



Strategic GenAI Education Report (A4)

Consolidated Strategy for GenAI Education: A Youth-Aligned Pedagogical Framework

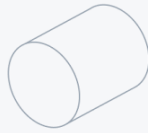
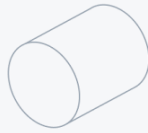


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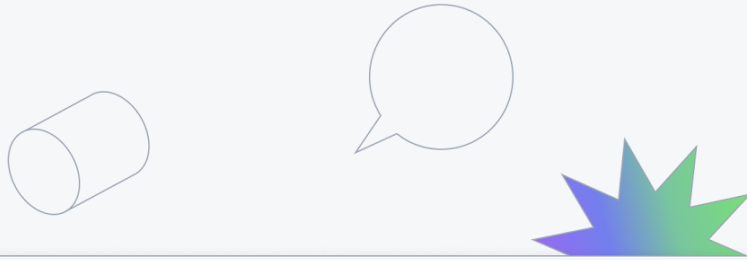
Executive summary

This report presents a consolidated strategy for integrating Generative Artificial Intelligence (GenAI) into youth education across Europe. Drawing on a literature review, stakeholder surveys, and focus group discussions in Poland, Greece, Sweden, and Serbia, the report explores the current educational landscape and proposes a youth-centred, ethically grounded framework for GenAI integration.

The findings reveal that while young people are active users of GenAI tools—especially for academic and creative tasks - their engagement is often informal, unsupported, and lacking in critical or ethical scaffolding. Many youth express both enthusiasm and concern: they value the efficiency and creativity GenAI enables, but worry about over-reliance, misinformation, loss of skills, and algorithmic bias. Educators, meanwhile, report limited training and institutional guidance, and express uncertainty about how to embed GenAI meaningfully into teaching and learning.

In response, the report identifies five strategic priorities:

1. **Digital Inclusion** – Ensure equitable access to GenAI tools and infrastructure, particularly for under-resourced learners and communities.
2. **Critical AI Literacy** – Teach not only how to use GenAI tools, but how they work, where they fail, and why ethical scrutiny is essential.
3. **Ethical and Creative Engagement** – Embed bias awareness and responsible use while encouraging GenAI-supported creativity and agency.
4. **Educator Enablement** – Build institutional capacity and equip educators with pedagogical tools, frameworks, and training.
5. **Systemic Equity and Collaboration** – Align educational practices with EU digital and youth strategies through cross-sector partnerships.



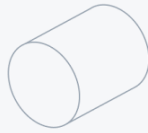
The proposed GenAI Integration Framework includes curriculum design principles, competency mapping, educational scenarios, and practical tools for learners and educators. It positions youth not just as users of AI, but as informed, ethical, and creative agents in shaping their digital futures.

1. Introduction

1.1 Context: GenAI and the Future of Learning

The rise of Generative Artificial Intelligence (GenAI) marks a transformative juncture in the evolution of digital technologies, with profound implications for educational theory and practice. GenAI tools - capable of producing human-like text, images, audio, and code - are redefining the nature of knowledge production, communication, and creative expression. Their growing ubiquity across sectors signals a shift toward more interactive and co-creative human-machine relationships, necessitating an urgent pedagogical response. For Generation Z (GenZ), the first generation to grow up entirely within a digitally networked environment, the presence of GenAI is increasingly normalized. Yet, their familiarity with the technology does not necessarily equate to critical understanding or informed use.

Within this landscape, formal education systems have yet to adequately address the multifaceted role of GenAI in shaping epistemologies, ethical considerations, and future skill demands. While informal and extracurricular exposure to AI tools is expanding, structured learning pathways remain fragmented, unevenly distributed, and often devoid of theoretical grounding or ethical inquiry. Without a coherent framework that guides young learners through the capabilities, limitations, and socio-political implications of GenAI, there is a risk of reproducing digital inequalities and failing to equip youth with the competencies required for meaningful engagement in an AI-mediated world. The current report is situated precisely within this gap, aiming to articulate a forward-looking educational strategy that acknowledges the urgency of AI



literacy while being attuned to the cognitive, social, and aspirational characteristics of GenZ learners.

1.2 Project Overview and Workstream Architecture

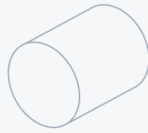
This strategic report represents the culmination of a multi-phase initiative designed to critically examine and reimagine the integration of GenAI in youth education. Structured across four sequential and interrelated activities, the project adopted an iterative and evidence-driven methodology to assess existing pedagogical approaches, consult key stakeholders, and co-develop strategic responses. Activities A1 through A3 served as the empirical backbone of the process, each contributing a distinct but complementary layer of insight.

Activity A1 engaged in a comprehensive mapping of current GenAI education tools, curricula, and training practices. This desk-based research integrated academic literature, field documentation, and exemplary case studies to identify prevailing pedagogical trends and discern structural gaps. Activity A2 advanced the inquiry through a stakeholder survey, collecting data from educators, youth, technology developers, and policy actors. This phase sought to surface the aspirations, perceived challenges, and experiential gaps faced by those directly involved in or affected by AI education. Activity A3 complemented the preceding analyses by convening focused group discussions that enabled the triangulation of data and the deepening of interpretive insights through dialogic engagement. These collective findings constitute the evidentiary foundation for the present report, Activity A4, which consolidates, synthesizes, and extends the prior learnings into a strategic framework.

1.3 Objectives of the Strategic Report (A4)

The primary objective of this report is to translate the multifaceted findings from Activities A1 to A3 into an integrated pedagogical strategy for the





implementation of GenAI education, particularly as it relates to the needs and realities of GenZ learners. In doing so, the report aims not merely to summarize prior research, but to engage analytically with identifying structural patterns, pedagogical tensions, and strategic opportunities that may inform the next generation of AI educational design.

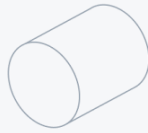
Specifically, the report seeks to identify key pedagogical principles that can underpin GenAI curricula, define critical competencies and learning outcomes, and offer actionable guidance for educational stakeholders. At a broader level, it endeavors to reframe GenAI not solely as a technological tool to be taught, but as a socio-technical phenomenon to be critically interrogated. This approach positions learners not only as passive recipients of knowledge, but as active agents capable of shaping and challenging the future of AI through informed, ethical, and creative engagement.

