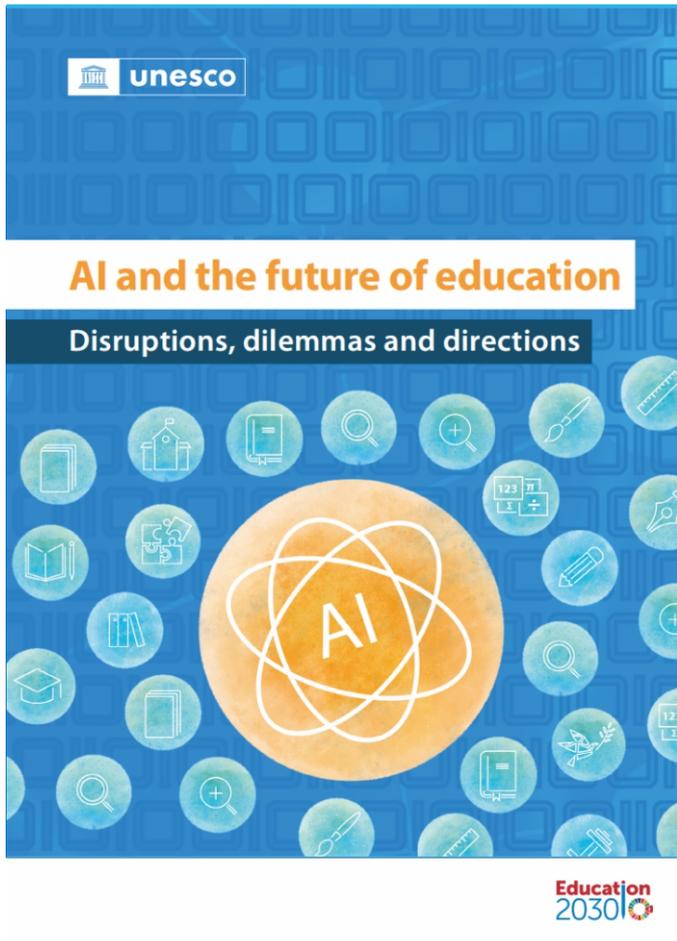# Digital Education Bulletin

Global Insights

世界数字教育联盟
WORLD DIGITAL EDUCATION
ALLIANCE

CONTENTS

UNESCO

AI and the Future of Education: Disruptions, Dilemmas and Directions

In 2025, the United Nations Educational, Scientific and Cultural Organization (UNESCO) released the report *AI and the Future of Education: Disruptions, Dilemmas and Directions*, an anthology that explores the philosophical, ethical and pedagogical dilemmas posed by the disruptive influence of artificial intelligence (AI) in education. Bringing together insights from global thinkers, leaders and changemakers, the collection challenges assumptions, surfaces frictions, provokes contestation, and sparks audacious new visions for equitable human–machine co-creation.

Covering themes from dismantling outdated assessment systems to cultivating an ethics of care, the 21 think pieces in this volume take a step towards building a global commons for dialogue - a shared space to think together, debate across differences, and reimagine inclusive education in the age of AI.

1. Introduction: Reclaiming Education's Public Purpose through Dialogue

The introductory chapter situates AI in education within a set of unfolding and often contradictory conversations spanning disciplines, regions, and worldviews. UNESCO reiterates that education is not merely a vehicle for skills development or economic advancement, but a fundamentally relational, ethical, and civic endeavour grounded in human dignity, inclusion, and social justice. Against dominant narratives that privilege speed, scale, and efficiency—frequently driven by powerful commercial interests—the volume argues for the need to reclaim education as a public good. To this end, it proposes the creation of a dialogic commons: a shared global space in which diverse, including marginalized, perspectives can engage meaningfully in shaping AI-enabled educational futures.

2. AI Futures in Education: Philosophical Provocations

The first substantive section opens with philosophical provocations that move beyond instrumental understandings of AI. The contributions challenge foundational assumptions about intelligence, learning, and human agency, drawing on relational, post-humanist, and non-Western philosophical traditions. Rather than approaching AI solely as a tool to be governed or optimized, the essays explore its ontological and epistemological implications for education. Learning is reframed as distributed, relational, and more-than-human, while uncertainty and disorientation are treated not as problems to be eliminated, but as productive conditions for ethical imagination and rethinking educational futures.

3. Debating the Powers and Perils of AI in Education

This section deliberately stages competing perspectives, reflecting deep disagreements over the role AI should play in education. Some contributions adopt a pragmatic orientation, emphasizing strategic leadership, selective adoption of AI technologies, and the importance of developing AI literacy for both teachers and learners. Others offer sustained critiques of prevailing narratives surrounding generative AI and artificial general intelligence, warning that such narratives obscure technological limitations while consolidating power in the hands of a small number of commercial actors. Read together, these essays reveal AI in education as a profoundly political issue, one that demands democratic scrutiny, public accountability, and resistance to technological determinism.

4. AI Pedagogies, Assessment, and Emerging Educational Futures

Focusing on teaching, learning, and assessment, this section examines how AI unsettles long-standing pedagogical assumptions. Contributors critically interrogate hyper-personalized learning, algorithmic decision-making, and automated assessment systems, noting their potential to narrow learner agency, marginalize teachers' professional judgement, and reproduce existing inequalities. At the same time, alternative pedagogical futures are explored. These include formative, relational, and human-centred assessment practices in which AI functions as a mediating presence rather than a substitute for human interpretation. Assessment emerges as a particularly revealing site where the limitations and inequities of current education systems are laid bare.

5. Revaluing and Recentering Human Teachers

Responding to widespread anxieties about teacher displacement, this section recentres the role of human educators in AI-augmented learning environments. Drawing on educational philosophy and developmental theory, the contributors emphasize that teaching cannot be reduced to content delivery, efficiency, or instructional automation. Teachers are instead positioned as ethical agents and intentional designers of learning, responsible for shaping how AI is integrated into pedagogical practice. The section advances practical and normative arguments for embedding care, well-being, and professional agency into both AI design and educational decision-making, underscoring the irreplaceable relational dimensions of teaching.

6. Ethical and Governance Imperatives for AI Futures in Education

As AI becomes embedded within educational infrastructures, governance emerges as a central concern. This section addresses issues of data governance, algorithmic bias, transparency, and accountability, emphasizing that educational technologies are never neutral. Contributors argue for an ethics of care by design, calling for participatory and inclusive governance frameworks that embed human rights and dignity from the outset. The concept of synthetic governance is introduced to capture emerging forms of hybrid human–machine decision-making, raising critical questions about democratic participation, power, and educational sovereignty in increasingly data-driven policy environments.

7. Confronting Coded Inequalities in Education

This section foregrounds equity and inclusion by examining how AI systems can encode and reproduce social, cultural, and linguistic inequalities. Through context-sensitive analyses, the contributions focus on marginalized learners, including those in the Global South, young women, and learners who are deaf or hard of hearing. Rather than viewing inclusion as a technical problem to be solved through optimization, the authors argue that equity requires co-design with communities, sensitivity to local contexts, and sustained attention to lived experience. AI is thus reframed as a socio-technical system whose educational impacts are shaped by history, power relations, and institutional choices.

8. Reimagining AI in Education Policy: Evidence and Geopolitical Realities

Turning to education policy, this section situates AI within broader geopolitical and economic dynamics. Contributors examine how AI increasingly functions as an instrument of statecraft, shaped by strategic investment in infrastructure, data, and knowledge systems. At the same time, the section questions narrow conceptions of evidence-based policy-making, proposing instead that policy be understood as a process of collective learning and experimentation. Education policy is reframed as iterative and participatory, oriented toward human capability development and social purpose rather than technological optimization alone.

