members of the Drafting group following the trend workshop. Interview partners, additionally, pointed out that while lifelong learning is widely recognised as a strategic necessity, implementation remains uneven across countries. They also cautioned against a narrowing of lifelong learning to labour market adaptation, emphasising the importance of maintaining its humanistic dimension, including personal development, global citizenship, and socio-emotional competences.

fosters resilience and empowers individuals not only to navigate change but to shape it meaningfully, both in their professional and personal lives.

4.9 Adult Upskilling Rates Remain Low

Although the twin transition is rapidly reshaping labour markets, adult participation in upskilling and reskilling remains insufficient. Despite a growing array of training opportunities offered through Erasmus+ programmes, public VET institutions, and universities, participation is still far below policy targets. The European Pillar of Social Rights Action Plan sets an ambitious goal of 60% annual participation in training by 2030, yet most EU countries remain well below that benchmark.

OECD data (2025b: 14) show that only around four in ten adults engage in formal or non-formal learning for job-related reasons. Even as participation has shown a slight upward trend, growth has been slow and uneven across regions and socioeconomic groups. In many cases, those who most need to upskill, such as workers in declining sectors, are the least likely to do so. A further challenge is that around one-fifth of the adult population in Europe still lacks fundamental skills, limiting their capacity to engage in training and undermining resilience in daily life as well as in work.

Persistent barriers hinder broader participation. Time constraints, financial costs, lack of childcare or flexible formats, and weak employer support remain key obstacles. Interview partners also noted cultural and personal dimensions, such as low motivation and limited educational traditions in some countries. In addition, upskilling is often narrowly equated with professional upgrading, while broader social and civic competences are overlooked.

Without broader uptake of adult learning, particularly in mid-career phases, Europe risks widening labour market mismatches. A workforce unable to reallocate from shrinking to growing sectors limits the effectiveness of both the green and digital transitions and undermines goals for resilience, inclusion, and economic competitiveness. More fundamentally, neglecting adult education weakens social participation and everyday well-being, particularly for vulnerable groups that remain underserved in many systems.

4.10 The Green Transition is Reshaping Skill Demands

The green transition is reshaping skill demands across nearly all economic sectors. As countries implement decarbonisation strategies and shift toward sustainable production, the need for both specialised green skills and broader transversal competencies is growing. According to the OECD (2023), skills related to energy efficiency, renewable energy generation, waste reduction, and clean technologies are increasingly sought after across industries, not only in the energy sector but also in construction, waste management, agriculture, and transport (Cedefop 2023: 14).

This shift is accompanied by the introduction of new equipment and production processes aimed at reducing emissions and improving resource efficiency. Workers are expected to operate and maintain smart infrastructure, including smart grids, hydrogen networks, and carbon capture systems. According to BusinessEurope (2021: 6), this requires upskilling in areas like data analysis, system integration, and digital monitoring, as well as know-how in circular economy models and sustainable design.

However, several experts caution against reducing the green transition to a purely technical skills agenda. Stakeholder input highlights that green skills are not always entirely new skills; often, they involve reorienting existing skills toward new challenges, such as applying engineering, design, or logistics expertise within sustainable frameworks. Moreover, addressing ‘wicked problems’ like climate change calls for integrated skill sets that blend technical, social, and ethical dimensions.

Beyond skills, the green transition demands a sustainability mindset, encompassing values such as interdependence, responsibility, and care for future generations. As one stakeholder noted, education must support not only employability but also eco-literacy and ethical awareness, helping learners make sense of complex sustainability systems and societal trade-offs.

5. First- and Second-Order Implications

The ten prioritised trends presented above do not occur in isolation. Each one sets in motion a chain of ripple effects that shape the wider education and skills landscape. These dynamics were captured by identifying and discussing the implications through the online survey, expert interviews, and the trend workshop. Related ideas were clustered thematically and structured into first-, second- and third-order effects. This mapping formed the analytical basis for the best-case scenario presented in Chapter 6.

1. Increasing teacher shortages

First-order implications	Second-order implications	Third-order implications
Worsening student–teacher ratios in many regions	Decline in instructional quality and teacher-student engagement	Increased learning achievement gaps Reinforcement of intergenerational poverty cycles Disadvantaged students are disproportionately affected
	Greater reliance on private tutoring by wealthier families	Increased inequality
Worsening work environments leading to burnout, stress, and lack of support causing further teacher attrition	Loss of experienced educators and institutional memory	Slower innovation in teaching practice and system reform
	Higher burden on new and early-career teachers	Loss of mentorship quality and pedagogical innovation
		Policy paralysis and populist backlash in education reform
		Declining attractiveness of the teaching profession Fewer talented individuals choose teaching careers
	Declining job satisfaction	Increased dropout from the profession
Inequitable teacher distribution (urban vs. rural, general vs. STEM subjects)	Widening regional disparities in education quality	Increased entry of underqualified or unprepared staff
		Long-term erosion of professional standards and decline in the socialisation of teachers
		Lower student performance in underserved areas Deepening territorial inequalities and reduced social mobility Rural–urban migration pressures and regional infrastructure strain
Expanding responsibilities and expectations for teachers	Mismatch between actual training and professional demands	
	Accelerated demand for continuous professional development	
	Increased reform fatigue and professional frustration	
Declining autonomy due to higher work burden	Teachers feel reduced ownership over curricula and pedagogy	Narrowing of curricula to measurable outcomes only Reduction in critical thinking and civic/ethical education
	Rising disengagement and emotional withdrawal	Loss of education's ethical and relational function

	Public schools lose appeal, strengthening privatisation trends	
Emergence of private education markets	Socioeconomic divides in learning opportunities expand	Privatisation leads to fragmentation of shared societal values
	Public trust in educational institutions declines	Emergence of unregulated or depersonalised learning spaces (e.g. platforms, influencers)
Decline in systemic education quality	Weaker foundational skills among future workers and citizens	Weakening trust in democratic institutions
	Long-term risks to democratic participation and societal cohesion	
	Greater reliance on digital tools and platforms to fill teaching gaps, with unclear quality impacts	Risk of decrease in critical thinking