1.4 Alignment with European Digital and Youth Strategies

The development of this strategic report is closely aligned with major policy priorities of the European Union concerning youth empowerment, digital transformation, and ethical technology integration. The European Commission's Digital Education Action Plan (2021–2027) underscores the need to enhance digital literacy and foster high-performing digital education ecosystems. Similarly, the European Youth Strategy (2019–2027) highlights innovation, inclusion, and access to quality education as central pillars for enabling youth to thrive in an increasingly complex world.

Furthermore, the project responds to the EU's commitment to trustworthy and human-centric AI, as articulated in the European Strategy for Artificial Intelligence and related ethical guidelines. By addressing GenAI through an educational lens, this report supports the cultivation of an informed and





critically aware generation capable of navigating AI not just as consumers, but as citizens, creators, and decision-makers. The strategy proposed herein aims to bridge the policy-practice divide by offering a grounded yet visionary framework that can inform national curricula, institutional programming, and grassroots educational initiatives across the European context.

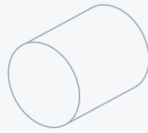
2. Methodological Framework

2.1 Overview of the Evidence Consolidation Process

The mapping exercise conducted under Activity A1 reveals a rapidly evolving but uneven GenAI educational landscape. A growing number of tools - ranging from text and image generators to low-code environments - are increasingly embedded in learning environments, either formally through institutional adoption or informally via self-directed exploration. However, the integration of these tools is often opportunistic rather than strategic, driven by technological novelty rather than pedagogical coherence.

A recurrent trend across reviewed materials is a strong emphasis on tool functionality over conceptual grounding. Many educational resources foreground “how-to” guides or software demonstrations while underrepresenting critical literacies such as data ethics, AI bias, and algorithmic transparency. Furthermore, while certain initiatives show promise in scaffolding creative and interdisciplinary learning, they remain highly localized or pilot-based, with limited transferability across educational systems. The analysis also highlights a marked disparity between resource-rich and resource-constrained contexts, with under-resourced schools facing infrastructural and capacity-related barriers that restrict meaningful engagement with GenAI.

Finally, despite increased rhetoric around “future skills,” there is no consensus around the competencies GenAI education should prioritize. This lack of curricular standardization risks exacerbating inconsistency in AI literacy across



Europe and underscores the urgent need for structured, inclusive, and forward-facing pedagogical models.

2.2 Sources of Input: Activities A1, A2, and A3

The primary evidentiary basis for this report derives from three interconnected activities, each contributing a distinctive lens and methodological approach. Activity A1 involved an extensive literature review and landscape mapping of existing GenAI educational tools, training resources, curricular models, and related pedagogical interventions. This activity provided a macro-level view of the current state of GenAI education, highlighting both innovation and fragmentation within the field.

Activity A2 complemented this desk research with empirical data drawn from a structured survey disseminated among key stakeholders, including educators, students, institutional leaders, policy experts, and AI practitioners. The survey captured qualitative and quantitative data regarding perceptions, expectations, and challenges related to GenAI learning. It offered direct insight into how current methodologies align—or fail to align—with the needs and aspirations of Generation Z.

Activity A3 further enriched the evidence base by conducting a series of focused group discussions designed to validate, deepen, and challenge the insights gained in A1 and A2. These facilitated dialogues engaged participants from diverse educational, technological, and policy backgrounds, enabling the team to surface lived experiences, critical reflections, and context-specific concerns.

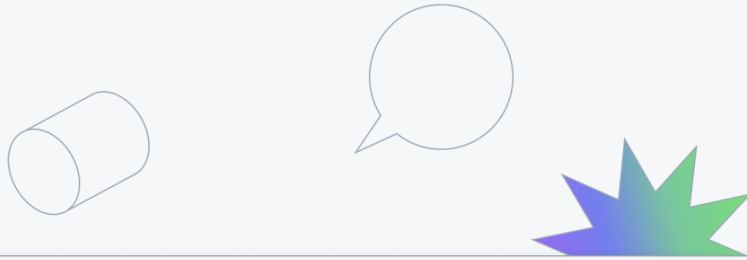


3. Consolidated Findings from Activities A1–A3

3.1 Educational Landscape: Tools, Trends, and Gaps (from A1)

The educational landscape is undergoing a rapid transformation due to the integration of Generative Artificial Intelligence (GenAI) tools, which are redefining how students learn and educators teach. A comprehensive review of the GenAI ecosystem reveals a diverse range of tools actively used across educational settings. These tools serve various functions, from content generation and personalized instruction to workflow automation and creative media production. Text-based tools such as ChatGPT have become mainstream among learners, with studies showing that nearly 89% of students use it for homework and academic writing, and close to half for completing quizzes or exams. ChatGPT is not only assisting students in knowledge acquisition but is also transforming how they approach assignments and critical thinking tasks.

Beyond text generation, visual content creation tools like DALL-E, Leonardo.Ai, and Bing Image Creator have enabled both students and educators to produce illustrations, educational diagrams, and multimedia presentations through simple textual prompts. These tools enhance visual literacy and are particularly useful in disciplines that benefit from spatial or conceptual visualization, such as science, geography, or design. In parallel, platforms like Magic School, Diffit, and QuestionWell are streamlining the educational workflow for teachers by automating lesson planning, generating differentiated learning materials, and creating adaptive quizzes aligned with curricular standards. Tools like Quizard and Diffit offer on-demand tutoring and reading-level adjustments, respectively, promoting inclusive learning practices and supporting students with diverse needs and abilities.



Several emerging trends are shaping the GenAI educational landscape. One key trend is the rise of scalable personalization. Adaptive learning platforms can now generate real-time educational content tailored to individual student profiles, improving engagement and academic outcomes. Another is the convergence of education and creativity - tools like Suno for music generation or D-ID for avatar-based communication allow students to engage with content in imaginative and multimodal ways. Student-led content creation is also gaining prominence, as learners use GenAI tools not just to consume but to produce meaningful academic and creative work, from essays to visual art and interactive presentations. AI-enhanced assessment is another notable trend, with platforms like QuestionWell supporting real-time feedback, vocabulary scaffolding, and cross-platform quiz generation. These shifts align well with the learning styles and digital fluency of Generation Z, who are the most prolific adopters of these tools. Research indicates that over 90% of Gen Z students use multiple AI tools on a weekly basis, further cementing the centrality of GenAI in contemporary education.

