



UPDATED

Guidelines on the ethical use of artificial intelligence and data in teaching and learning for Educators

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Foreword

Artificial Intelligence (AI) represents one of the defining transformations of our time, fundamentally reshaping many sectors of the economy and society – including education. I am committed to ensuring that teachers and educators receive the support they need to make the most of the opportunities that AI can open. The ethical use of AI must be our guiding principle. Teachers and students need to understand when it is appropriate to use AI, and when it is not. I welcome this powerful wave of innovation, but we must ensure that it always serves people. Our approach must remain firmly human-centred.



These guidelines build on the Union of Skills strategy launched in 2025. As part of this strategy, the Commission presented a first proposal for an EU-27 Recommendation on human capital, calling on Member States to prioritise investment in education and skills development, particularly in the context of digital transformation and AI.

Later this year, as part of the Education Package, I will present the 2030 Roadmap on the Future of Digital Education and Skills. The Roadmap aims to ensure that our education systems are inclusive, future-ready, resilient and safe in the age of AI.

AI has enormous potential to create new learning opportunities, to transform teaching and assessment practices, and to help address both long-standing and emerging skills gaps. I have great confidence in European teachers – in their professionalism, dedication and motivation. In the context of AI, they are uniquely placed to act as ethical guardians for their students.

Europeans clearly recognise the importance of this challenge. In recent surveys, a large majority (87%) believe that all teachers should be equipped with the skills to use and understand AI. Similarly, 85% of citizens say that digital skills are necessary to use generative AI safely and responsibly, and 75% believe that everyone will need to be AI literate by 2030. This means teachers must be able to assess AI use critically – considering fairness, diversity, transparency, wellbeing, privacy and safety.

In 2022, we laid important foundations with the publication of the first Ethical Guidelines on the Use of AI and Data in Teaching and Learning for Educators, delivered under the Digital Education Action Plan. While these guidelines remain highly relevant and widely valued, the context and nature of AI use in schools have evolved rapidly.

With this updated edition, we aim to strengthen our support for teachers and educators across the EU. The guidelines are primarily addressed to teachers and school leaders, who make daily decisions about how AI is used in their classrooms. They provide practical tools and concrete examples of AI use in education, while highlighting key ethical and practical considerations.

To reflect the complexity of the issues and the diversity of educational settings, we brought together a broad group of experts – teachers, school leaders, public authorities, providers of AI-based educational technologies, and researchers – from the vibrant community of the European Digital Education Hub. I would like to express my sincere gratitude to all those who contributed their expertise and practical experience to this work.

With these guidelines, we take another step towards shaping an AI-enabled education system that is innovative, responsible and truly fit for the future.

Roxana Mînzatu
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Disclaimer

These guidelines are non-binding and are intended to support teachers, school leaders and education authorities in promoting safe, inclusive and trustworthy digital education environments, in line with European values and applicable EU legislation.

This text includes examples of digital tools, resources and initiatives, along with the names of the companies or organisations that provide them. These references are for illustrative purposes only, and do not imply endorsement by the European Commission. The authors have aimed to include freely accessible, widely used and diverse examples – especially those from Europe – wherever possible.

This document is intended to provide support to teachers and educators when using artificial Intelligence. It is not intended to provide guidance on the enforcement of the EU Artificial Intelligence Act (Regulation (EU) 2024/1689).



The Context for these Guidelines

Why these guidelines matter

Understanding and using artificial intelligence (AI) in education in an ethical and responsible way has become increasingly urgent. Since the first version of these guidelines was published in 2022, there has been an exponential growth in the use of AI by teachers and learners following the wave triggered by public access to generative AI (GenAI). This rapid uptake has created new opportunities and growing challenges for teachers, schools, and the wider community. From a regulatory perspective, the European Artificial Intelligence Act (2024) also has important implications for education. Alongside the General Data Protection Regulation (GDPR), it provides a legal framework based on a classification of risks that schools and teachers must take into account when introducing AI tools¹ into learning and school life.