2. Digitalisation and AI Are Reshaping Skill Demands and Widening Existing Gaps

First-order implications	Second-order implications	Third-order implications
Structural transformation pressures on education systems	Curricula shift toward digital, data, and interdisciplinary competencies	Traditional subject silos are challenged by hybrid skill demands
		Certification systems must adapt (e.g. micro-credentials, modular learning)
	Pedagogical models adapt to integrate AI as both tool and subject	
	Need for large-scale teacher training and infrastructure upgrades	
	Education must prepare learners for unknown future professions	
	Risk of system lag deepens inequalities between education types and regions	
	Emphasis on employability risks displacing education's civic, cultural, and ethical purposes	Reduced space for arts, humanities, and critical reflection in curricula
Rising demand for digital, data, and hybrid skill profiles	Lifelong learning becomes a structural feature of employment	
	Greater demand for modular, flexible, and in-work training models	
	Employers face pressure to deliver firm-specific and inclusive upskilling	
	Growing labour market premium on AI, data, and cybersecurity skills	Salary inflation in tech fields exacerbates cross-sector skill shortages

	Need for interdisciplinary profiles combining digital and domain expertise	Educational institutions must foster cross-sector innovation skills
	Transversal skills (e.g. critical thinking, communication, ethical reasoning) become essential complements to digital skills	Training and assessment systems must integrate both cognitive and social-emotional learning
		Risk of narrowing focus to technical skills alone increases unless explicitly countered
Widening digital divides and access inequalities	Older workers, low socioeconomic status youth, migrants, and rural learners face exclusion	
	Regional and sectoral disparities in training and opportunity deepen	
	Re-entry into the labour market becomes harder for excluded groups	Risk of long-term unemployment, especially in transitioning regions
		Intergenerational poverty and political disaffection may rise
Fragmentation and polarisation of labour markets	Women remain underrepresented in digital careers	Gender gaps in income and job mobility persist or grow
	Rise of high-reward, tech-dense professions vs. stagnating sectors	
	Workers without digital skills face dequalification and job loss	
Amplifying ethical and societal risks	Some are pushed into digital precarity (e.g. platform work, gig AI tasks)	Social cohesion and workforce solidarity are weakened
	AI systems reinforce bias, opacity, and misuse without proper guardrails	Public trust in institutions and digital systems erodes
	AI overreliance displaces human judgement in critical domains	Poorly governed systems trigger reputational and legal risks for institutions
	Ethical competence is marginalised in mainstream education and hiring	Lack of 'AI ethics by design' expertise increases societal harms
	Power asymmetries grow as global tech companies shape standards, access, and outcomes	Local innovation ecosystems may be stifled
		Citizens become data sources without participating in value creation
		Strategic dependence on non-EU digital providers undermines sovereignty

Emergence of new civic and psychological risks	Citizens experience digital fatigue and reduced agency	
	Social polarisation and echo chambers deepen	
	Vulnerability to manipulation (e.g. fake news, deep fakes) rises	Civic disengagement and trust erosion threaten democratic stability

3. Technology Is Transforming How People Learn

First-order implications	Second-order implications	Third-order implications
Personalised, AI-supported learning models are becoming mainstream	Learners engage at their own pace, increasing motivation and individualisation	
	Shift toward individualised learning may reduce peer interaction	Loss of social learning experiences and teamwork skills
	AI-assisted tools (e.g. writing, tutoring, feedback) become integral to daily learning	
	Generative AI acts as on-demand assistant, raising questions about learner agency	Overreliance on AI could reduce cognitive effort and self-regulated learning
	Learning extends beyond traditional hours, often into leisure time	
	Digital formats shift assessment models (e.g. shorter theses, competency-based proof)	
Modular, flexible learning formats are accelerating upskilling	Micro-credentials, short courses, and online modules gain prominence	Traditional degree formats become less dominant
	On-demand learning supports continuous reskilling throughout careers	
	Modular formats support re-entry and mid-career learning	
	Skill acquisition becomes more focused and fragmented	Expertise areas narrow; holistic understanding may decline
Institutions and curricula are adapting to labour market shifts	Curricula increasingly align with emerging job profiles and technologies	
	Universities position themselves as lifelong learning hubs	
	Business–education partnerships gain influence in shaping learning content	
	Project-based and work-integrated learning expand	Students gain more real-world, applied skills
Educator roles and capacities are being redefined	Teachers shift from knowledge providers to facilitators of tech-enhanced learning	
	Educator selection and training models evolve to include digital pedagogy	
	Need for educators who can integrate AI tools and maintain ethical standards is increasing	

	Value of 'skillful educators' re-emphasised — not displaced, but re-framed	Professional identity and motivation may shift as roles evolve
	Use of AI in learning raises ethical concerns	Teachers and institutions may lack guidance on ethical use Learner trust in AI tools may be undermined
Inequalities in access and digital literacy may widen	Learners without access to infrastructure or support are left behind	
	Digital literacy becomes foundational for educational participation	Parallel investments needed in connectivity, guidance, and support services
	Inequalities emerge in who can use advanced learning technologies effectively	Learning outcomes become stratified by digital access and competence

4. Student Mental Well-Being is Declining

First-order implications	Second-order implications	Third-order implications
Student mental distress undermines learning and academic performance	Lower engagement and learning outcomes	
	Higher dropout rates across education levels	Narrower future talent pool for the workforce Reduced national skill supply and innovation capacity
	Decline in cognitive stamina and attention spans	Students increasingly rely on external prompts (e.g. AI) Shift toward shorter or less rigorous academic formats
	Decline in workplace readiness and productivity	
	Reduced student participation in civic and societal life	Growing political withdrawal and social disengagement
Social-emotional disconnection is intensifying	Feelings of loneliness, isolation, and low school belonging increase	
	Rise in anxiety, emotional instability, and school disengagement	
	Decline in social cohesion among youth	Risk of violence and extreme behaviours (e.g. school shootings) Social exclusion and marginalisation of vulnerable students
School systems are unprepared or under-resourced to respond	Mental health remains insufficiently integrated into curricula and teacher training	
	Preventive support structures (e.g. counselling, guidance) are lacking	
	Overemphasis on academic performance sidelines emotional development	Students lack coping and self-regulation skills in tech-rich, high-pressure environments
	Families carry disproportionate emotional and practical support burdens	
	Education systems face rising public health costs	Drop in overall societal productivity and well-being
Unequal impacts amplify systemic disadvantage		Learning gaps and inequalities widen