9. Conclusion: Towards a Global Commons for Dialogue and Action

The chapter reiterates that the future of AI in education cannot be determined by technology in isolation. UNESCO calls for sustained global dialogue, ethical imagination, and collective responsibility to ensure that AI supports human flourishing and the public mission of education. Rather than offering definitive solutions, the volume leaves many questions deliberately open-ended, emphasizing that AI-enabled educational futures are still in the making. Through dialogue, critical reflection, and shared action, the report invites educators, researchers, and policymakers to co-create inclusive, ethical, and human-centred futures for education in an age of AI.
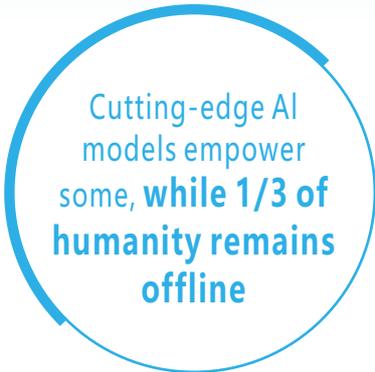
Cutting-edge AI models empower some, **while 1/3 of humanity remains offline**

Full report available at:

https://www.unesco.org/en/articles/ai-and-future-education-disruptions-dilemmas-and-directions?hub=83250

Reference:

UNESCO. (2025, September 2). AI and the future of education: Disruptions, dilemmas and directions. https://www.unesco.org/en/articles/ai-and-future-education-disruptions-dilemmas-and-directions?hub=83250
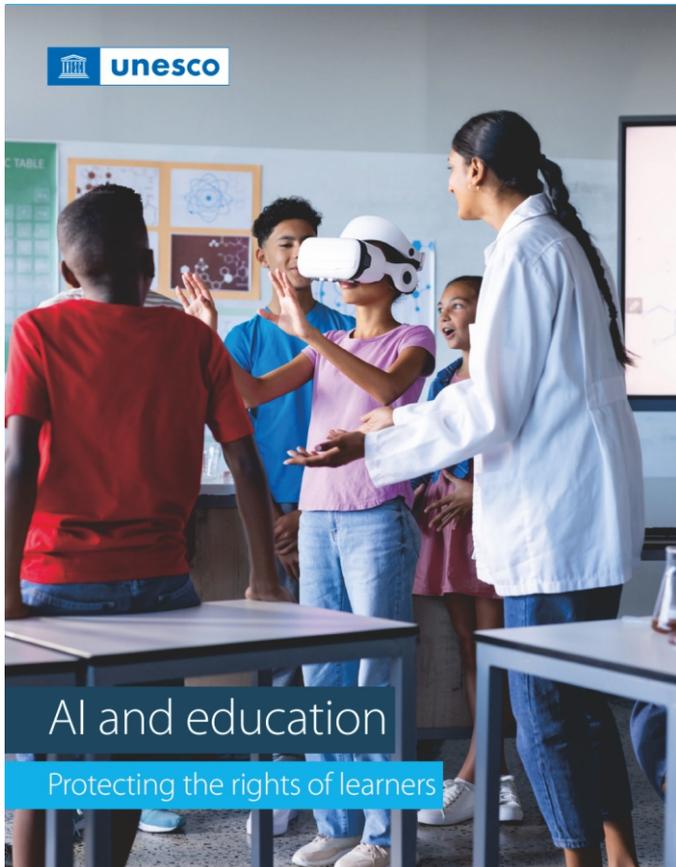
AI and Education: Protecting the Rights of Learners

Published in 2025, UNESCO released AI and Education: Protecting the Rights of Learners as a key policy-oriented report in the context of accelerating global digital transformation and the expanding use of artificial intelligence (AI) in education. This report emphasizes that all efforts must prioritize a human-centred and rights-based use of digital technology to benefit all learners. It calls for urgent national and international action to ensure that technology enhances, rather than endangers, the right to education for all. The report is organized into two main sections. It also develops an analytical tool called the "5C framework", which provides governments and stakeholders with a common reference point to guide digital education reforms.

AI in education must be anchored in the right to education and safeguarded by human rights

Part I: The right to education

1. Digitalization and the Right to Access Education

UNESCO recognizes education as a fundamental human right and as a foundation for peace and sustainable development. The Global Education 2030 Agenda (Sustainable Development Goal 4) aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." However, as of 2024, nearly one third of the world's population—around 2.6 billion people—still lacks Internet access. This deepens the digital divide and risks giving rise to an "artificial intelligence divide". Vulnerable groups, including girls and women, rural populations, persons with disabilities and marginalized communities, are particularly affected.

2. Digitalization and Quality Education

Digital technologies have enabled innovative pedagogical methods and more personalized learning experiences, such as game-based learning, simulations and AI-driven tutoring systems. However, overreliance on AI chatbots can lead to what the report terms "AI-chatbot-induced cognitive atrophy", potentially undermining learners' critical thinking, memory and problem-solving abilities.

Modern education systems must therefore integrate both functional digital literacy and critical digital literacy into curricula: not only teaching learners how to use digital tools, but also enabling them to critically understand how technologies work, whose interests they serve and what risks they entail.

Teachers are at the centre of digital transformation in education. The adoption of digital tools by teachers and learners alike can be hindered by psychological barriers such as fear, misconceptions and scepticism. Overcoming these barriers requires sustained support, collaborative professional development and a shift in pedagogical beliefs, ensuring that technology is used to enhance, rather than replace, human relationships and the social dimensions of education.

3. Digital Divides and Inequalities

The digital divide reinforces and often amplifies pre-existing inequalities in education, particularly affecting rural populations, low-income households, persons with disabilities, women and girls, older learners and marginalized communities. The report highlights several overlapping dimensions of this divide:

Socioeconomic divide	Geographic divide
Gender divide	Disability divide
Generational divide	

4. The Role and Risks of Non-State actors in Digital Education

While non-State actors can bring innovation, expertise and resources, in the absence of effective public regulation they may also undermine equity, compromise privacy and exacerbate stratification in education. Strong public governance is therefore essential to harness their contributions while safeguarding the right to education.

5. Governance Challenges in Digital Education

The central message of this chapter is that governance of digital education must ensure that technology strengthens, rather than undermines, the right to education. This requires clearly defined responsibilities, broad stakeholder participation, and continuous oversight and evaluation.

In many countries, digital education is not led by ministries of education, but by other government bodies such as ICT or telecommunications ministries. According to the report, only about 48 per cent of countries have ministries of education in the lead on education technology governance. Elsewhere, responsibilities are shared among multiple ministries or located outside the education sector, which increases the risk of fragmented decision-making and policies that are poorly aligned with teaching and learning priorities. Effective digital education governance should include the meaningful participation of teachers, learners, parents and civil society organizations.

Part II: Human Rights Implications of Digitalization of Education

Privacy risks

Only 20% of ed-tech products comply with minimum privacy standards, and AI training datasets often use students' personal information without authorization, including facial recognition data and emotion analysis. In response to these risks, the State of New York has issued a temporary ban on the use of facial recognition technologies in schools.

Protection from violence

According to the 2024 report on child sexual exploitation material, AI-generated content has surged by 1,325%. Women and gender-diverse groups are disproportionately impacted by online violence; 58% of women report having experienced online harassment.

Right to work and skills adaptation

Digital skills have become essential for employment, yet 30% of the global workforce lacks basic digital skills. In sub-Saharan Africa, 57% of workers have no digital skills at all. AI is projected to automate up to 27% of routine instructional tasks, but only seven countries have introduced national frameworks for building teachers' AI competencies.

Cultural and linguistic diversity

AI training data remains heavily dominated by Western content, with English accounting for more than 50% of all online material. Over 3,000 languages are almost unrepresented in digital education ecosystems. Indigenous languages—such as Māori and Native American languages—face heightened risk of disappearance due to the lack of AI support and digital tools for preservation and learning.

Protecting Learner and Teacher Agency in AI-Driven Education

Human rights risks in AI-enabled education are escalating. Weak privacy protections, the rapid growth of AI-generated online violence, widening digital skills gaps, and the dominance of Western and English-language data are jointly undermining learners' safety, the right to work, and cultural and linguistic diversity, particularly for women, marginalized groups, and Indigenous communities.