However, the review also highlights important gaps that must be addressed to ensure GenAI contributes positively and equitably to learning environments. One of the most pressing concerns is the risk of over-reliance on GenAI tools, which can inhibit the development of foundational cognitive skills such as analysis, synthesis, and original thought. The ease with which AI provides answers may discourage deep learning and critical engagement with content. Furthermore, disparities in access to premium AI features or devices capable of running advanced applications reinforce existing digital divides, limiting the benefits of GenAI for students from under-resourced backgrounds. Ethical challenges are also evident, especially around bias in AI-generated content, which can unintentionally perpetuate stereotypes or misrepresent certain groups. Personalized content that is not critically reviewed may lead to skewed perspectives or reduced cultural sensitivity.

Educators themselves face barriers in effectively adopting GenAI tools. Many teachers report feeling underprepared to integrate AI meaningfully into their instruction, citing a lack of professional training and institutional support. This is compounded by the absence of clear guidelines or curricular integration frameworks that would enable structured and pedagogically sound use of GenAI in classrooms. As a result, the use of these tools often remains informal, student-driven, and detached from formal learning objectives or assessment criteria. This limits the potential of GenAI to be embedded into systemic education reform.

In conclusion, GenAI tools are rapidly becoming a staple in modern education, driven by student adoption and their demonstrable benefits in productivity, personalization, and creativity. Yet, to fully realize their transformative potential, there must be intentional efforts to address gaps in equity, ethics, digital literacy, and educator capacity. This will require coordinated actions across policy, pedagogy, and practice to create an educational environment where GenAI enhances rather than undermines human-centered learning.

3.2 Youth Aspirations and Stakeholder Input (from A2)

The survey conducted across four European countries - Poland, Greece, Sweden, and Serbia - offers a valuable window into how young people perceive, use, and aspire to engage with Generative AI (GenAI) technologies. The data highlights strong technological engagement among youth, high familiarity with GenAI tools, and a cautiously optimistic attitude toward their educational and professional potential. Yet, it also underscores pressing concerns and structural barriers that must be addressed to harness GenAI's promise inclusively and responsibly.

Across all countries, youth reported exceptionally high rates of daily digital technology use. In Poland and Serbia, over 80% of respondents use technology "all the time," with similar trends observed in Greece and Sweden. This always-

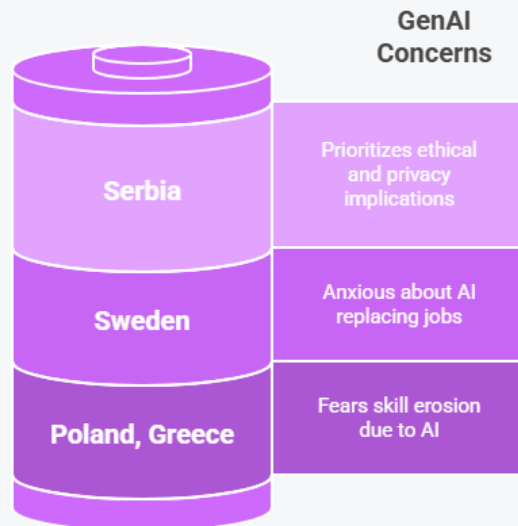
connected lifestyle is reflected in the types of digital services young people engage with—primarily social media, educational platforms, AI tools, and entertainment services. AI-based applications such as chatbots and image generators are becoming commonplace among youth, with notable adoption rates in Greece (79%) and Sweden (48%), and growing interest in Poland and Serbia. These digital habits create fertile ground for deeper GenAI integration, particularly in informal learning, self-directed education, and digital creativity.

Youth familiarity with GenAI tools is moderately high across the board. In Poland, 82% of respondents reported moderate to strong familiarity (Levels 3 to 5 out of 5), and similar results emerged in Sweden (71%) and Greece (89%). This indicates that while GenAI is not yet universally understood, a significant majority of young people are already engaging with these technologies in some form - especially through tools like ChatGPT, which enjoys near-universal recognition in all four countries. Visual tools such as DALL·E and Bing Image Creator also showed significant traction, particularly in Greece and Sweden. However, more specialized educational tools like Quizard and SlidesGPT were far less known, pointing to a gap between general and targeted educational applications.

Young people overwhelmingly recognize the benefits of GenAI. Across all countries, the most cited advantages were improved efficiency in completing tasks and content generation (text, images, music). In Greece, 84% of youth highlighted content creation as a key benefit, while 79% emphasized efficiency. These results suggest that GenAI is primarily viewed as a productivity amplifier and creative enabler. Personalized learning and education also emerged as important aspirations, especially in Greece and Poland, indicating a desire for adaptive educational environments that respond to individual learning styles and needs. Fewer respondents, however, associated GenAI with creativity or entertainment, signaling that these potentials are underexplored or undercommunicated in formal educational contexts.

Despite the enthusiasm, young people voiced strong concerns. Chief among these is the fear of over-reliance on AI and subsequent erosion of human skills - reported by 76% of respondents in Poland and 63% in Greece. This is followed by concerns about misinformation, privacy breaches, and ethical implications, all of which were shared widely across the sample. Youth in Sweden expressed the highest anxiety about job displacement (76%), while Serbian respondents prioritized ethical and privacy concerns. These findings reflect an awareness of the broader societal implications of GenAI, not just its personal utility. Importantly, very few respondents across all countries said they had "no concerns," suggesting that most young people are engaging critically with these technologies and seeking safeguards.

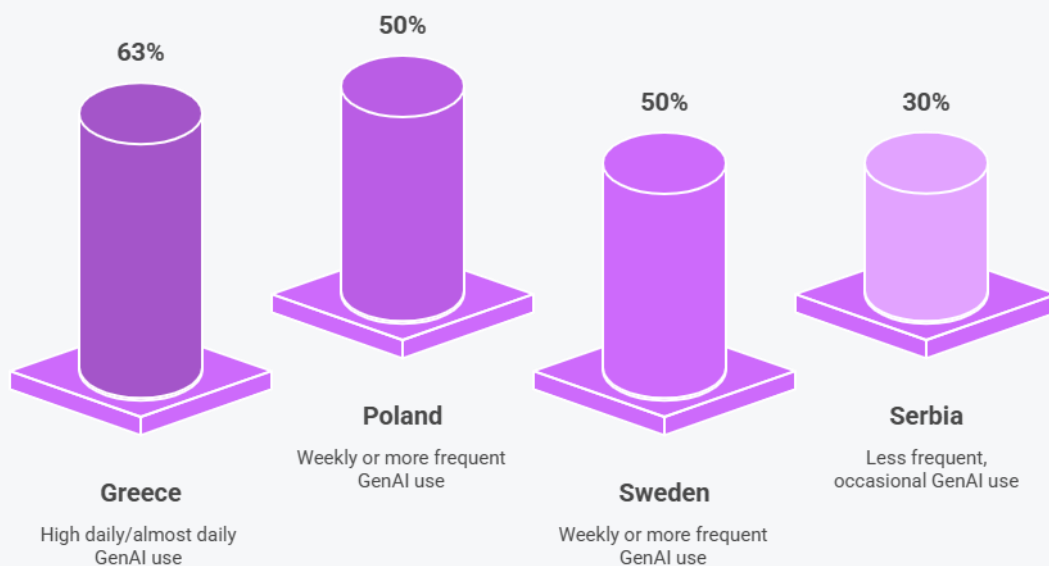
Youth concerns about GenAI range from personal to societal impact.