	Mental health stressors disproportionately affect already vulnerable groups	Long-term labour market access becomes more difficult for affected students
	Decline in student well-being reduces inclusive participation in innovation and education ecosystems	
	Educational decline in disadvantaged groups affects broader social mobility	
Systemic transformation and new approaches are urgently needed	Education must adopt a holistic development approach	
	Policy-oriented, context-sensitive mental health research is needed	Need to define core competencies for resilience and well-being in curricula
	Schools must partner with families, communities, and digital actors	Synergies between school, family, and civil society enable shared support Overuse of tech (e.g. phones, social media) becomes a shared governance issue

5. The Twin Transition is Deepening Socioeconomic Skill Divides

First-order implications	Second-order implications	Third-order implications
Digital and green transitions disproportionately benefit advantaged groups	High-level digital skills are more available to wealthier individuals	
	Workers with digital skills command higher wages	Income inequality increases
	Educational access to emerging fields (e.g. digital twinning) remains limited	Early access leads to cumulative advantage ('Matthew effect', i.e. the rich get richer and the poor get poorer.
	Disadvantaged groups and vulnerable people are underrepresented in green and digital job markets	Poverty cycles persist and upward mobility declines
	Regional disparities widen (especially urban–rural)	
	Rising inequality fuels social tension and political polarisation	Socioeconomic inequalities undermine cohesion and trust in democratic institutions
Education systems face structural pressure to address divides	Growing demand for inclusive learning strategies and outreach programmes	
	Targeted reforms needed to reduce risk of fragmentation in quality and access	
	Failure to adapt could lead to eroding public trust in education as an equaliser	
The twin transition risks slowing due to skills mismatch	Skills mismatch reduces readiness for green and digital labour markets	
	Innovation and productivity gains are unequally distributed or delayed	
	Labour market bottlenecks hinder the overall pace of transition	

Policy complexity increases as equity concerns multiply	Twin transition policies must integrate with welfare, housing, and transport	
	Governments face growing pressure to prevent cumulative disadvantage	
	Skills access policies become politically salient, especially in left-behind regions	

6. Social and Emotional Skills (SES) Are Gaining Importance

First-order implications	Second-order implications	Third-order implications
Education systems face increasing pressure to integrate SES	Curriculum reform is needed to move beyond cognitive testing	
	Teachers must be trained to teach SES alongside academic content	Existing teacher shortages and preparation gaps become more problematic
	Lack of valid, inclusive SES assessment tools slows integration	
	Service and lifelong learning models begin including SES content	
SES become essential for collaboration, adaptability, and leadership at the workplace	Workers without SES face growing labour market disadvantage	
	Workers lacking SES are excluded from high-value jobs	Social mobility declines among those with weak SES backgrounds
	SES mismatches become a key driver of long-term employability gaps	
Unequal SES development exacerbates social and political divides	Children without strong family or school support fall behind socially	Experiential learning in interactive settings is needed to learn emotional stability and openness
	SES gaps reinforce socioeconomic and cultural inequality	Vicious circle of low social recognition, lack of self-consciousness leading to low SES development
	Political disengagement and polarisation increase	Vulnerable youth withdraw from civic and public life
	Digital communication habits may erode natural SES development among youth	
Employers and institutions struggle to adapt to SES demands	Few companies invest meaningfully in SES training	Mismatch between employer expectations and actual worker development
	Informal skills (e.g. emotional labour, caregiving) remain undervalued in hiring	Hiring remains biased toward cognitive or technical qualifications
	Credentialing and recognition systems lack tools to certify SES	
Blurring boundaries between personal and professional spheres	Workers may experience identity stress or authenticity fatigue	
	Organisations struggle to distinguish genuine well-being from performative behaviour	
In the context of the digitalisation of education, SES support the learning success	Education must take care of SES and should be framed as relational rather than technical	

7. Demographic Decline is Straining Education Systems

First-order implications	Second-order implications	Third-order implications
Falling student numbers reduce institutional viability	Underused infrastructure and, in some places, staff surplus, especially in rural areas	
	Mergers, closures, or downsizing of education providers	
	Decline in teaching quality and pedagogical diversity	
	Increased reliance on international (non-European) students to fill gaps	Education systems must adapt to more diverse and non-traditional learners
Public investment in education systems declines	Reduced resources for schools, especially in low-demand regions	
	Fewer funds available for innovation and digitalisation	
	Pressure to shift from intensive ('quality') to efficiency-driven teaching	
	Deprioritisation of public education in favour of private/alternative models	Risk of declining public trust in education systems
	Purpose of education may shift from civic goals toward narrower economic utility	Civic, cultural, and democratic functions of education are deprioritised
Talent outflow and brain drain accelerate as skilled students and teachers migrate to countries with stronger systems		
	Research ecosystems weaken in shrinking regions	
	Widening gaps between national education systems	
	Some countries experience teacher shortages while others receive in-flows	
Educational participation and preparedness change	Learners enter higher education less prepared, increasing dropout risk	
	Recognition of prior learning and adult reskilling gain importance	
	Pedagogical models shift to accommodate more mature or non-traditional students	
	Lifelong learning becomes essential to compensate for tax base shrinkage	
Demographic trends reshape policy and governance	Ageing electorates push policymaking toward pensions and health over education	
	Education becomes more politically contested (e.g. over migration, funding)	
	Education systems pressured to prove short-term economic competitiveness	
	Curriculum reform may target employability over broader social goals	
Institutional competition for fewer students intensifies	Smaller institutions face reputational and financial marginalisation	
	Universities increase focus on international branding and recruitment	