Conclusion: The 5C Framework

To ensure that digitalization enhances rather than undermines the right to education, States must embed human rights considerations into digital learning environments and act across each dimension of the 5C framework:

- **Coordination and leadership:** Establish cross-sectoral governance frameworks that align digital education policies with international human rights obligations. Strengthen mechanisms for accountability, transparency and public participation, and ensure that education remains a public good.

- **Content and solutions:** Ensure that AI systems and digital education solutions comply with legal principles of non-discrimination and respect for cultural and linguistic diversity and cultural rights. Regulatory frameworks should require transparency in AI-generated educational content and guard against algorithmic bias. National curricula should explicitly integrate critical digital literacy and the ethical, responsible use of technology.

- **Capacity and culture:** Legal frameworks must protect teachers' professional autonomy and academic freedom in digital learning environments, ensuring that AI supports rather than replaces human educators. Teachers should be equipped with key digital competences, and education systems should foster a digital culture that promotes inclusive pedagogy and full participation for all learners.

- **Connectivity and infrastructure:** Guarantee universal, affordable and rights-based digital access, with particular attention to rural, under-resourced and marginalized communities. National legislation should explicitly recognize access to digital education as part of the right to education.

- **Cost and sustainability:** Public policies should secure sustainable funding for teachers, school infrastructure, connectivity and digital tools, ensuring that investments prioritize groups historically excluded from quality education and that digital transformation is financially and environmentally sustainable.

In a rapidly digitalizing world, the right to education cannot be left to market forces or technological trends alone. States must fulfil their human rights obligations by ensuring that digital education is inclusive, equitable and free from undue commercial influence. Legal safeguards must be proactive, preventing algorithmic bias, data exploitation and erosion of educational autonomy from becoming entrenched.

Through stronger governance, legal accountability and enhanced cooperation at both national and international levels, the digital transformation of education can become a powerful means of realizing the right to education, rather than a source of exclusion and privatization. As AI and other emerging technologies continue to evolve, policymakers, educators and international actors share a clear responsibility: to uphold education as a fundamental human right and to ensure that no learner is left behind in the digital age.

Full report available at:

https://unesdoc.unesco.org/ark:/48223/pf0000395373

Reference:

UNESCO. (2025, September 4). *AI and education: Protecting the rights of learners*. https://www.unesco.org/en/articles/ai-and-education-protecting-rights-learners?hub=83250

OECD

Education Policy Reform Dialogues 2025 in Luxembourg

The 8th session of the Organisation for Economic Co-operation and Development (OECD) Education Policy Reform Dialogues (EPRD) was held at the European Convention Center in Luxembourg. From 28 to 29 November 2025, EPRD 2025 brought together delegations from the ministries of education of 27 countries, along with senior-level education policymakers from various international organisations.

The Education Policy Reform Dialogues constitute one of the highest-level permanent policy mechanisms within the OECD's education governance framework. Since their launch in 2018, the Dialogues have been held annually on a rotating basis among OECD member and partner countries. The event convenes ministers, vice-ministers, state secretaries and director-general-level officials to discuss priority issues in education reform and to promote international exchange on policy innovation and practical experience—including shaping more equitable societies through education and training, redesigning education systems, and strengthening the development of future-ready skills.

This year's EPRD was co-hosted by OECD and the Ministry of National Education, Children and Youth of Luxembourg, and focused on "Nurturing Engaged and Resilient Lifelong Learners in a World of Digital Transformation", an official theme aligned with the OECD's Education Policy Outlook 2025.

Prior to the formal sessions, on 27 November, participating delegations conducted institutional visits to several lifelong learning organisations in Luxembourg, including the National Institute for Teacher Training (IFEN), the Digital Learning Hub, and the Centre National de Formation Professionnelle Continue (CNFPC). These institutions showcased Luxembourg's policies and practices in teacher professional development, micro-credential systems, youth technical education, vocational upskilling, and multi-stakeholder support for lifelong learning. The visits provided delegates with concrete examples of Luxembourg's lifelong learning ecosystem and offered practical insights that informed subsequent policy discussions.

For more details, please visit the link below:

https://gouvernement.lu/fr/actualites/toutes_actualites/communiques/2025/11-novembre/28-meisch-oecd.html?utm_source=chatgpt.com

OECD

Education Policy Outlook 2025: Nurturing Engaged and Resilient Lifelong Learners in a World of Digital Transformation.

Education Policy Outlook 2025

Nurturing Engaged and Resilient Lifelong Learners in a World of Digital Transformation

On 28 November 2025, the Organisation for Economic Co-operation and Development (OECD) released the report *Education Policy Outlook 2025: Nurturing Engaged and Resilient Lifelong Learners in a World of Digital Transformation*. The report examines how countries and economies can strengthen individuals' agency as lifelong learners and support people in actively identifying, acquiring, and applying new knowledge and skills across diverse contexts. It defines lifelong learners as individuals who are able to mobilise their will, skills, and means to continue learning and adapt to change.

This report analyses how countries can support lifelong learning across four critical life moments: early childhood, early to mid-adolescence, mid-career and late career. These are stages when individuals are especially open to learning or at risk of disengagement. Drawing on over 230 policies from 35 countries and economies, the report identifies strategic choices of policy design, as well as how these support the will, skills and means of learners. The analysis of policies and their results has led to the identification of key policy priorities.

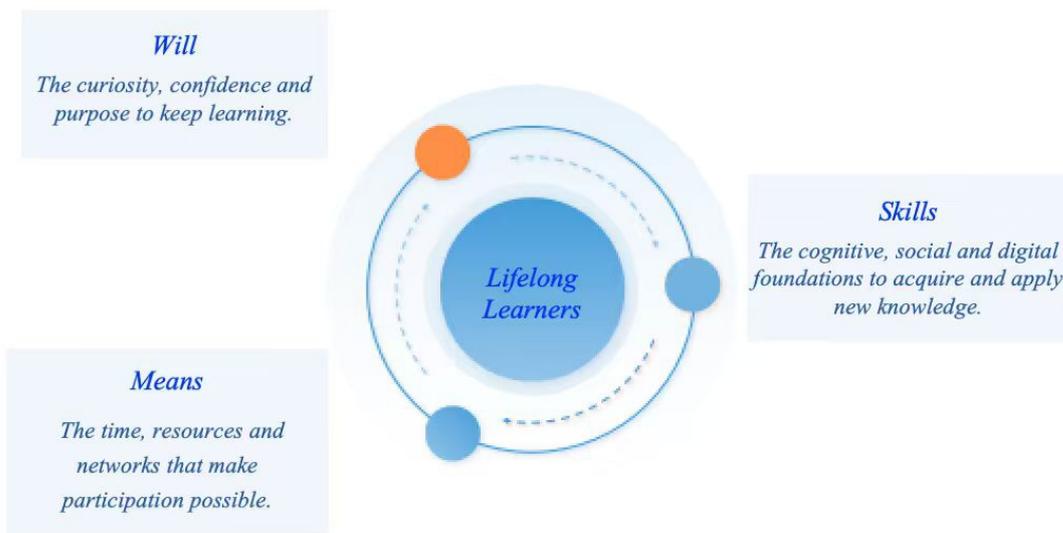| *Early Childhood Career*	*Early to Mid-Adolescence*	*Mid-Career*	*Approaching Retirement*
01	**02**	**03**	**04**
Laying the foundation for lifelong learning by fostering curiosity and self-confidence.	Developing a clearer sense of self-awareness and personal values, and shaping individual identity.	Facing multiple pressures and demonstrating a need to upskill or reskill for career advancement or transition	Confronting risks of social disengagement and skills obsolescence, while preparing for the transition to retirement.

Will — The curiosity, confidence and purpose to keep learning.

Skills — The cognitive, social and digital foundations to acquire and apply new knowledge.

Means — The time, resources and networks that make participation possible.