Made with Napkin

The frequency of GenAI use varies considerably. In Greece, 63% of youth use GenAI tools daily or almost daily, while in Poland and Sweden, about half do so weekly or more. Serbian youth were less frequent users, often citing only occasional engagement. GenAI tools are most commonly applied to professional and academic tasks, with significant use in work-related activities (notably in Greece and Poland), education (particularly in Sweden), and personal development (especially in Sweden and Greece). Usage in entertainment and social media remains marginal, despite the prevalence of AI-generated content in those domains. This suggests that while youth are open to integrating GenAI into serious or developmental pursuits, they may still lack awareness or access to more creative or recreational GenAI applications.

Frequency of GenAI Use Among Youth

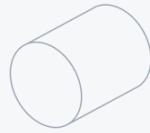


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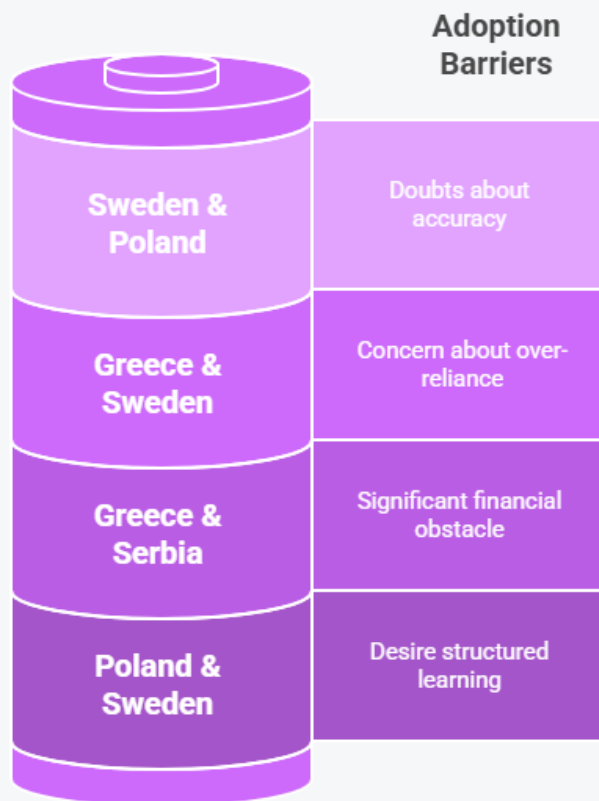
Barriers to adoption were diverse but revealing. Trust in AI outputs (accuracy and reliability) was a dominant concern across countries, especially in Sweden and



Poland. Fear of dependency was particularly acute in Sweden (52%) and Greece (42%), while cost and affordability emerged as significant in Greece and Serbia. Knowledge gaps - especially how to use GenAI tools effectively - were also noted, though to a lesser extent. Importantly, youth in Poland and Sweden expressed a desire for structured, credible learning opportunities, preferring online courses, workshops, and AI-integrated educational tools over more informal formats like social media or forums. This indicates a willingness to engage with GenAI critically and constructively if given the right tools and guidance.



Understanding barriers to GenAI adoption across different countries



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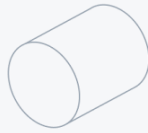
In conclusion, the aspirations of European youth regarding Generative AI are defined by a duality: they are digitally confident, highly engaged, and optimistic about GenAI's potential to empower learning, creativity, and productivity - but they are also discerning, ethically aware, and concerned about long-term dependencies and societal impacts. Their input suggests a clear demand for

educational pathways that not only teach technical competencies, but also cultivate critical thinking, digital responsibility, and inclusive access. For any GenAI strategy to succeed, it must center youth voices, address their nuanced concerns, and equip them with the tools to shape AI-driven futures on their own terms.

3.3 Multi-Stakeholder Dialogue and Priorities (from A3)

The third workstream (A3) facilitated national focus groups in Greece, Serbia, and Poland to engage youth, educators, technologists, and creative professionals in a dialogue on the current and future role of Generative AI (GenAI) in education, work, and society. Despite differences in national context, there was strong alignment across all three discussions on both the opportunities GenAI presents and the systemic risks that must be addressed to ensure its responsible integration.

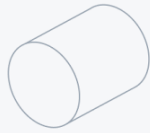
In all three countries, participants expressed appreciation for the productivity and creative support that GenAI tools offer. Tools such as ChatGPT, Canva, Gemini, Midjourney, and GitHub Copilot were widely used in everyday academic and professional contexts. In Greece, GenAI was used as a companion for exploring new academic subjects and improving workflows in design and software development. In Serbia, educators and technologists discussed using custom GPTs, image generators, and AI tools in both educational content creation and industrial applications. In Poland, participants highlighted the use of GenAI for game development, code generation, and academic writing. However, across all three settings, participants warned against over-reliance on AI, expressing concern that the simplification of complex tasks and information might erode deeper learning, critical thinking, and the ability to evaluate sources independently. This concern was especially pronounced in the Polish group, where AI was described as transforming learners from programmers of knowledge into mere assemblers of pre-packaged blocks.



One of the clearest shared priorities across the countries was the need for structured AI literacy that goes beyond basic usage. Participants emphasized that effective engagement with GenAI requires skills in prompt engineering, critical reflection, and ethical discernment. In Greece and Serbia, there was recognition of prompt engineering not only as a learning tool but as a viable career path, with job listings already appearing on professional platforms. Participants underscored that knowing how to ask meaningful questions, how to challenge or cross-check AI responses, and how to build knowledge from AI output are essential skills for navigating both education and the future of work.