	Concentration of opportunity in metropolitan hubs fuels regional divides	
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8. Lifelong learning is Gaining Strategic Importance

First-order implications	Second-order implications	Third-order implications
Individuals face increasing pressure to continuously update their skills	Workers who do not engage in upskilling risk marginalisation or job loss	
	Mid-career and older workers seek retraining to remain employable	
	Individuals are expected to self-manage their learning needs	People lacking digital skills or guidance are at risk of exclusion
	Learning fatigue and psychological overload may undermine long-term engagement	Lifelong learning strategies will need pacing, support structures, and well-being measures
Employers and labour markets raise expectations for soft and transversal skills	Continuous learning becomes part of job descriptions	
	Informal and non-formal learning gain relevance	
	Companies seek employees with adaptability, communication, and critical thinking	
	Fatigue or resistance may increase if learning is not well supported	
Education and training systems diversify delivery formats and credentials	Online platforms, modular courses, and micro-credentials expand	
	Demand increases for customised, just-in-time content	
	Quality assurance becomes a challenge for decentralised offerings	
Governments and public systems reposition Lifelong Learning as a strategic policy field	Increased public funding and incentives for adult learning	
	Lifelong Learning becomes integral to green and digital transition strategies	
	Outreach and support services become essential to improve access	
	Pressure grows for cross-sectoral coordination (education, labour, industry)	
	Variations in national lifelong learning strategies affect long-term competitiveness and resilience	
Cultural understandings of learning expand beyond formal education	Intergenerational learning becomes more valued	
	Personal growth, well-being, and civic engagement recognised as lifelong learning outcomes	
	Employers and public institutions invest in learning ecosystems beyond classrooms	

9. Adult Upskilling Rates Remain Low

First-order implications	Second-order implications	Third-order implications
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Widening skills mismatch and labour shortages	Recruitment problems for employers	
	Frustration among employers when reskilling fails to deliver work-ready staff	
	Increased economic pressure on declining sectors due to lack of workforce adaptation	
	Reduced labour mobility across regions and sectors	
	Increased unemployment	
	Greater vulnerability to automation and job displacement	
Higher risk of social exclusion for low-skilled adults	Increased marginalisation of certain groups (e.g. low socioeconomic status)	
	Persistent gender disparities in access to upskilling (masculinisation of AI)	
	Lifelong learning remains an elite project in some contexts	Erosion of democratic participation and civic disengagement Increased support for populist or anti-system politics
Widening regional inequality due to varying access to adult learning	Inefficient use of workforce potential in ageing societies	
	Increased reliance on immigration to fill skill gaps in some regions	
Learning cultures remain underdeveloped in some countries	Workplaces remain underused as learning environments	
	Underrecognition of non-formal and informal learning	
Underinvestment in adult learning systems	Low-quality training offers due to lack of standards or quality assurance	
	Low responsiveness of higher education institutions to adult learner needs	
	Pressure on universities and vocational education and training institutions to shift towards microcredentials	
Adults' digital and transversal skill gaps widen	Missed opportunities to leverage adult learning for green and digital transitions	
Mismatch between political expectations and actual upskilling behaviour	Rising public expenditure on social protection	
Early exit from the labour market	could reinforce unemployment or social exclusion	
Decline in competitiveness of national economies		

10. The Green Transition is Reshaping Skill Demands

First-order implications	Second-order implications	Third-order implications
New green occupations emerge, existing jobs are redefined	Obsolescence of qualification systems and legacy job profiles accelerates	

	Green skills bottlenecks limit implementation of sustainability policies	
Skills mismatches intensify between education and labour market needs	Curriculum reform becomes necessary across education levels	
	Reputational or legal risks grow for sectors that fail to meet skill standards	
	Workers in unprepared sectors face higher risk of job loss	
	Green skill shortages could push companies to relocate to regions with better-trained labour pools.	
Demand grows for short, targeted and interdisciplinary training formats	Certification and assessment systems for green skills become more important	
	Traditional qualification systems struggle to keep pace	
Pressure increases on teacher education and in-service training systems	New foresight and support structures are required for training educators	
	Inconsistent teacher readiness creates fragmentation in green skills provision	
Lifelong learning becomes essential to adapt to evolving green job profiles	Late-career workers face growing re-skilling pressure	
	Low participation in adult learning slows sector adaptation	
Transversal skills (e.g. adaptability, systems thinking) gain importance	General education must shift focus toward broader competencies	
	Soft skills training becomes a core component of green vocational paths	
Countries with limited training capacity fall behind in green transition readiness	Economic divergence between early adoptors and lagging regions deepens	
	Regional innovation ecosystems weaken due to talent shortages	
Unequal training access contributes to growing socioeconomic inequalities	Job insecurity rises among low-skilled or transition-lagging workers	
	Unequal outcomes of the transition fuel political discontent	Increased contestation of green policies due to perceived unfairness in access to skills/training Policy backlash in communities experiencing more job loss than opportunity
Innovation slows in regions lacking green-competent professionals	Green transition goals are delayed at regional or national levels	
New civic competencies (e.g. eco-literacy, civic participation) gain value	Pressure grows to embed sustainability education in general curricula	
	Failure to teach civic green skills weakens citizen engagement in the transition	

6. Best-case Scenario for the Future of Education and Skills Development

The implications identified in the previous step were brought together to develop a best-case scenario for 2040. By synthesising related effects into broader themes, the analysis provides a structured picture of how Europe's education and skills systems could evolve under favourable conditions. The scenario outlined here does not predict the future, but illustrates a desirable pathway that will guide the subsequent backcasting exercise.

6.1 A Sustainable, Empowered Teaching Workforce

By 2040, Europe has significantly reduced the pressures that once undermined the teaching profession. Competitive pay, more manageable workloads, and greater autonomy have made the profession more attractive, while better support structures have curbed burnout and turnover. A larger share of experienced teachers remain in the classroom, passing on knowledge through structured mentorship and helping sustain pedagogical quality and innovation.