AI and ethics in education

Integrating an ethical dimension into the use of AI means recognising ethics as a central part of digital and AI literacy. Students, from an early age, should be equipped not only with technical and regulatory knowledge but also with the values and critical awareness needed to ensure that AI is used for the benefit of all and with respect for human rights.

Teachers and school leaders also need to be aware of both the opportunities and limitations of AI. This includes being able to evaluate whether AI applications support learning objectives, whether they are sustainable in the long term, and whether their use contributes to the common good.

¹ In these guidelines, the term “AI tool” is used throughout to refer broadly to applications of artificial intelligence and Generative AI in educational settings, including platforms, applications, services, and technologies. This includes what may also be referred to as “AI systems” that is used specifically when referring to definitions and obligations set out in the Artificial Intelligence Act (Regulation (EU) 2024/1689), referred to as the EU AI Act, where it carries a precise legal meaning.

How the guidelines are organised

The guidelines are organised into three main parts:

- **Core principles and legal context**, including the AI Act, GDPR, and the ethical considerations that underpin responsible AI use in education.
- **Guiding questions and scenarios**, which provide examples for applying these principles in classroom and school settings.
- **Background resources**, such as technical definitions, reference frameworks and further policy context, which can be explored as needed.

How to use the guidelines

Whatever the context in which you work, whether you have autonomy in choosing AI tools or not, are in a high- or low-technology environment, or are managing different age groups of students, it is not necessary to read the guidelines in their entirety. Teachers may wish to begin with the guiding questions and scenarios,

which can be used for discussion in staff meetings or professional learning sessions. School leaders may wish to focus on the school-level guiding questions and the sections on regulation and policy. Policymakers and CPD providers can draw on the full document to inform strategic planning and professional learning design.

These guidelines are written to support a wide range of teachers and school leaders, from those just beginning to explore AI to those with advanced digital skills. The focus is on helping them to make informed choices, build confidence step by step, and develop the necessary skills to take advantage of AI while managing potential risks.



Using AI in Education across the EU

AI in educational context: challenges and opportunities

What is Artificial Intelligence?

The definition of an Artificial Intelligence (AI) system as adopted in the EU AI Act is as follows:

“**AI system** means a machine-based system that is designed to operate with varying levels of autonomy and that may exhibit adaptiveness after deployment, and that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments.”

Generative AI is a specific category of AI tools and systems designed not only to analyse data but to adapt and generate content such as text, images, code, or music. These systems (e.g. large language models, diffusion models for image generation, and multimodal AI tools) are trained on vast datasets and can produce ‘human-like’ outputs based on prompts or instructions.

While offering opportunities and enabling the development of individual uses, these technologies pose significant risks, including bias, privacy issues, lack of transparency, and over-reliance, which both educators and school leaders need to understand and navigate safely and responsibly.

The nature of AI

AI systems and tools, including, but not limited to, generative AI, predictive models, classifiers, recommenders, and autonomous agents, operate by processing vast datasets to identify statistical patterns. While these can produce highly sophisticated and human-like outputs, they do so automatically without comprehension, awareness, or intent. Understanding this distinction dispels the misconception that AI is all-knowing or consistently correct, and helps learners assess its reliability, limitations, and potential impact. The term “AI tools” is generally used throughout these guidelines to emphasise their practical use in educational settings.

As AI becomes more integrated into education, it is changing how learners research, write, and collaborate, and how educators plan learning experiences and provide feedback. A foundational understanding of AI supports educators in deciding when and how

to use AI tools in ways that align with their pedagogical vision and priorities, the curriculum they teach, as well as their students’ needs and practices.

Ethical and legal considerations are not an add-on to the technical use of AI in education, they are fundamental to how these technologies should be understood, adopted, and applied in teaching, learning, and assessment. These guidelines are grounded in the belief that values, context, and accountability must shape every aspect of how AI is used in educational settings. The inclusion of ethics here reflects a deeper commitment to ensure that educational uses of AI respect human dignity, promote fairness, and preserve the integrity of learning, in line with the fundamental values of the European Union.

What role does data play in the use of AI in education?