Ethical considerations were a central theme in all three countries. Participants highlighted risks such as misinformation, hallucinated responses, and overconfidence in AI-generated outputs. In Poland, participants voiced strong concerns about AI's potential to replace high-skilled jobs, including programmers and graphic designers, as well as the risk of monopolization by major tech companies like Google, DeepMind, and OpenAI. There were also fears of censorship, with some participants noting that current AI platforms can restrict content related to sensitive political issues. Additionally, issues of data ownership and consent were raised, with specific reference to companies using user-generated content for model training without explicit approval, as in the case of Adobe. The Serbian and Greek participants echoed the call for increased transparency in how AI systems are developed and how outputs are generated.

Another key concern raised, particularly by educators in Serbia and Poland, was the challenge of maintaining academic integrity and meaningful assessment in the era of GenAI. The blurring line between original and AI-assisted student work has made it difficult to evaluate learning outcomes fairly. Participants urged educational institutions to rethink both pedagogy and assessment, moving towards models that reward creativity, critical engagement, and process over polished final outputs.

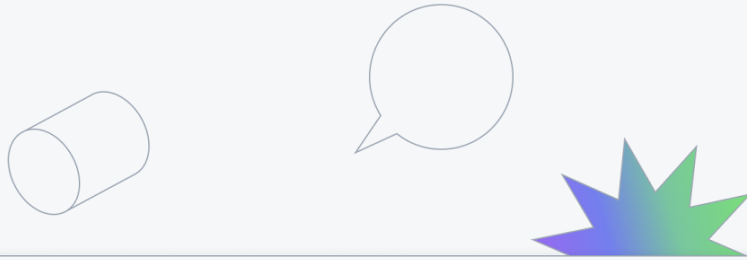


At a deeper level, participants across all three countries reflected on how GenAI is reshaping what counts as knowledge and expertise. In Greece, some participants emphasized the importance of redefining who is seen as a credible source in a world where AI increasingly delivers the “answers.” Young people called for educational models that prioritize questioning, dialogue, and critical exploration over static content delivery. In Serbia, the need for emotionally aware and context-sensitive AI was discussed, with suggestions that future systems should be capable of more human-like dialogue and clarification. Polish participants added that future AI development should focus on sustainability and social impact - highlighting use cases such as AI for climate resilience, healthcare access, and equitable development.

Finally, across the dialogue sessions, there was a consistent message from young stakeholders that GenAI should be a collaborative and empowering tool - one that enhances, not replaces, human creativity, empathy, and agency. Participants advocated for greater inclusion in how these tools are designed, open access to educational resources and platforms, and strong European-level governance that can ensure transparency, fairness, and alignment with democratic values.

3.4 Cross-Cutting Themes and Systemic Barriers

The cross-analysis of findings from focus groups, surveys, and contextual research reveals a range of persistent cross-cutting themes and systemic barriers that shape how Generation Z interacts with, adopts, and perceives Generative AI (GenAI) across Europe. These insights illuminate not only the technological dimensions but also the social, ethical, educational, and institutional landscapes within which GenAI is being introduced.



3.4.1. Digital Fluency vs. Critical Literacy

Generation Z demonstrates high digital fluency, with frequent and enthusiastic use of GenAI tools such as ChatGPT, DALL·E, Canva, and Midjourney. However, this fluency does not consistently translate into critical digital literacy. Focus group discussions revealed concerns about over-reliance on GenAI tools for even basic tasks, potentially leading to a decline in independent learning, critical thinking, and creativity. Survey data corroborates this with over 60% of participants citing "dependency on AI and skills loss" as a primary concern.

3.4.2. Misinformation and Trust in AI Outputs

Participants across both qualitative and quantitative data sources expressed growing concern about the reliability of GenAI outputs. Hallucinations (fabricated or misleading answers) were repeatedly mentioned as a key issue, especially in academic and professional contexts. There is a systemic lack of training on how to verify or contextualize GenAI-generated information. Furthermore, the conflation between traditional search engines and LLM-based tools signals a deeper need for educational differentiation and trust-building mechanisms.

3.4.3. Ethical Awareness and Transparency

A significant theme emerging from all data sources is the call for greater transparency and ethical alignment in GenAI design and deployment. Young users are increasingly aware of biases in LLMs, lack of source attribution, and ethical dilemmas surrounding AI in decision-making, healthcare, and education. Participants advocated for clearer communication on how GenAI systems are trained, how outputs are generated, and what limitations exist. Ethical literacy is lacking in formal curricula and institutional training programmes.

3.4.4. Equity of Access and Digital Divide

Despite GenZ's overall high connectivity, disparities remain across socio-economic and geographic lines. For example, survey findings highlighted that

while some participants used advanced and customized AI tools regularly, others had limited exposure due to lack of institutional infrastructure or personal access to devices and internet connectivity. This digital divide contributes to unequal opportunities for skill acquisition and GenAI-enabled learning, exacerbating educational inequities.

3.4.5. Lack of Institutional Guidance and Educator Preparedness

Educational systems across surveyed regions appear to be lagging in providing structured and coherent pathways for GenAI integration. Focus group participants and survey respondents alike identified a vacuum in institutional support—both in terms of curricular content and educator capacity. Many students reported relying on self-directed learning or peer networks to explore GenAI, while educators from older generations expressed concerns about pedagogical appropriateness and lacked confidence in facilitating AI-based learning

3.4.6. Fragmentation of Learning Pathways

Currently, the experience of learning about and with GenAI is fragmented and informal. While some students leverage AI for coding, research, and creativity, these activities often occur outside formal learning environments. There is an absence of coherent learning objectives or progression models that embed AI literacy across disciplines and educational levels. This contributes to inconsistent skill development and missed opportunities for transversal competence building

3.4.7. Need for Multi-Stakeholder Collaboration

Finally, systemic barriers include the lack of coordinated, multi-stakeholder engagement. While young people, educators, and professionals express clear needs and expectations, there is limited alignment between policy frameworks, educational providers, and industry actors. Focus group participants called for cross-sector collaboration to ensure that AI evolves in a way that is socially

responsible, educationally enriching, and future-proofed through thoughtful regulation and sustained dialogue

These cross-cutting themes point to a dual imperative: enhancing GenZ's readiness to engage critically and creatively with GenAI while simultaneously addressing the systemic gaps in institutional infrastructure, equity, policy, and ethical governance. Tackling these barriers requires a coordinated response across education, policy, industry, and civil society to develop inclusive, transparent, and empowering GenAI ecosystems across Europe.