Persistent shortages in STEM subjects, disadvantaged regions, and adult education have been mitigated through targeted incentives and more balanced distribution policies. While challenges remain, reliance on private tutoring has declined as public schools are once again able to provide reliable, high-quality education for most learners.

Teacher training and ongoing professional development are better aligned with evolving demands, including digital, emotional, and inclusive competences. Protected learning time and clear career pathways give teachers the means to adapt without reform fatigue. Teachers, institutions, and policymakers work together to shape these frameworks, strengthening trust and shared ownership across the system.

Public trust in education has improved. Privatisation and fragmentation have receded, and schools are once again widely recognised as key institutions for social cohesion, civic education, and democratic participation, as well as places of instruction.

6.2 Fair and Responsible Use of Technology in Education

By 2040, digitalisation and AI are widely integrated into European education systems in ways that strengthen equity and agency. Curricula include digital and data literacy, critical thinking, ethical reasoning, creativity, and social responsibility, ensuring that technology supports learning rather than narrowing it to technical skills alone.

Sustained investment in infrastructure and training has substantially reduced earlier divides. Learners in rural areas, migrants, young people from low-income backgrounds, older workers, and women in digital careers now have much better access to digital opportunities. Exclusion from digital learning has decreased, helping to reduce regional disparities and the long-term risk of unemployment.

Teachers are better prepared to integrate AI as both subject and tool. Their role as learning facilitators is supported by expanded professional development, ensuring that human judgement remains central in classrooms increasingly assisted by AI.

Ethical safeguards and European governance frameworks guide the design and use of digital tools. Risks of bias, opacity, and misuse are actively addressed, and dependence on global technology providers has been reduced through stronger local innovation ecosystems. Trust in digital education has grown as 'AI ethics by design' principles have become standard practice.

6.3 Embedding Well-Being and Social Skills in Education

By 2040, European education systems give sustained attention to mental health and socio-emotional development as part of their core mission. Support structures such as counselling and guidance services are more widely available across schools, helping to reduce stress, loneliness, and disengagement that previously undermined learning outcomes and social cohesion.

Social and emotional skills, such as communication, teamwork, empathy, adaptability, are taught alongside academic subjects. Teacher training includes dedicated preparation for socio-emotional learning, and assessment frameworks capture progress beyond cognitive outcomes. These efforts have helped narrow inequalities, with fewer vulnerable students falling behind due to a lack of emotional or social support. Schools also play a stronger role in building resilience for unforeseen disruptions, preparing learners to adapt to challenges beyond predictable transitions.

As a result, dropout rates have declined, civic participation has strengthened, and schools function as stabilising institutions in societies undergoing rapid change.

6.4 Lifelong Learning for All

By 2040, lifelong learning has moved well beyond aspiration and is firmly embedded in practice. Participation rates have risen across age groups and regions, supported by policies that reduce financial, time-related, and accessibility barriers. Gender-sensitive measures and targeted support for disadvantaged groups have improved access to learning opportunities. Workers in declining sectors, low-skilled adults, and other vulnerable groups now benefit from wider reskilling options, limiting exclusion and labour market mismatch.

Quality assurance mechanisms cover a broad range of learning formats, from micro-credentials and modular online courses to workplace training. Recognition of prior and non-formal learning allows skills gained outside traditional institutions to count toward career progression.

Continuous learning is no longer concentrated among the highly educated. Outreach and support structures in communities, workplaces, and local partnerships have made upskilling and reskilling a regular feature of working life. Employers, public authorities, and higher education institutions cooperate to keep training opportunities accessible, relevant, and reliable.

This broader uptake has strengthened labour market resilience, narrowed regional disparities, and contributed to a more inclusive learning culture across Europe.

6.5 Resilient Education in the Face of Demographic Change and the Twin Transition

By 2040, Europe's education systems have adapted more effectively to demographic decline and the pressures of the digital and green transitions. Falling student numbers no longer automatically threaten institutional viability, as schools and universities have restructured through mergers, regional cooperation, and more diversified learner groups, while still maintaining access and quality in rural and shrinking regions.

Curricula at all levels include digital and green skills, combining technical expertise with systems thinking and a focus on sustainability. Teacher training has expanded in line with these changes, supporting a more consistent provision of new competences across regions and institutions.

Targeted investment and support have reduced regional and socioeconomic divides. Learners in disadvantaged or remote areas have greater opportunities to participate in emerging fields, helping to limit the 'double disadvantage' of being both more exposed to transition pressures and less equipped to respond.

This place-sensitive approach has made education a stabilising force, helping sustain local communities, reduce brain drain, and ensure that the benefits of the twin transition are shared more fairly across Europe. Through innovation and

collaboration, education systems are better able to adapt not only to demographic and transition pressures but also to unexpected global challenges.

7. Next steps: Backcasting

Following the completion of all four foresight cycles, we will initiate the next major phase of the process: Translating the developed trend insights and scenarios into steps for developing knowledge, innovative solutions and strategic policy options at European, national, and regional level. This will take place in a backcasting workshop, currently planned for January 2026, which will bring together experts from across disciplines and sectors.

The workshop will start from the four desirable best-case scenarios developed for each impact area. Using the widely established approach of backcasting, participants will work backwards from these desirable futures to today, systematically identifying the necessary steps, enabling conditions, and interventions needed to move towards the envisioned futures. The guiding question will be: What kind of future is imaginable and desirable in each impact area—and how can we work strategically towards achieving it?

Backcasting is an approach that starts by defining a desirable and plausible future scenario. It should be ambitious enough to inspire innovation, but realistic enough that concrete pathways can be identified to reach it. Choosing a preferred scenario helps focus attention on what stakeholders want to achieve, rather than merely reacting to what seems most probable. Starting with a bold scenario encourages more creative thinking, while keeping the steps needed to achieve it grounded and actionable. Backcasting is not about ignoring potential problems; rather, it focuses on overcoming obstacles in a proactive, solution-oriented way, even in the face of uncertainty.