Lifelong Learners

Early childhood (ages 0 to 6): Building curiosity and confidence

Early childhood lays the foundation for lifelong learning. During these formative years, children develop the dispositions that underpin all later learning, such as curiosity, persistence and motivation. Families and educators shape these early experiences, while policies provide coherent frameworks and support access to quality provision. Policies address these elements as follows:

Will — Nurture dispositions and skills for lifelong learning

Skills — Foster early cognitive and socio-emotional development; enhance quality for all; harness digital tools and delivery.

Means — Strengthen the home learning environment; ensure equitable access; support cross-sectoral collaboration.

Policy priorities include supporting the workforce, so they have dedicated time, support and professional learning opportunities to shape environments that foster curiosity, creativity and socio-emotional growth. Family engagement can also be strengthened through structured outreach, guidance and partnerships. Countries can continue expanding access as well, such as in Czechia and Spain for children aged 0-3 and vulnerable groups.

Infographic 2.1. How policy strategies for early childhood vary according to their aims

Most common approaches identified according to policy aim (selected categories)

What policies seek to achieve		How policies deliver on aims		Who makes it happen	What instruments are produced
	POLICY AIMS	**MECHANISM**	**SUPPORTING ACTIONS**	**ACTORS INVOLVED**	**RESOURCES GENERATED**
Will	Dispositions for lifelong learning	Standards, curricula, workforce development (CPD, coaching)	Cross-sector frameworks; mental-health and well-being modules; joint training	Health and nutrition staff; social workers; mental-health consultants; ECSET	Holistic curriculum frameworks; guidelines
Skills	Cognitive and socio-emotional development	Curricula, professional development, family engagement	Curriculum dissemination, provision of digital guidance, pedagogical planning	Educators, specialist roles in team-based structures, families, local municipalities	Pedagogical documentation, individual learning plans, structured reflection protocols
Skills	Quality provision for all	Regulation, standards and curricula; CPD and coaching	Quality codes; standards; national referential	Teaching staff; mentors, coaches; trainers; curriculum assessment experts; ministries & QA advisors/inspectors	Quality & inspection standards; training manuals
Skills	Harnessing digital tools and delivery	Digital platforms and embedded digital curricula	Open libraries; learning management systems; templates; exemplars	Governmental agencies; digital pedagogy coaches; ICT specialists; ed-tech & data/analytics support	Digital platforms & resource banks
Means	Equitable access	Outreach, targeted fundings and access supports (subsidies, entitlements)	Eligibility checker; application portals; provider guidance	Ministries and agencies; municipalities; fiscal authorities; ECEC providers	Admissions & navigation portals
Means	Home learning environment	Standards and curricula (family engagement guidance)	Home-learning kits; activity templates; storybooks; guidance materials	Families; ECEC educators; ministries & local authorities; community facilitators	Family-facing kits & materials
Means	Cross-sectoral collaboration	Interministerial frameworks, collaboration structures	Inter-institutional committee; diagnostic/forecasting frameworks; service protocols	Municipal managers, inter-agency coordinators; inspectors/evaluators	Infrastructure, community centers, coordination procedures

Note: See Annex 2.A for a more complete view on the policies included in this chapter.
Source: Education Policy Outlook (2025): National Questionnaire for Comparative Policy Analysis: Nurturing Engaged and Resilient Lifelong Learners in a World of Digital Transformation.

Early to mid-adolescence (ages 10 to 16): Shaping identity and purpose.

Adolescence is when learners start defining who they are and what they value. They need perseverance, self-reflection and the capacity to make informed choices. Yet this stage also carries high risk of disengagement from school. Environments that make learning relevant, relational and purposeful, with effective teacher practices and quality teacher–student relationships, can sustain adolescents' motivation and self-belief, with lasting effects on lifelong learning. Policies address these elements as follows:

Will   Nurture student agency; support social and emotional skills.

Skills   Ensure effective teaching practices; develop transversal competencies.

Means   Harness digitalisation; strengthen career readiness and guidance; support cross-sectoral collaboration.

Policy priorities include investing in continuous, practice-based professional learning. This approach enables teachers to connect new curricula, digital tools and formative assessment in ways that foster students' motivation and agency. For example, Finland is modernising curricula and assessment and Iceland promotes cross-sector collaboration to integrate education, social and health services.

Infographic 3.1. How policy strategies for early to mid-adolescents vary according to their aims

Most common approaches identified according to policy aim (selected categories)

What policies seek to achieve	How policies deliver on aims		Who makes it happen	What instruments are produced
POLICY AIMS	**MECHANISM**	**SUPPORTING ACTIONS**	**ACTORS INVOLVED**	**RESOURCES GENERATED**
Will — Student agency	Curricula renewal, career planning, learner-owned portfolios	Activities for structured reflection, goal-setting, planning; career planning	Teachers, school leaders, families	Curricula frameworks, guidance
Will — Socio-emotional development	Guidelines, counselling services, school-based teams, curriculum integration	Creating supportive environments, counselling services, school-based teams providing support	Ministries, professional staff, counsellors, psychologists, health agencies, NGOs	Outreach resources, program guidelines, counselling
Skills — Teacher effectiveness	Teacher professional development, competence centres, resources	Professional learning for teachers to translate goals and content into pedagogy	Ministries, universities, professional learning providers, trainers, mentors, teachers	Guidelines, frameworks, online resources for teaching
Skills — Transversal competencies	Curricula renewal, fostering critical thinking, collaboration, creativity	Updating materials for teaching, digital resources, new assessment tools	Ministries, curriculum and evaluation institutes, universities, teachers, school leaders	Curricula frameworks, guides, repositories
Means — Harnessing digitalisation	Digital platforms, AI tools, governance frameworks, skills assessments	Professional development, new feedback loops, monitoring implementation	Ministries, EdTech firms, universities, private sector	Learning management systems, digital platforms
Means — Career readiness and guidance systems	Career guidance systems, VET reforms, digital portfolios, online platforms	Employer co-design, connecting students with role models, job shadowing	Teachers, mentors, workplaces, employers	Guidance, mentoring, career files, job materials
Means — Cross-sectoral collaboration	Legislation and funding linking education, health and social services	Cross-sectoral programs and collaborative activities	Ministries, local authorities, communities, social protection, health and labour systems	Digital resources, data portals, quality assurance tools

Note: See Annex 3.A for a more complete view on the policies included in this chapter.
Source: Education Policy Outlook (2025): National Questionnaire for Comparative Policy Analysis: Nurturing Engaged and Resilient Lifelong Learners in a World of Digital Transformation.

Mid-career (ages 35 to 44): Supporting flexibility and mobility.

At mid-career, adults face competing demands, such as from work and family, while needing to upskill or reskill. They are more likely to engage in learning when opportunities align with their lives and when their effort leads to tangible outcomes, such as recognition or career advancement. To empower mid-career adults, policymakers should consider financial support, structural flexibility, and strong engagement mechanisms that remove barriers. Policies address these elements as follows:

Will — Strengthen motivation and agency through learner entitlements; guidance and peer or community networks that rebuild confidence.

Skills — Offer modular and stackable qualifications; support employability and portability; and build digital and transversal skills to participate effectively in technology-enabled learning.

Means — Support access and participation through predictable funding, guidance and digital tools; and strengthen cross-sector partnerships to share costs, align training with labour-market needs and extend reach to Small and Medium Enterprises (SMEs) and non-standard workers.

Policy priorities include creating short, adaptable learning opportunities that fit around personal and professional responsibilities. Policies should also strengthen recognition and quality assurance so that learning – whether digital, modular or workplace-based – leads learners to portable, valued qualifications that support career mobility and resilience. For example, Estonia has developed a system that formally recognises skills acquired outside formal education, including through work, volunteering and informal learning. Similarly, Norway provides employer-based training in foundational and workplace skills backed by government grants. Such approaches can be particularly relevant in labour markets marked by frequent job transitions and career changes.