Schools manage a wide range of educational data, including personal information about students, staff, and parents. This data, often stored in student information systems, can include academic records, family contacts, special educational needs and assessment results. When learners use digital tools, they also generate trace data (such as mouse clicks, data on opened pages, the timing of interaction, or key presses). This data can be combined to capture each student's online behaviour.

AI tools increasingly use this data to personalise learning and support decision-making. While this opens opportunities for improving teaching, learning and assessment, it also raises ethical concerns. Teachers should be aware that many AI tools, even those commonly used in schools, may collect and process student data to refine their systems. It is important to recognise that AI can be embedded in everyday digital tools (e.g. word processors, image

creators etc.), not just in high-profile or advanced applications. In some cases, this can happen without clear disclosure or explicit consent from learners, parents, or educators.

This can create an imbalance where commercial technology providers have more access to and control over educational data than the schools and teachers who generate it. These developments raise important questions about data ownership, consent, and institutional autonomy, and who really benefits from AI development in education. As AI tools depend on large volumes of data and operate through complex algorithms, schools must ensure that data is handled responsibly and in line with **GDPR**, the **AI Act**, and national legislation. Clear policies and procedures are essential to safeguard privacy and promote ethical use of data within educational settings.



Common (mis)perceptions about AI

There are many assumptions and concerns about AI and its short and long-term impacts on our education systems and on society in general. Here are some of the most common perceptions about the use of AI and data in the education context.

“AI is the same as generative AI”

A common misconception in education is to equate AI solely with generative AI tools. In reality, AI has been in use in educational settings long before these high-profile applications emerged. From **adaptive learning platforms** that personalise student pathways based on performance, to **automated grading systems** that offer immediate feedback, to early intervention tools that identify students at risk, AI has been operating behind the scenes to assist teaching, learning and assessment. These earlier AI applications, while less visible than today's text and image generators, have been analysing data, recognising patterns, and making predictions to support educators' decision-making. Understanding this broader AI landscape can help teachers see that **generative AI is only one part** of a wider technological shift. Focusing only on generative AI tools risks missing the full range of opportunities and challenges AI can bring to education.

“AI has no role in education”

It is not uncommon, or even unreasonable, for educators to feel that AI tools are too complex or unreliable to be used safely in schools. **AI is already influencing how we learn, work, and live, and education is being shaped** by the growing availability of AI tools designed specifically to support learners, teachers, and school leaders. According to the 2025 Joint Research Centre (JRC) report **Generative AI Outlook Report**, teachers are among the top 10% of professions most frequently exposed to AI. **Everyone should have the opportunity to contribute to and benefit from AI developments.** Making legal and ethical principles a central part of how we think and talk about AI in education opens the door for these technologies to be designed and used in ways that are trustworthy, fair, and inclusive, to the benefit of all members of the school community.

“AI is neutral and objective”

It is often assumed that AI tools are inherently neutral in the way they propose options for decision-making. In an education setting, this can include grading assignments, recommending learning paths to individual students, or assessing students' performance. In reality, this view overlooks the fact that **AI tools are aligned and trained primarily on human-generated data and reflect the values, assumptions, and gaps present in that data.** When used in classrooms, these tools can unintentionally reinforce existing inequalities or misinterpret student needs, particularly for those from underrepresented backgrounds. Assuming that AI offers objective judgement can conceal these risks or lead to overconfidence in what is proposed by the AI tool. At the same time, when designed responsibly and used with critical oversight, **AI tools can offer opportunities to improve access and inclusion in education**, as well as in everyday life and at work.

“AI will undermine my role as a teacher”

Some educators express concern that AI could undermine or even replace their role. However, when used appropriately by teachers, **AI tools can support the design of engaging learning experiences.** AI can take on an enabling role, helping teachers to design learning experiences that empower students to be creative, think critically, solve real-world problems, and collaborate effectively. They can help **reduce routine tasks, provide timely insights into student progress, and create more space to foster creativity, critical thinking, real-world problem-solving, and collaboration.** As the use of AI becomes more integrated into classroom practice, it remains essential to monitor its impact and ensure that it is applied in ways that are ethical, transparent, and that preserve teacher agency.