This method allows us to focus not only on what is likely, but on what is possible and desirable, helping to formulate proactive, solution-oriented pathways even in the face of uncertainty. Starting from a bold but plausible scenario encourages all stakeholders to think creatively, while maintaining a realistic view on the steps and conditions needed to achieve these outcomes. Rather than ignoring challenges, the backcasting approach explicitly addresses obstacles, fostering a strategic and action-oriented mindset.

The action steps developed through this process will provide a strong evidence base for the formulation of the SRIA for the European Partnership on Social Transformations and Resilience. Through its innovative Strategic Foresight approach, the SRIA will provide a framework for issues and activities not only for the short and medium term, but also for the long term, allowing for changing needs and iterations.

Glossary

AI: Artificial Intelligence

EUA: European University Association

R&I: Research and Innovation

SES: Social and emotional skills

SRIA: Strategic Research and Innovation Agenda

STEM: Science, technology, engineering, and mathematics

STR: Social Transformation and Resilience

VET: Vocational Education and Training

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ANNEX

Long list of 26 Trends

The Future of Skills Needs in the Green and Digital Era

Captures how the green and digital transitions are transforming the types of skills needed across all sectors, and where gaps are emerging.

1. **Digitalisation is Increasing Demand for Technical Skills Across all Sectors:** Digitalisation continues to reshape job profiles across nearly all sectors, increasing the demand for technical skills such as data analysis, cybersecurity, and software development. The rapid spread of generative AI technologies has intensified this trend, requiring more workers to acquire competencies in AI development and application. Even in basic work sectors, such as logistics or retail trade, or in more qualified, but traditionally low-tech occupations, such as manufacturing labourers or crane operators, medium to high digital skill levels are increasingly required. Agriculture is also undergoing digital transformation through sensor-based technologies and precision farming. These shifts reflect a broader redefinition of baseline competencies across the labour market.
2. **Ethical AI Skills are Increasingly Demanded but Rarely Trained:** Despite increasing awareness of the importance of ethical considerations in artificial intelligence (AI) development, ethical dimensions remain almost entirely absent from both job postings and educational curricula. In 12 out of 14 OECD countries with available data, less than 1% of online vacancies for AI professionals in 2022 mentioned ethical aspects of AI. This suggests a growing misalignment between societal expectations, the potential societal risks of AI, and the actual skill frameworks that guide hiring and training in this field.
3. **The Digital Skills Gap is Growing:** As technology evolves rapidly, workforce training is struggling to keep pace. Employers increasingly seek advanced digital competencies, but many workers, particularly in lower-skill segments, lack access to appropriate training. This mismatch is contributing to a widening digital skills gap across industries, prompting growing calls for large-scale re-skilling and upskilling initiatives. Without adequate intervention, the gap risks undermining both productivity and inclusion in the digital economy.
4. **Social and Emotional Skills Are Gaining Importance:** Skills such as communication, collaboration, critical thinking, adaptability, and emotional intelligence are gaining importance across the labour market. These social and emotional skills are increasingly viewed as complements to technical skills in both traditional and digitalised workplaces. As job profiles become more complex and human-machine collaboration increases, employers value interpersonal and cognitive competencies that enable workers to navigate changing environments and team-based settings effectively.
5. **The Green Transition is Driving Demand for Green and Transversal Skills across Sectors:** The green transition is creating new skill needs in energy, construction, manufacturing, and resource management. Workers must adapt to operate smart infrastructure, apply circular economy practices, and use low-emission technologies. This shift requires large-scale upskilling and reskilling to ensure the workforce can engage effectively with evolving environmental and technological demands.
6. **Lifelong Learning is Emerging as a Key Strategy in the Green Transition:** The green transition requires workers to continuously update their skills as technologies and job profiles evolve. Continuous professional development and lifelong learning are increasingly recognised as essential strategies to ensure the workforce remains agile and equipped for sustainability-related changes. These initiatives target mid-career professionals and sectors affected by environmental policy shifts, offering training on renewable energy, sustainable resource management, and eco-innovation. Programmes often combine technical and soft skills through online courses, workshops, and in-company formats.

7. **Adult Upskilling Rates Remain Low Despite Growing Transition Needs:** Despite the wide availability of digital training programmes offered through Erasmus+, public VET institutions, and universities, adult participation in upskilling remains low. While training uptake is slowly increasing, it still falls far short of the EU's target of 60% annual participation by 2030. Barriers such as time, cost, and low motivation persist; particularly for workers aiming to reskill for new digital or green roles. This limits the overall capacity of the workforce to adapt to fast-changing skill demands driven by the green and digital transitions.

The Future of Education Systems: Adapting to Transformations

Highlights how education and training systems are structurally adapting in response to policy, funding, and transition pressures.

8. **EU Recovery Plans are Boosting Digital Skills Funding:** In the past few years, EU investment in digital skills development has surged to unprecedented levels. Under the post-pandemic Recovery and Resilience Facility, Member States have earmarked €25.7 billion specifically for digital skills and education reform. This massive financial commitment, part of a broader €127 billion digital transformation pack-age, marks a significant acceleration in funding to support the digital transition in education and training.
9. **Educational Institutions Are Mainstreaming Sustainability:** Driven by growing green skill needs, schools, vocational centres, and universities are embedding sustainability into curricula, governance, and training programmes. This includes interdisciplinary climate modules in schools, green-focused updates to VET programmes, and strategic integration of sustainability in higher education. However, implementation remains uneven and often depends on local leadership and capacity.
10. **Educational Institutions Are Scaling Up Digital Capacity:** Schools, VET centres, and adult learning providers are increasingly upgrading their digital infrastructure, training educators in digital tools, and embedding digital literacy as a core subject. Innovations like AI-based tutoring and simulations are gaining traction, particularly in vocational and adult training. While progress is uneven, digital transformation is becoming a structural priority across all levels of education.
11. **Growing Multi-Level and Cross-Sectoral Cooperation to Close Skills Gaps:** Governments across Europe are beginning to coordinate more closely across sectors (education, labour, environment) and governance levels (national, regional, local) to manage green and digital skills policies more effectively. This 'smart governance' approach is increasingly used to break down policy silos and involve diverse actors in shaping skills for the twin transition.
12. **Increasing Teacher Shortages:** Teacher shortages are intensifying across Europe, driven by an aging workforce, low recruitment of young educators, and rising demands on the profession. According to Eurostat, 40% of teachers are now over the age of 50, while fewer than 10% are under 30. The European Parliament highlights that the COVID-19 pandemic, geopolitical challenges, and mounting societal expectations have intensified the strain on the profession, and the European Commission warns that shortages are expected to rise significantly in the coming years.
13. **Demographic Decline Straining Education Systems:** Demographic change is emerging as a serious challenge for education systems across Europe, particularly in Central and Eastern European countries. Shrinking youth populations, combined with high levels of outward migration, are leading to a decline in student numbers and raising concerns about the long-term viability of educational institutions. According to the European University Association's 2024 Trends survey, universities in so-called Widening countries such as Bosnia & Herzegovina, Croatia, Latvia, Lithuania, Moldova, and Poland are particularly affected, citing both demographic decline and emigration as key pressures. These developments are intensifying regional disparities and straining the pipeline of future learners and skilled workers.