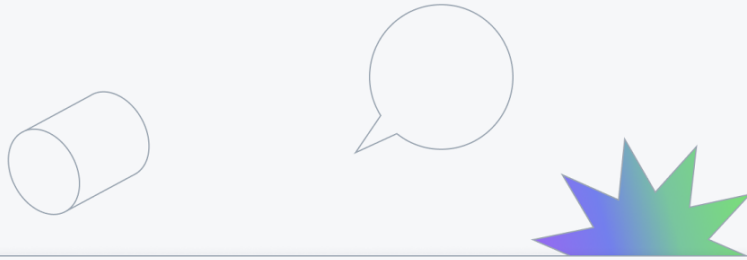
4. Strategic Priorities for GenAI Education

4.1 Youth-Centered Pedagogical Values

The successful integration of Generative AI (GenAI) into European education systems demands a pedagogical paradigm that is deeply responsive to the evolving identity, expectations, and needs of youth—particularly Generation Z. As digital natives, GenZ learners engage with technology intuitively; however, their interactions with GenAI reflect both enthusiasm and skepticism, efficiency and concern, fluency and fragility. Youth-centered pedagogical values must therefore not only support digital engagement but cultivate agency, critical judgment, and ethical orientation in a rapidly transforming epistemic landscape.

4.1.1. From Passive Consumption to Active Cognitive Engagement

A key analytical insight from focus group and survey data is the risk of cognitive deskilling due to passive dependence on GenAI outputs. Participants reported frequent use of tools like ChatGPT and Canva for task automation and content creation, yet also voiced concerns about “recycling of saturated information” and the loss of creative originality. This points to a pedagogical misalignment: while educational systems increasingly integrate AI tools as learning aids, they often fail to scaffold critical AI literacy - the ability to interrogate, critique, and refine machine-generated knowledge.



Pedagogical frameworks must thus shift from use orientation (how to use GenAI) to thinking orientation (how to think with GenAI). This involves embedding GenAI not as a solution, but as a dialogic tool that provokes inquiry, comparison, and skepticism. For example, asking students to compare AI-generated summaries with primary sources cultivates reflective cognition and awareness of epistemological limitations.

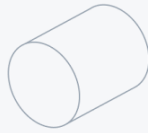
4.1.2. Agency in the Age of Algorithms

One paradox emerging from the research is that although GenZ learners are proficient tool users, their sense of agency in shaping or challenging AI narratives is limited. Survey data suggests that while many use GenAI frequently, few feel confident in customizing or questioning its outputs beyond surface-level interaction. This reinforces the need for pedagogical models that prioritize autonomy, enabling learners to direct their own inquiries, shape their use of GenAI through advanced prompting, and engage in iterative co-creation with AI systems.

Such values support a move away from rote or standardized learning toward exploratory learning environments, where learners not only receive answers but understand how those answers are constructed and how they might be contested.

4.1.3. Ethical Consciousness as a Learning Outcome

A striking pattern across both qualitative and quantitative inputs is the heightened ethical awareness among youth users. Participants voiced concerns around misinformation, hidden bias, and over-reliance on AI as a source of truth—especially in health and education contexts. This sensitivity reflects an emergent value system that perceives GenAI not merely as a tool but as a sociotechnical actor—a technology embedded with assumptions, exclusions, and power dynamics.



Youth-centered pedagogy must thus treat AI ethics as a central learning axis, not an auxiliary concern. This includes fostering inquiry into the provenance of training data, model transparency, and the social consequences of AI-generated outputs. By placing these questions at the heart of GenAI education, institutions can cultivate technological citizenship - the ability to engage with AI critically, ethically, and democratically.

4.1.4. The Social Dimension of GenAI Learning

Another analytical tension lies in the individualized design of GenAI tools versus the collective learning preferences of GenZ. While many GenAI platforms are optimized for solitary use, youth learning preferences—as evidenced in focus groups and prior research - lean toward collaborative, peer-based environments. This misalignment risks reinforcing isolation and diminishing opportunities for social learning, particularly in creative and problem-solving domains.

Pedagogical approaches should therefore reframe GenAI as a collaborative medium, integrated into team-based activities such as peer-review of AI outputs, co-prompting exercises, and AI-supported group projects. This encourages dialogic interaction not only between humans and machines but also among learners themselves.

4.1.5. Equity as a Foundational Value

Finally, a critical cross-cutting concern is equity of access, both technological and pedagogical. While GenZ exhibits high levels of digital engagement, survey data reveals disparities in access to GenAI tools, infrastructure, and institutional support—especially across socio-economic and national lines. A youth-centered pedagogical approach must therefore prioritize universal design, ensuring that AI literacy is not a privilege of the digitally affluent but a right for all learners.

This includes:

- Developing low-bandwidth, open-access AI learning environments;
- Providing multilingual and accessible materials;
- Equipping educators with inclusive teaching strategies;
- Embedding GenAI education across formal and non-formal learning contexts.

To serve youth meaningfully, GenAI pedagogy must evolve from technocentric implementation to value-driven transformation. This means designing learning experiences that do not merely teach tool usage, but that foster autonomy, criticality, ethics, and inclusion. These values are not peripheral—they are preconditions for ensuring that GenAI strengthens, rather than undermines, the democratic, creative, and humanistic purposes of education.

A youth-centered approach to GenAI is not only about adapting content—it is about redefining what it means to learn, to know, and to be empowered in an AI-saturated world.

4.2 Digital Inclusion and AI Literacy

Digital inclusion is foundational to any GenAI education strategy, yet the country reports underscore significant asymmetries in both access to technology and foundational AI literacy. While young people in countries such as Poland and Greece report high levels of daily technology use - with over 90% of Polish respondents using digital devices “frequently” or “all the time” - this ubiquitous engagement does not equate to informed or critical usage of AI technologies. In Sweden, where AI tools are reportedly integrated more in educational contexts, familiarity remains uneven, and many young people rely on informal sources such as social media or peers rather than structured learning environments. This discrepancy points to a broader literacy gap: while GenZ knows how to use GenAI tools, they often lack deeper understanding of what these tools do, how they function, and why their outputs should be scrutinized.

Effective AI literacy must go beyond basic tool familiarity to encompass understanding of algorithmic logic, model limitations, and responsible

prompting. This involves not only teaching technical fluency but also enabling learners to critically engage with how AI shapes knowledge, authority, and social interaction. Country-level responses, especially from Serbia, reveal limited institutional engagement in AI education, further emphasizing the need for publicly funded, cross-sectoral digital inclusion initiatives. Without such efforts, educational systems risk deepening an emerging AI divide - not just between those who can access AI tools, but between those who can understand and leverage them meaningfully.