Infographic 4.1. How policy strategies for mid-career adults vary according to their aims

Most common approaches identified according to policy aim (selected categories)

	What policies seek to achieve	How policies deliver on aims		Who makes it happen	What instruments are produced
	POLICY AIMS	MECHANISM	SUPPORTING ACTIONS	ACTORS INVOLVED	RESOURCES GENERATED
Will	Learner entitlements	Individual learning accounts; self-employed inclusion; learner choice	Learning accounts & entitlements; self-employed routes; guidance	Ministries; PES; guidance providers	Learning accounts, entitlements; self-employed inclusion routes; guidance manuals
Will	Inclusion and equity	Targeted financial incentives; outreach; regional delivery	Targeted vouchers, scholarships; guidance and outreach for vulnerable groups; regional hubs	NGOs; PES; regional and local governments	Targeted outreach campaigns; awareness kits and manuals
Skills	Qualification pathways and stackability	RPL; QA frameworks; micro-credentials	RPL & recognition centres; micro-credential pilots; accreditation and QA of providers	Ministries; QA agencies; RPL centres; universities	Recognition guidelines; modular curricula; micro-credential pilots
Skills	Employability and portability	RPL and credit transfer; sectoral partnerships; modularisation	RPL centers & credit transfer pilots; modular courses, micro-units; sectoral partnerships	Employer organisations; sector councils; education providers	Diagnostic tools, RPL centres, credit-transfer frameworks; updated curricula and manuals
Skills	Digital skills	Digital platforms; sectoral digital upskilling; equity measures	National platforms and portals; sectoral and firm-based digital training; equity measures & outreach	Digital agencies and ministries; employer associations	Online platforms, blended learning catalogues; sectoral digital upskilling tools
Means	Access and participation	Financial incentives; guidance; digital platforms	Vouchers, subsidies; one-stop services, PES guidance; targeted outreach; national portals	Ministries; PES; NGOs and community organisations	Outreach campaigns, manuals, awareness kits; national portals, catalogues
Means	Cross-sector partnerships	Sectoral/tripartite councils; job-based learning; employer co-financing	Sectoral councils & levy funds; work-based learning & apprenticeships; employer co-financing/subsidies	Tripartite councils; employer–union funds	Sectoral councils, manuals; employer-driven training tools

Note: See Annex 4.A for a more complete view on the policies included in this chapter.
Source: Education Policy Outlook (2025): National Questionnaire for Comparative Policy Analysis: Nurturing Engaged and Resilient Lifelong Learners in a World of Digital Transformation.

Approaching retirement (ages 55 to 65): Adapting, contributing and staying connected.

As adults approach retirement, lifelong learning takes on new significance as adults prepare for transitions within work and into retirement. Faced with greater risks of disengagement, skill depreciation and labour-market exclusion, older adults benefit from learning opportunities that strengthen adaptability, rebuild purpose and confidence, and enable them to apply their experience and skills in new and meaningful ways. Beyond acquiring new skills, learning in later life helps individuals sustain a sense of fulfilment, social participation and contribution to their communities. Policies address these elements as follows:

| Will | Encourage continued engagement and recognise the value of experience. |

| Skills | Promote upskilling and reskilling, digital inclusion and inter-generational learning. |

| Means | Expand access through age-friendly workplaces, tailored incentives and coordinated health, labour and education services. |

Policy priorities include empowering older adults by recognising their experience and fostering engagement in learning throughout life. Community-based learning initiatives can enable older adults to manage their own learning, share their knowledge and strengthen social cohesion. Workplaces play a key role by valuing experience and embedding age-inclusive practices, such as mentoring, flexible work arrangements and inter-generational knowledge transfer within organisational culture. These can be supported by incentives and thoughtful human-resource design.

Infographic 5.1. How policy strategies for late-career adults vary according to their aims

Most common approaches identified according to policy aim (selected categories)

What policies seek to achieve		How policies deliver on aims		Who makes it happen	What instruments are produced
POLICY AIMS		**MECHANISM**	**SUPPORTING ACTIONS**	**ACTORS INVOLVED**	**RESOURCES GENERATED**
Will	Late-career learner motivation	Counselling; mentoring; self-paced community & HE learning	Short, modular courses; guided reflection and peer learning; outreach	Ministries; PES; guidance services; HE and community providers	Learning guides; mentoring networks; community courses; digital resources
	Employer-led motivation for learning	Financial incentives; pledges; advisory support	HR redesign; mentoring; awareness campaigns; public commitments	Employers; ministries; PES; social partners	Incentive schemes; HR toolkits; outreach materials; monitoring frameworks
Skills	Upskilling and retention	Modular and work-based training; subsidies; RPL and micro-credentials	Short courses; on-the-job learning; sectoral pathways; reimbursement schemes	Ministries; PES; VET providers, social partners, employers' organisations	Action plans; voucher schemes; training catalogues; self-assessment tools; monitoring templates
	Digital inclusion and adaptability	Digital skills modules; community and workplace learning	National platforms/portals; R&D; blended and senior-friendly training; outreach via libraries and NGOs	Governmental agencies; local authorities; NGOs; businesses & civil society	Digital platforms; toolkits; guides; digital outreach materials
Means	Access and participation	HE provision; targeted funding; access support; modularisation	Short, stackable courses; free/subsidized offers; paid training leave; local learning hubs & HE institutions	Ministries; PES; VET/HE providers; community centres	Voucher schemes; outreach tools; modular course catalogues; digital learning packages; resource databases; guidelines
	Equity and age-friendly workplaces	HR reforms; public pledges; mentoring; flexibility; financial incentives	Age-inclusive strategies; awareness campaigns; guidance/outreach for vulnerable groups	Employers; unions; ministries of labour; social partners	HR toolkits; mentoring guides; inclusion frameworks; digital platforms for knowledge sharing

Note: See Annex 5.A for a more complete view on the policies included in this chapter.
Source: Education Policy Outlook (2025): National Questionnaire for Comparative Policy Analysis: Nurturing Engaged and Resilient Lifelong Learners in a World of Digital Transformation.

Creating a culture of lifelong learning means cultivating both the habits and institutions that make learning expected and valued. Countries need to combine clear standards with individual agency and collaborative delivery, showing that lifelong learning flourishes when motivation, capability and opportunity reinforce one another.

For more details, please visit the link below:

https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/11/education-policy-outlook-2025_667cde89/c3f402ba-en.pdf
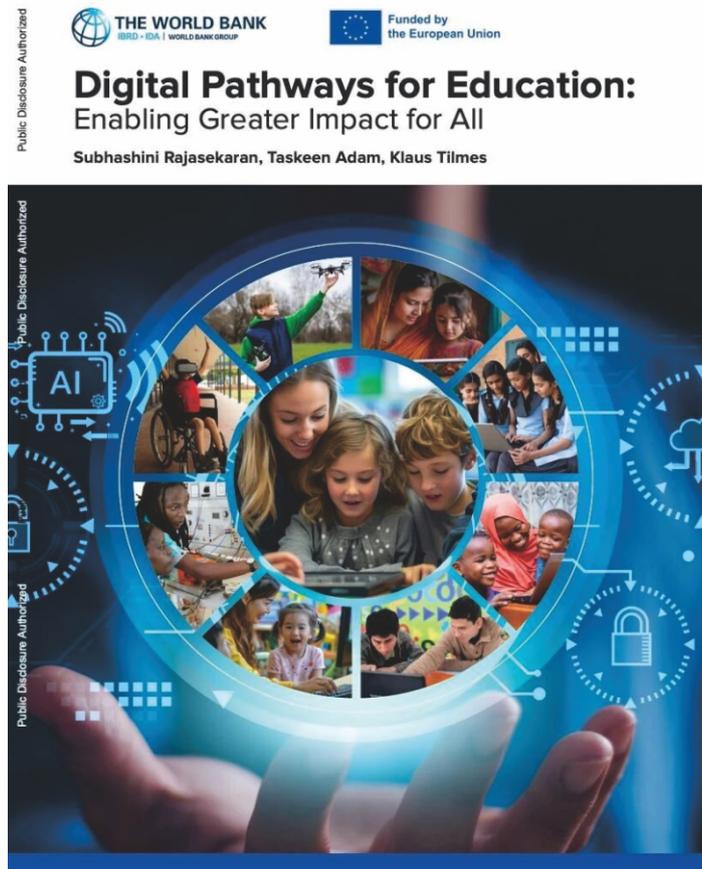
Reference:

OECD (2025), Education Policy Outlook 2025: Nurturing Engaged and Resilient Lifelong Learners in a World of Digital Transformation, OECD Publishing, Paris, https://doi.org/10.1787/c3f402ba-en.
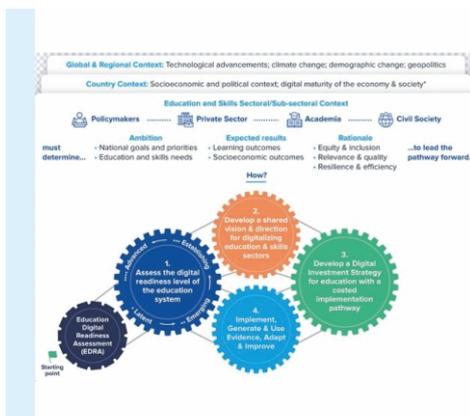
World Bank

Digital Pathways for Education: Enabling Greater Impact for All

The world is facing a longstanding global learning and skills crisis. Over half of 10-year-olds in low- and middle-income countries cannot read and understand an age-appropriate text, and 87 percent of them are in Sub-Saharan Africa. In 2024, 251 million children and young people were out of school, and as of 2023, 468 million lived in a conflict zone (UNESCO UIS). Two thirds of school age children (approx. 1.3 billion globally) do not have access to the internet at home. Skills mismatches are increasingly evident in a highly dynamic labour market.

Concurrently, digital technologies are permeating education at unprecedented speed and scale. The possibilities of using digital solutions to enhance teaching and learning, and to revolutionise educational processes are attractive. At the same time, the related systemic investment needs are substantial, evidence of effectiveness is scarce, and risks abound. Policymakers face formidable, multi-faceted opportunities and challenges in designing and implementing digitally enabled education services at scale.

THE WORLD BANK
IBRD · IDA | WORLD BANK GROUP

Funded by the European Union

Digital Pathways for Education:
Enabling Greater Impact for All

Subhashini Rajasekaran, Taskeen Adam, Klaus Tilmes

What can policymakers do to leverage digital solutions for better learning outcomes?

- Keep a steady focus on the vision of providing equitable, relevant, and resilient learning for all.

- Recognise that each country's unique contextual conditions and vision for its economy and society will drive its digital pathways for education and skills development.

- Play a strategic and hands-on role in shaping evidence-based policies that drive the integration of digital technologies in education.

- Recognize and support the role of teachers as cultivators, coaches and critical pedagogues to help students build the 21st century skills required to survive and thrive in the digital era

- Tailor digital pathways – deliberately consider and fine-tune strategies and policies which address the diverse and dynamic needs within each specific country context.

- Proactively tackle the inherent trade-offs when taking decisions on digital investments.

How can countries make a digital transition in education?

Policymakers, the private sector, civil society, and academia can use the following architecture as a framework to think through their country's digital transition in education and define their unique trajectory.

Overall, digital pathways in education and skills development can be seen as the interplay of two dimensions:
(1) **depth of digital transitions,** the extent to which public policy efforts take a systemic approach in the strategic governance, infrastructure, policy design, and government-level implementation and (2) **scale of digital transitions**, the extent to which digital transitions are supported by strong and learning-centred private markets, research and innovation ecosystems.
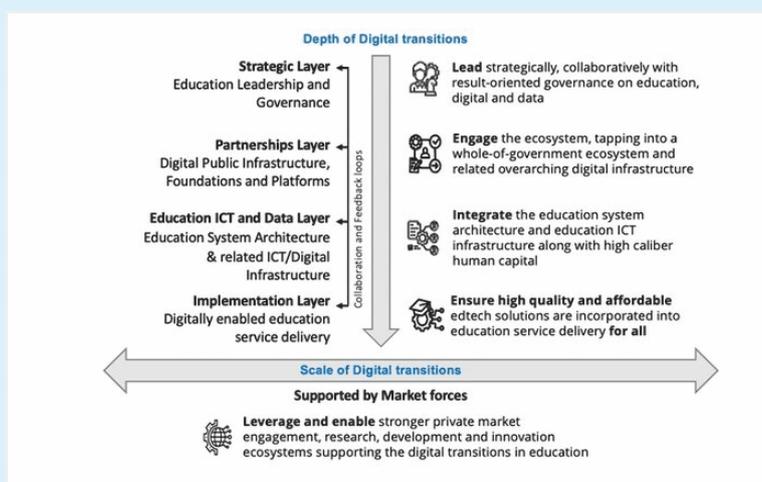
The report offers a profound analysis of the vital role of digital transformation in the education sector and provides valuable insights and guidance for policymakers, educators, and the wider community.

For more details, please visit the link below:

https://www.worldbank.org/en/topic/edutech/publication/digital-pathways-education-enabling-learning-impact?utm_source=chatgpt.com

Reference:

World Bank (2025), Digital Pathways for Education: Enabling Greater Impact for All, World Bank, Washington, DC, https://www.worldbank.org/en/topic/edutech/publication/digital-pathways-education-enabling-learning-impact.

ICDE

The 30th World Conference of the International Council for Open and Distance Education (ICDE) was held in New Zealand

From 10 to 13 November, the 30th World Conference of the International Council for Open and Distance Education (ICDE) was held in Wellington, New Zealand. Nearly 500 experts and scholars from around the world attended the event to exchange views on how to foster mutually beneficial teaching and learning, enhance the inclusiveness, scalability, and sustainability of education, and advance progress toward the education-related Sustainable Development Goals.

The conference focused on four key dimensions:

Accessibility and Resilience

Approaches that improve the accessibility and equity of education to those otherwise facing barriers to formal learning, including lifelong learners, and approaches related to making education practices and educational systems more reliable and responsive to adverse events.

Context and Quality

Considering top-level operating and practice models of higher education (macro and meso) that align policy, practice, and quality standards to promote education that is inclusive, scalable, and sustainable.

Indigeneity

Improving the representation of indigenous and other knowledge systems, particularly through increased participation and appropriate approaches to teaching and learning, assessment, and quality standards.

Innovation and Openness

Thinking outside the box, including engaging with the challenges and opportunities afforded by technology, artificial intelligence and machine learning, toward improved inclusivity, scalability, and sustainability. Additionally, those practices that encourage the creation, reuse, and sharing of resources in ways that improve collaboration, cost-effectiveness, and quality.

During the conference, the Global Smart Education Network (GSENet), initiated by Beijing Normal University, organized a high-level dialogue titled "Shaping AI or Being Shaped by It? Our Work, Our Leadership, and the Road Ahead" during the plenary session. The dialogue was chaired by Prof. Asha Singh Kanwar, Chair of the Governing Board of UNESCO's Institute for Information Technologies in Education (IITE) and Chair Professor at the Smart Learning Institute of Beijing Normal University.

The speakers engaged in in-depth discussions on topics such as the application of artificial intelligence in education, institutional governance, and the transformation of research paradigms. They shared practical experiences and strategic insights on navigating educational transformation in the age of intelligence.

For more details, please visit the link below:

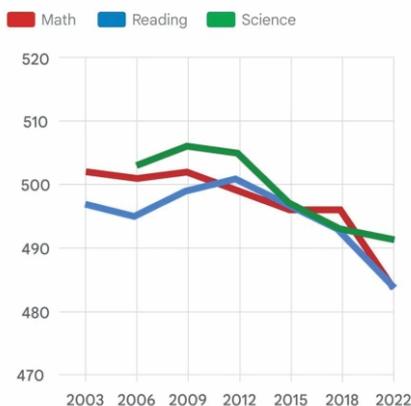https://www.icdeworldconference2025.com/conference-theme

Google

AI and the Future of Learning

On 6 November 2025, Google released a report entitled *AI and the Future of Learning*, which provides a systematic analysis of the transformative opportunities AI brings to education, the pressing challenges that must be addressed, and Google's approach to these developments. The core messages of the report can be summarized as follows.