14. **Access to Early Childhood Education is Expanding across Europe:** Participation in early childhood education is climbing as Europe sets more ambitious benchmarks. A new EU target aims for at least 96% of children aged 3 and up to attend early childhood education and care (ECEC) by 2030, an increase from the previous 95% goal which has already been achieved in many countries. Efforts are also underway to expand childcare for children under 3 years old, with a target of 45% coverage by 2030, reflecting a broad push to make quality ECEC nearly universal.
15. **Apprenticeships Expanding into Tech and Green Sectors:** Apprenticeships in Europe are increasingly moving beyond their traditional focus on manual trades and into high-growth fields like cybersecurity, fintech, green technologies, healthcare, and education. For example, France saw a 500% increase in healthcare apprenticeship enrolments from 2019 to 2023, reflecting how work-based learning is adapting to meet skill shortages in new industries.

The Future of Inclusion: Addressing Unequal Access and Outcomes

Focuses on how the twin transition interacts with structural inequalities and efforts to broaden participation in education and work.

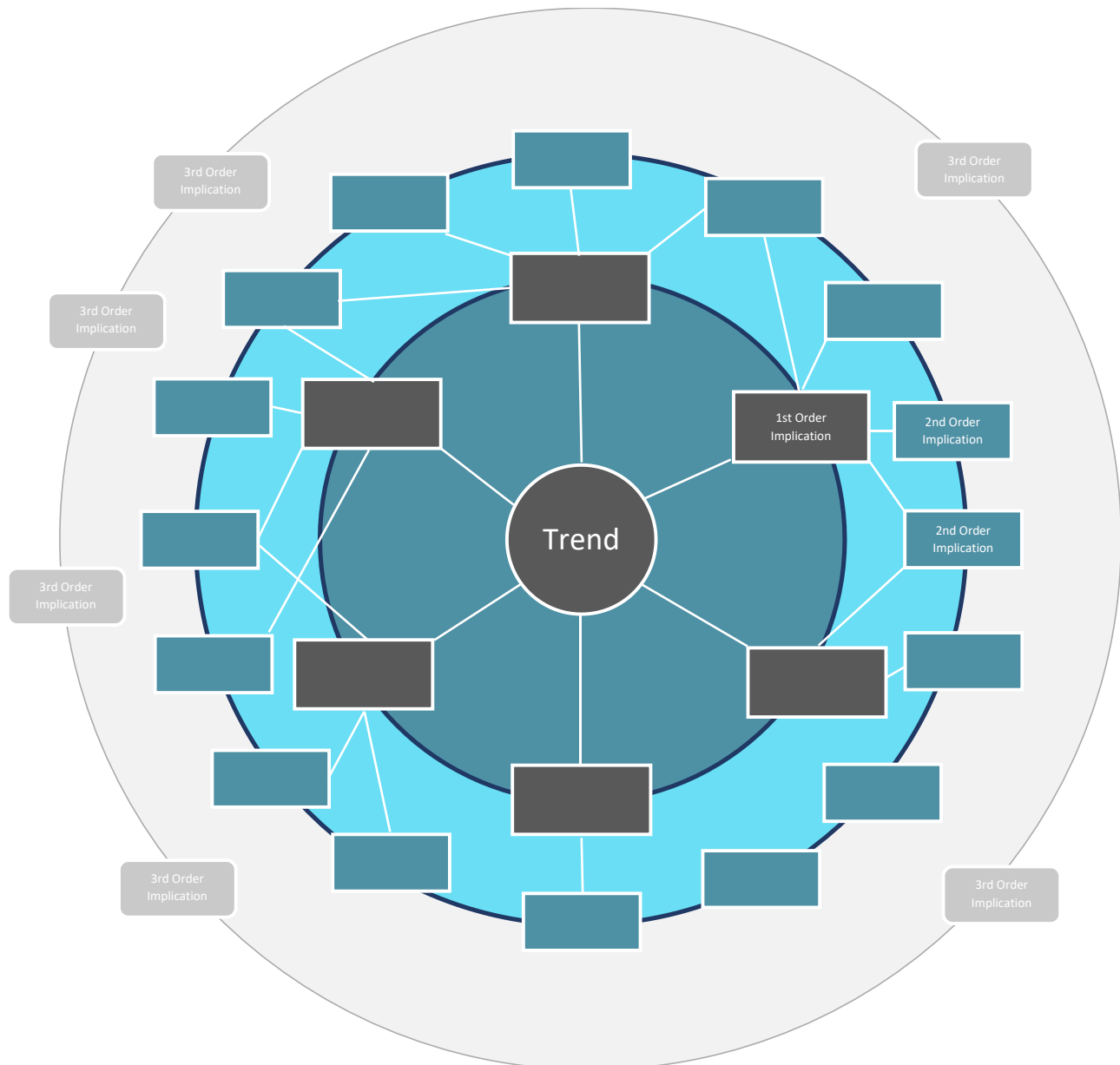
16. **The Twin Transition is Deepening Socioeconomic Skill Divides:** Individuals from socioeconomically disadvantaged backgrounds are less likely to develop the full range of skills needed for the green and digital transitions. Limited access to quality education, digital infrastructure, and training opportunities makes these groups more vulnerable to environmental and technological changes. OECD data highlights that disadvantaged students are significantly less likely to achieve basic science proficiency, show awareness of climate change, or engage in sustainable behaviours. These disparities risk deepening structural inequalities as transitions accelerate.
17. **Digital Inclusion and Gender Equity Efforts are Gaining Momentum:** Targeted initiatives are expanding to improve access to digital education and careers, particularly for underrepresented groups. Women remain underrepresented in engineering and ICT fields, while men are underrepresented in health and education. Addressing these gaps is seen as essential for building an inclusive digital economy.
18. **The Twin Transition is Deepening Gender Inequality in Jobs:** Men and women are benefiting unequally from green and digital labour market shifts. Men are more likely to work in future-oriented sectors, while women are concentrated in roles with fewer upskilling opportunities. Without corrective policies, gender-based segregation in employment risks deepening further, particularly in emerging technology fields.
19. **Student Mental Well-being Is Declining:** Across Europe, student mental well-being is showing signs of decline. PISA and OECD data reveal a worrying drop in basic academic skills and increasing exposure to bullying, both linked to emotional distress in schools. The World Health Organization also reports that today's adolescents experience poorer mental health than previous generations, highlighting the growing urgency to understand and address mental well-being in education systems.
20. **Migration is Increasingly Recognised as a Driver for Transforming Education Systems:** Recent research and experience from both older and newer migration waves (e.g. Ukraine) have begun to shift the discourse on migration in education from crisis response to system transformation. There is growing recognition that multiculturalism and mobility require rethinking educational aims, selection mechanisms, and curriculum structures, not merely integration support. This reflects a nascent trend toward positioning migration as a catalyst for educational reform.