4.3 Embedding Ethics, Bias Awareness, and Creativity

A recurring concern across all country reports is the absence of structured opportunities to interrogate the ethical implications of GenAI. Participants from Greece and Sweden, for instance, emphasized risks related to misinformation, bias, and ethical misuse of AI-generated content, with 63% of Greek respondents and 42.9% of Swedish participants specifically citing these concerns. At the same time, focus group discussions revealed that young users do not passively accept GenAI outputs - they are highly attuned to the risks of over-reliance, hallucinations, and the erosion of original thinking. This ethical awareness, however, is largely reactive and unstructured, reflecting a significant gap in formal education systems.

To address this, ethics and bias awareness must be systematically embedded across GenAI curricula - not as a standalone topic, but as a transversal competency in all subject areas. Ethical inquiry should become a habit of engagement: learners must be trained to ask who designs AI tools, whose perspectives are encoded, and what social or political interests are at stake. Importantly, ethics must not be divorced from creativity. Across all countries, young people expressed a desire for GenAI to augment - not replace - their creative processes. For example, Greek and Swedish students reported using GenAI for ideation and exploration but voiced frustration when outputs felt generic or unoriginal. Creativity, then, should be framed as a core learning outcome of GenAI education, reinforced by project-based activities that ask

students to remix, critique, and transform AI outputs with their own voice and context.

4.4 Educator Enablement and Institutional Capacity

A core barrier to meaningful GenAI integration is the underpreparedness of educators and institutions. Reports from Serbia and Greece suggest that while students are experimenting with GenAI tools, educators often lack the training, confidence, or support to scaffold these experiences pedagogically. The institutional response to GenAI is often fragmented, reactive, or absent altogether. As a result, students rely heavily on peer networks or self-teaching - an approach that, while reflective of GenZ's digital culture, may reproduce unequal learning outcomes and deepen knowledge gaps.

There is a critical need to build institutional capacity through structured professional development, co-designed AI literacy frameworks, and investment in interdisciplinary curricula that empower teachers to use GenAI purposefully. This includes training on the use of AI as a pedagogical co-agent (e.g., for feedback, personalization, or content adaptation), but equally, it requires equipping educators with the language and tools to critically frame AI within wider societal and ethical debates. The country findings suggest that without cross-generational alignment, the potential of GenAI will remain underutilized or inconsistently implemented. Empowering educators must become a strategic priority, not only to improve learning outcomes but to foster trust, coherence, and equity across European education systems.

4.5 Addressing Equity and Access Challenges

Finally, GenAI education cannot succeed unless it directly addresses the structural inequities that limit access to digital infrastructure, relevant skills, and meaningful participation. Although the Polish and Greek reports suggest high overall engagement with digital tools, significant access disparities persist, particularly in lower-income or rural areas. The Serbian findings further emphasize that while GenAI usage is growing, systemic limitations - such as

underfunded institutions and lack of educator training - create substantial barriers for inclusive adoption.

Equity must be understood in both technological and pedagogical terms. On the one hand, this requires infrastructural investments in devices, connectivity, and safe learning environments. On the other hand, it demands inclusive learning design - content and tools must be adapted to local languages, cultural contexts, and varying levels of digital fluency. Special attention must also be paid to intersectional inequities: for instance, gendered patterns in AI adoption (noted in Polish and Swedish data), or the underrepresentation of minority groups in AI-related education. Without systemic policy alignment and targeted equity strategies, GenAI risks becoming a new layer of exclusion in already unequal educational systems.

As Europe advances its digital education agenda, addressing these challenges is not merely a question of access - it is a matter of justice, innovation, and resilience. Educational inclusion in the GenAI era must be proactive, not reactive, and co-developed with the youth who will inherit its consequences.

5. The GenAI Integration Framework

The successful integration of Generative AI (GenAI) in education requires a structured, future-oriented, and inclusive framework. This framework must align with learners' diverse needs, national educational strategies, and broader EU goals on digital transformation, inclusion, and innovation. Based on evidence from the survey, focus groups, and stakeholder inputs, the following section outlines key pedagogical and operational components to guide the implementation of GenAI in formal and non-formal education settings across Europe.

5.1 Curriculum Design Principles

Curriculum development for GenAI education must be guided by principles that are learner-centric, interdisciplinary, adaptable, and ethically anchored. First and foremost, flexibility is essential. As GenAI tools and their applications evolve rapidly, the curriculum should not be overly prescriptive but allow for continual iteration and localization. This is particularly critical in contexts like Serbia and Poland, where infrastructure or policy support may lag behind learner usage trends.

Secondly, the curriculum must be transdisciplinary, bridging computer science, ethics, media literacy, creativity, and social studies. GenAI is not only a technical tool but a cultural and epistemological disruptor. Embedding it across disciplines allows learners to understand its systemic implications and apply it meaningfully in diverse fields - from journalism to biology to art.

Third, co-creation must become a principle of curriculum design. Learners should not be passive recipients but active participants in shaping how GenAI is taught and contextualized. This approach, strongly echoed in focus groups with youth, enhances relevance and ownership.

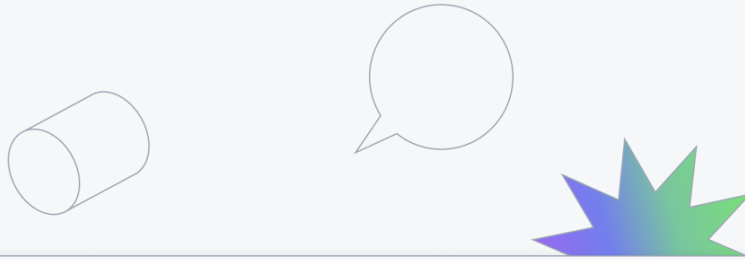
Finally, ethical reflexivity must be hardwired into the curriculum - ensuring students not only use AI but interrogate its development, application, and social consequences.

5.2 Learning Objectives and Competency Mapping

The introduction of GenAI in education must be underpinned by clearly articulated learning objectives that map to both digital and transversal competencies. Based on cross-country analysis, three core domains emerge:

5.2.1 AI Literacy and Technical Fluency

Learners should be able to use GenAI tools effectively (e.g., prompt engineering, input refinement), understand basic AI mechanics (e.g., data training, language



models), and identify limitations (e.g., hallucinations, biases). This competency addresses the uneven familiarity observed across countries like Greece, Sweden, and Poland, where young people often use tools daily but lack structured understanding.