Google November 2025

AI and the Future of Learning

Ben Gomes
Chief Technologist
Learning & Sustainability

Lila Ibrahim
Chief Operating Officer
Google DeepMind

Yossi Matias
VP & GM
Google Research

Christopher Phillips
VP & GM
Education

James Manyika
SVP
Research, Labs, Technology & Society

Trends in mathematics, reading and science performance

PISA test scores, OECD average

Math — Reading — Science

I. Learning Matters

The report emphasizes that learning is fundamental to human development and social progress. Although global access to education has expanded, major challenges persist, including inequitable opportunities, variations in learning quality, and declining learning outcomes—as reflected in the OECD PISA 2022 results. Public education systems also face increasing pressures such as funding gaps, teacher shortages, and post-pandemic learning loss. In this context, AI emerges as a pivotal force reshaping what it means to be well-educated and what skills learners need for the future.

II. Opportunities: AI's Promise for Learning

1. Unlocking the Power of Learning Science

AI can embed core principles from the science of learning—such as active engagement, deep practice, and spaced repetition—into everyday teaching. It also has the potential to open new frontiers for research on how people learn, by analyzing patterns of engagement, motivation, and "aha" moments.

2. Personalizing Teaching and Tutoring

The aspiration of personalized learning is not new, but AI offers new ways to realize it for large numbers of learners. AI can help build individualized learning pathways, diagnose gaps in understanding, and provide tailored feedback and support based on each learner's needs, goals, and context—whether or not a teacher is immediately available. In this way, AI can complement, though not replace, high-impact human tutoring.

3. Making (Almost) Anything Learnable

In an age of information abundance, AI can strip away unnecessary jargon, adjust explanations to a learner's prior knowledge and preferences, and present content through different modes. This allows learners to spend more time working within their zone of proximal development, turning complex or niche topics into areas that feel approachable and engaging.

4. Removing Barriers to Learning

For learners who lack access to quality education or who face barriers due to language, disability, or other circumstances, AI can transform content into more accessible forms—through translation, adaptation, and multimodal presentation—delivering learning materials at an appropriate level and format to reduce gaps.

5. A Helping Hand for Busy Educators

AI can serve as a powerful assistant for educators, taking on tasks such as lesson planning, content generation, and administrative work. This can free up teachers' time to focus on the uniquely human aspects of education: building relationships, nurturing curiosity, and providing the emotional and social support that AI cannot replace.

III. Challenges: Important Areas to Address

Like all major technological shifts, the integration of AI into education brings significant challenges. Some are familiar—such as privacy and safety—while others stem from the distinctive capabilities of AI. The report highlights five key areas of concern:

Accuracy and Objectivity

AI models can "hallucinate," generating false or misleading information. Although hallucination rates have declined as models are trained on more reliable sources and better evaluation methods, a deeper difficulty remains: judging which sources to trust and how to address subjectivity and bias in data.

Safety

Safety is essential for all users, and the obligation is especially strong in the case of minors. Key risks revolve around content or interactions that could cause physical or psychological harm.

Critical Thinking

A prominent concern is that students may "offload" too much thinking to AI, leading to "metacognitive laziness" and weakened deep-learning capacities. The crucial task, therefore, is to design AI systems that stimulate rather than replace higher-order thinking—through question-driven tutoring, prompts that require explanation and reflection, and tools that reduce unproductive cognitive load so that learners can concentrate on reasoning and problem-solving. Ultimately, however, the motivation for deep thinking still depends heavily on human relationships—encouragement, challenge, and social interaction with teachers and peers—so AI should be used to create more space for these interactions, not to supplant them.

Cheating and Learning Loss

Surveys indicate that some student uses of AI are widely perceived as academic misconduct, yet there is no consensus on where to draw the line between legitimate tool use and cheating. Norms are still evolving, and the report argues that cheating should not be viewed solely as an issue of individual moral failure requiring more policing. Rather, it reflects systemic questions about how educational institutions and assessment systems are designed.
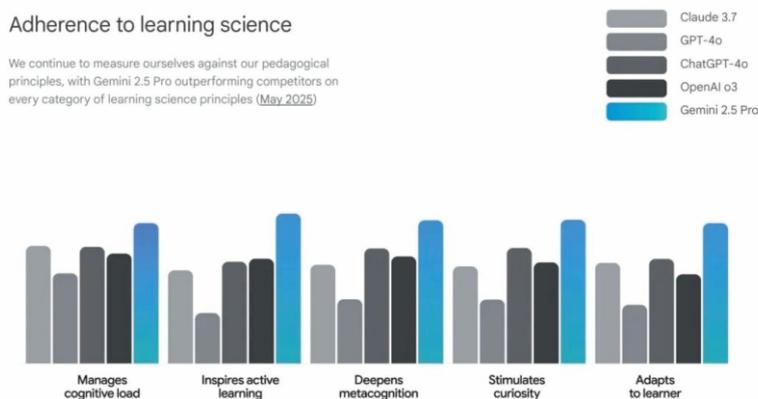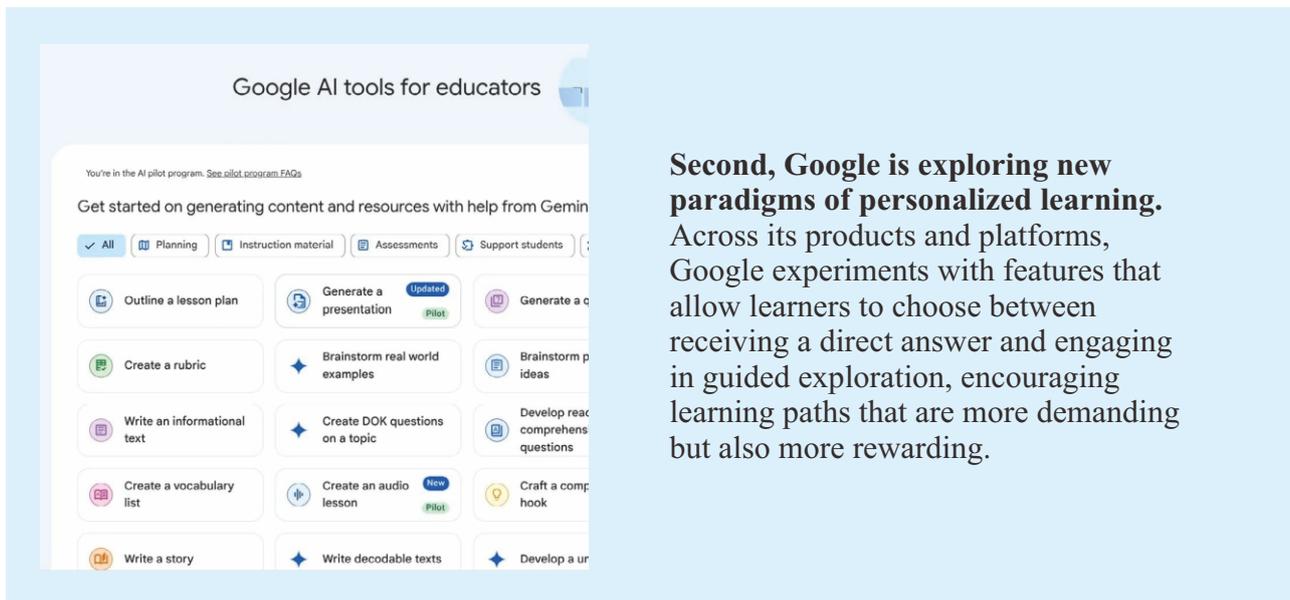
Equal Access

Realizing AI's promise for all requires tools that are accessible, affordable, and culturally and linguistically appropriate. There is a risk that the most motivated and already advantaged students will benefit disproportionately—the so-called "5% problem"—creating a biased impression of AI's overall effectiveness. The report stresses that every learner should receive support to use AI safely and meaningfully for educational purposes and to understand when and how to use it responsibly.