The Future of Learning: What, How, and Where People Learn Is Changing

Covers innovations in how people learn, what they learn, and how environmental conditions are reshaping learning environments.

21. **Technology Is Transforming How People Learn and Train for Jobs:** Education and workforce training are evolving with personalised, flexible, and technology-driven learning models. Industry-academia partnerships play a growing role in ensuring that training programs remain relevant and equip individuals with the skills needed for a rapidly changing job market.
22. **Micro-credentials are Reshaping How People Access Targeted Learning:** Micro-credentials are gaining momentum as a scalable and flexible tool to support upskilling and reskilling. These modular certifications allow individuals to acquire targeted competencies (often digitally) in areas such as data analysis, software development, and cybersecurity. Their rapid uptake in higher education systems, as well as their inclusion in EU-level strategies, signals a growing shift toward more personalised and job-relevant learning pathways that complement traditional qualifications and respond more quickly to labour market needs.
23. **Post-Pandemic Decline in Core Skills:** Core academic skills have declined sharply in many European countries, with recent PISA 2022 results showing an unprecedented drop in student performance. Compared to 2018, average scores fell by 10 points in reading and nearly 15 in mathematics. The decline in maths was particularly severe in countries like Germany, the Netherlands, Norway, Poland, and Iceland, each of which saw score drops of 25 points or more. This marks the most significant consecutive fall in performance ever recorded.
24. **Climate Education Fosters Pro-Environmental Action & Attitudes:** Climate education is associated with shifts in understanding and behaviour. When students and young adults learn about the causes and consequences of climate change in school, they report higher levels of climate literacy and are more likely to engage in pro-environmental actions and civic participation. This indicates that climate education not only builds knowledge but also contributes to long-term sustainability mindsets and democratic engagement.
25. **Climate Change is Beginning to Disrupt the Infrastructure of Schooling:** Climate change is no longer a distant environmental issue for education; it is already altering school infrastructure and operational calendars in parts of Europe. Countries like France, Greece, and Spain are responding to rising temperatures with shorter school days and structural adaptations like air conditioning. These concrete adjustments signal a directional shift in how education systems are forced to adapt to climate-induced environmental stress.
26. **Heat and Pollution are Increasingly Affecting Cognitive Development:** Exposure to extreme heat and air pollution is shown to negatively impact learners' cognitive and behavioural functioning. Skills that depend on working memory, sustained attention, and analytical reasoning are particularly vulnerable to environmental stress. These impacts are most pronounced during complex learning tasks and high-stakes assessments. As climate change increases the frequency and intensity of such conditions, these effects are expected to become more widespread, especially among already disadvantaged student populations.

Futures Wheel Template



Expert Interview Guideline – Education and Skills

1. Introduction

- Duration & Structure: Interview will last 30–60 minutes, covering:
 - General perspective on the Future of Work
 - Trend validation and refinement
 - Implications for future research
 - Closing & next steps

2. General Perspective on the Future of Education and Skills Development

- What do you perceive the most significant shifts shaping the future of education and skills development in Europe?
- Imagine it's ten years from now: What scenarios do you see unfolding regarding the Future of education and skills development?
- Are there any important trends we may have overlooked?
- Have you observed any counter-trends or unexpected/surprising developments?
- What's not yet on most people's radar but should be? Could you highlight any emerging or weak signals that may not yet be widely discussed?

3. Trend Validation and Refinement

Trend #1 & #2 & #3 (chosen by you as expert): Respective questions for each of the selected trends:

- To what extent do you agree with the trend?
- Is this trend accurate and relevant from your perspective?
- Is it overestimated, underestimated, or missing nuances?

4. Implications for Future Research

- How should research in Social Sciences and Humanities address these trends?
- What research priorities do you see to respond to these trends? Where do you see the most critical knowledge gaps?

5. Closing & Follow-up

- Is there anything else you would like to add that we haven't covered?
- Is there anything you should've asked that you didn't?
- Can you name additional experts, who we could contact to interview or engage in the Foresight process?
- Follow-up: Would you be open to reviewing preliminary findings or participating in future discussions?
- Next steps