5.2.2 Critical and Ethical Thinking

Students should develop the ability to evaluate GenAI outputs, question source validity, recognize ethical risks (e.g., surveillance, misinformation), and formulate responsible usage norms. This is particularly relevant given the widespread concern among youth about misinformation and dependency.

5.2.3 Creative and Strategic Application

Learners should apply GenAI to solve real-world problems, support their creative process, or generate new insights across disciplines. This involves blending AI with design thinking, problem-solving, and storytelling.

Competency progression should be scaffolded across educational levels, and aligned with EU frameworks such as DigComp and AI4K12, allowing for integration into national standards while supporting pan-European mobility and recognition.

5.3 Suggested Educational Pathways and Scenarios

Integrating GenAI should not follow a one-size-fits-all model. Instead, adaptive educational pathways should be developed to reflect different learner profiles, educational levels, and institutional contexts. Three core pathways are proposed:

5.3.1 Exploratory Pathways (Lower Secondary / Informal Settings)

These introduce GenAI as a topic of curiosity and play, focusing on visual tools (e.g., DALL·E, Canva), AI games, and ethical storytelling. This is especially important for younger learners or those from under-resourced contexts (noted in

Serbia and rural Poland) where motivation and access need to be carefully scaffolded.

5.3.2 Applied Pathways (Upper Secondary / VET / Lifelong Learning)

These integrate GenAI into projects, portfolios, and vocational simulations. For example, AI-supported career exploration, resume generation, or coding assistance using tools like GitHub Copilot. This is especially relevant in Greece, where youth expressed interest in GenAI as a tool for career development.

5.3.3 Critical Inquiry Pathways (Higher Education / Youth Dialogues)

These scenarios emphasize research, debate, and interdisciplinary projects focused on AI ethics, governance, and innovation. Ideal for advanced learners and aligned with EU-level youth initiatives and digital policy consultation.

Each pathway should be designed with flexible entry points, enabling learners to transition across them as they gain experience, confidence, and curiosity.

6. Tools and Educational Assets

6.1 Overview of Developed Materials

The strategic deployment of GenAI in education necessitates the development of versatile, context-sensitive, and user-centered educational tools. These tools are not only technological artifacts but also pedagogical enablers - bridging the gap between learner curiosity, educator capacity, and institutional strategy. The following section outlines the key categories of materials and resources created to support GenAI integration across diverse learning environments, drawing on stakeholder input and best practices from participating countries.

The project will produce a core suite of educational materials designed to address varying levels of AI familiarity, technological access, and pedagogical needs. These include:

- Introductory Toolkits for learners and educators, offering step-by-step guides to popular GenAI platforms such as ChatGPT, DALL·E, Bing Image Creator, and custom GPTs. These kits focus on ethical use, prompt crafting, and task-specific functionality (e.g., text rewriting, summarizing, coding).
- Modular Learning Units aligned with the curriculum design principles outlined in Section 5.1. These modules are adaptable for both formal and informal education and include materials on AI history, model training logic, and applied AI in art, writing, STEM, and civic education.
- Visual Aids and Interactive Media, such as infographics, annotated examples, and explanatory videos. These are especially relevant for younger or lower-literacy learners, helping to demystify complex AI systems through engaging and accessible formats. This aligns with survey insights from countries like Poland and Greece, where high digital fluency does not always translate into conceptual understanding.

The development process prioritized co-creation with youth and iterative testing with educators, ensuring that the assets are both relevant and adaptable to real-world classroom and extracurricular contexts.

6.2 Guidelines for Educators and Facilitators

Recognizing the pivotal role of educators—and their current underpreparedness as reflected in the Serbian and Greek reports—a comprehensive set of practical guidelines has been developed. These aim to build both technical confidence and pedagogical fluency in facilitating GenAI-enabled learning.

Key components to include:

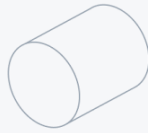
- Principles for Ethical Facilitation, helping educators understand data privacy, consent in tool usage, bias mitigation, and transparent AI integration. Given the recurring concerns around ethical AI use (noted across all countries), this was a top priority.
- Lesson Planning Templates and scaffolding strategies for differentiating instruction using GenAI (e.g., how to support diverse learners in creating, analyzing, or critiquing AI outputs).
- Case-Based Teaching Scenarios offering ready-to-use classroom situations, from AI-augmented peer editing in language learning to AI-assisted historical simulations.

The guidelines also emphasize facilitative over directive roles, encouraging educators to position themselves as co-learners alongside students, particularly in exploratory or project-based modules. Feedback loops, peer mentoring, and reflective journals are suggested as tools for building collective competence within learning communities.

7. Conclusion

This report has consolidated empirical evidence and cross-sectoral insights to articulate a coherent and forward-looking strategy for the integration of Generative Artificial Intelligence (GenAI) in youth education across Europe. Drawing upon the findings of Activities A1 to A3 - comprising landscape analysis, stakeholder surveys, and multi-stakeholder focus groups - it becomes evident that while GenAI tools are increasingly embedded in the digital practices of young people, formal educational systems remain inadequately equipped to respond to this technological transformation in a structured, equitable, and ethically grounded manner.

The widespread and growing use of GenAI among Generation Z signifies both an opportunity and a challenge. On the one hand, these technologies offer new modalities for creativity, personalization, and knowledge production. On the



other hand, their integration into educational settings is often fragmented, informal, and lacking in critical literacy components. Furthermore, disparities in access to infrastructure, institutional capacity, and educator preparedness contribute to an emerging stratification in AI literacy - raising concerns about digital equity and educational justice.

To address these dynamics, the report advances a youth-centered pedagogical framework grounded in five strategic pillars: digital inclusion, critical AI literacy, ethical and creative engagement, educator enablement, and systemic equity. The proposed GenAI Integration Framework complements this by offering actionable pathways for curriculum design, competency development, educational tools, and assessment strategies. Collectively, these recommendations seek to reposition GenAI not merely as a technical tool to be adopted, but as a socio-technical phenomenon that must be critically interrogated, contextually adapted, and pedagogically scaffolded.

Ultimately, the findings reinforce the need for a paradigm shift: from ad hoc implementation to strategic integration; from tool-centric training to value-driven education; and from passive exposure to active, critical, and collaborative engagement. Achieving this vision will require sustained investment, intersectoral collaboration, and the inclusion of youth as co-creators of their educational futures.

In an era increasingly shaped by artificial intelligence, the imperative is clear: to ensure that GenAI serves as a catalyst for inclusive, reflective, and transformative learning - anchored in the democratic values and humanistic purposes that define the educational project in Europe.