Ultimately, the report argues that the most important breakthroughs in AI may be societal rather than technical. As AI becomes more embedded in daily life, the key question will shift from anxiety about what the technology can do to a focus on how societies can shape and govern it so that it serves human interests. This process must be collaborative, involving experts, users, and researchers from the outset to ensure alignment with human values and goals.

IV. Google's Work on AI in Learning

In the final part, the report outlines Google's approach to integrating AI and education. **First, AI must be grounded in the science of learning.** Google aims to build models that embody sound pedagogical principles—such as managing cognitive load and stimulating curiosity—so that AI promotes genuine understanding rather than shortcuts.

Adherence to learning science

We continue to measure ourselves against our pedagogical principles, with Gemini 2.5 Pro outperforming competitors on every category of learning science principles (May 2025)

Legend: Claude 3.7, GPT-4o, ChatGPT-4o, OpenAI o3, Gemini 2.5 Pro

Categories: Manages cognitive load, Inspires active learning, Deepens metacognition, Stimulates curiosity, Adapts to learner

Second, Google is exploring new paradigms of personalized learning. Across its products and platforms, Google experiments with features that allow learners to choose between receiving a direct answer and engaging in guided exploration, encouraging learning paths that are more demanding but also more rewarding.

Third, Google is committed to supporting educators. By providing free AI-powered tools, the company seeks to reduce teachers' administrative burdens and lesson-planning workload, enabling them to focus on the most human parts of their role: inspiring, connecting, and caring for students.

Finally, all of this rests on a foundation of collaboration. Google emphasizes that it must work with the global education community—schools, universities, policymakers, researchers, civil-society organizations, teachers, students, and parents—to conduct pilots, gather evidence, refine best practices, and ensure that AI tools genuinely help learners and educators stay in control of their educational goals.

The report concludes by reaffirming that the aim is not to replace teaching, but to help human curiosity reach new heights. In the realm of learning, the greatest promise of AI lies in enabling every person to realize their full potential.

For more details, please visit the link below:

https://services.google.com/fh/files/misc/future_of_learning.pdf

Reference:

Ben Gomes，Lila Ibrahim，Yossi Matias，Christopher Phillips，James Manyika. AI and the Future of Learning.
https://services.google.com/fh/files/misc/future_of_learning.pdf

PLATFORM

National Smart Education Platform

Since the launch of the 14th Five-Year Plan, the Ministry of Education of China has resolutely implemented the important instructions of President Xi Jinping and the major decisions and deployments of the CPC Central Committee. By accurately assessing changes, responding to them in a scientifically sound manner, and proactively driving transformation, China has initiated and implemented the National Education Digitalization Strategy Action. Guided by the principles of connectivity first, content as the foundation, and collaboration as the key, and following an integrated, intelligent, and internationalized development pathway, China has taken the strengthening and effective use of National Smart Education Platform as the core lever to systematically promote the large-scale and normalized application of digital education.

As a result, China's digital education has shifted from quantitative expansion to a qualitative leap, becoming a critical pillar in advancing China's transition towards an education powerhouse. Notable progress has been achieved in promoting equitable access to quality education, lifelong learning, public education services, education governance, and international influence.

National Smart Education Platform has surpassed 178 million registered users, covering more than 200 countries and regions worldwide. Its international version supports access in the six official languages of the United Nations, with an average of 52 million daily visits and a cumulative total exceeding 72.6 billion visits. The platform has become one of the world's largest digital education resource centers and platforms, establishing a distinctive global brand for China's digital education.

A Rich and Comprehensive Repository of Learning Resources

The Platform has aggregated more than 130,000 high-quality resources for primary and secondary education, over 12,500 premium vocational education courses, and more than 145,000 high-quality higher education courses. It has formed a comprehensive education resource center covering the entire learning continuum—from early childhood education to postgraduate education—and encompassing all dimensions of education, including moral, intellectual, physical, aesthetic, and labor education.

# Delivering High-Quality Classrooms Across Regions

A wide range of applications—such as dual-teacher classrooms, resource-delivery classrooms, and master-teacher classrooms—are being widely implemented across regions. Through initiatives such as "MOOCs for the Western Regions", high-quality educational resources are crossing mountains and seas. Whether along the South China Sea coast or on the world's highest plateau, learners can access quality education through the Platform, effectively promoting the balanced distribution of high-quality educational resources.

Upgrading Teaching Quality

The Platform has integrated more than 60 application tools, providing free support for key teaching and learning scenarios, including student learning, teacher lesson preparation, academic tutoring, after-school services, and home–school collaboration. Supported by abundant resources and digital tools, advanced and effective pedagogical models—such as flipped classrooms, inquiry-based learning, and project-based learning—have broken free from traditional constraints and been comprehensively implemented, significantly enhancing overall teaching quality.

Empowering Teacher Professional Growth

Through the Platform, more than 500,000 online teacher professional learning and research communities have been established. Over 64 million teacher participations have been recorded in lesson preparation and teaching activities via the platform, and more than 90 million teacher training instances have been completed cumulatively. These efforts have substantially strengthened teachers' digital literacy and professional competencies, providing strong support for sustainable teacher development.

For more details, please visit the link below:

https://csmartedu.cn
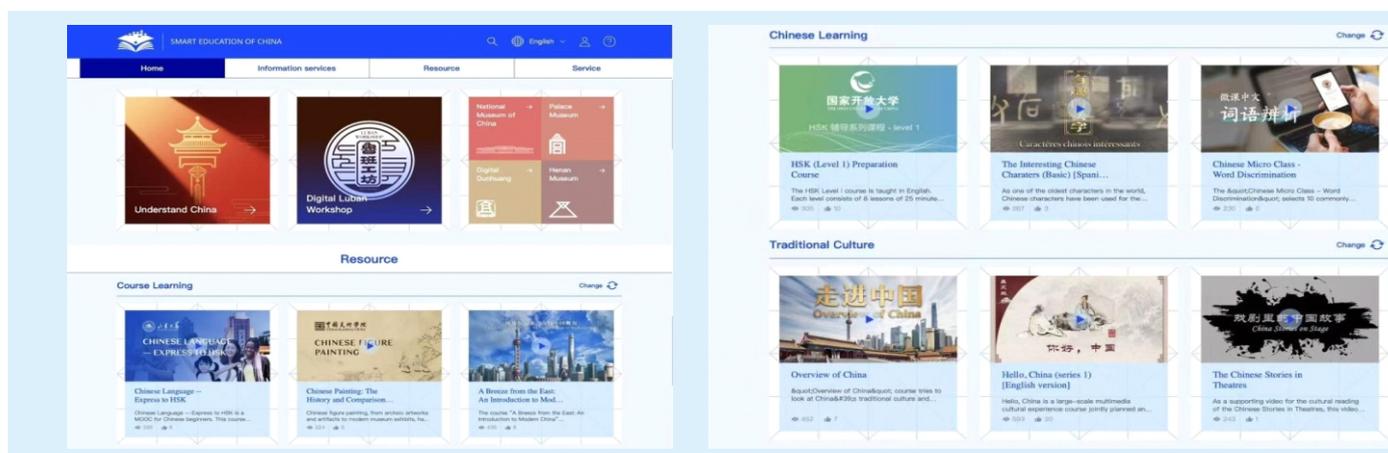
The World Digital Education Alliance is committed to establishing a global community in digital education. It aims to encompass the enhancement of dialogues and exchanges, the cultivation of practical collaborations, the establishment of a sustainable international cooperation mechanism, and the facilitation of the high-quality progression of digital transformation in education.

Editing & Compilation: WANG Menghan, WANG Junyi
Reviewed by: ZENG Haijun

Contact us