“I don’t understand enough about how AI works”

Many educators feel uneasy about AI, particularly as the technology continues to evolve rapidly. Some worry about losing control, making mistakes, or relying on systems they do not fully understand. Others might feel that AI is too complex or believe that they lack the skills and knowledge required to use it effectively. These concerns are valid, particularly in light of broader issues such as data privacy, algorithmic bias, and transparency.

Still, uncertainty or fear should not be the sole reason to avoid AI. **Many educators, regardless of technical background, are already using AI tools creatively and effectively.**

With the right professional opportunities and support, tailored to different levels of experience, teachers can build the confidence to understand how AI works, recognise its limitations and risks, and use it responsibly to achieve learning goals, personalise instruction and reduce administrative workload.



Examples of AI use in education

AI tools are playing an increasingly prominent role in classrooms across Europe, supporting teaching, learning, and assessment in diverse and evolving ways. Here, we explore some practical examples of how these tools are being used across different educational contexts.

AI tools have the potential to enhance teaching, learning and assessment practices, and help school leaders improve how they plan, organise, and run their schools. These guidelines focus primarily on **learning with AI** and, in particular, where teachers and learners use AI to support teaching, learning, and assessment. The focus is not explicitly on **learning about AI** to facilitate AI literacy as part of broader digital literacy.

It is important to distinguish between AI developed specifically for educational use and General-Purpose AI models. **Educational AI** includes systems such as adaptive learning platforms, which are designed with learning objectives and classroom contexts in mind. **General-purpose AI** refers to large and powerful models trained with a large amount of data using self-supervision at scale. In particular **large generative AI models** allow for flexible generation of content, in the form of text, audio, images or video, that can readily accommodate a wide range of distinctive tasks. Nevertheless, they are not created for educational contexts and may lack the appropriate safeguards. Understanding this distinction can support more critical reflection on how and when to use AI in schools.

Traditionally, educational AI tools were developed for specific educational applications, such as providing feedback, supporting personalised learning, or facilitating collaborative inquiry. The appropriateness of a particular AI technique (rule-based AI, machine learning, or generators) for a specific educational purpose was evaluated during the development process. With

the increasing use of general-purpose AI, more diverse use cases in education are becoming possible; consequently, the task of assessing the appropriateness for educational purposes is also shifting from developers to educational professionals and teachers. While evidence-based research on the impact of AI in education is still evolving, it remains essential for teachers and school leaders to adopt a critical, reflective approach when deciding how and when to use these tools.

To illustrate how AI is being used in education, the examples are presented according to their educational purpose and context of use, and are organised according to two dimensions:

The first category focusses on **who** is using the AI:

- 🕒 **Teacher supporting** – Using AI to support the teacher.
- 🕒 **Student supporting** – Using AI to support students' learning.
- 🕒 **School supporting** – Using AI to support diagnostic or school-wide planning.

The second category relates to **when** the AI is used:

- 🕒 **For preparation** – Using AI to prepare for learning and teaching.
- 🕒 **For learning and teaching** – Using AI during learning and teaching.
- 🕒 **For assessment and reflection** – Using AI to assess, evaluate and reflect.

Combining to clarify the “two dimensions” (who and when) provides a framework for positioning examples of AI use in education, while acknowledging that this is an evolving landscape, some applications are already well integrated into practice, whereas others are emerging or remain more prospective in nature. The examples that follow represent a range of possible uses but do not capture the full extent of what may be possible or relevant in every educational context.

Teacher supporting

For preparation

Lesson planning to generate customised content, by providing outlines and organising learning objectives, activities and resources.

Aligning curriculum content to map lesson objectives, activities, and assessments to the subject curriculum.

Designing learning materials to recommend or adapt digital education content that aligns with different skill levels, needs and interests of students.

Supporting creative activities to generate visual art prompts, creative writing themes, or performance-based activity suggestions tailored to specific learning outcomes.

Curating digital education content to identify and organise links between subjects (e.g. history and literature, business and citizenship) and to propose integrated thematic lessons or projects.

Practising and testing instructional strategies to simulate virtual students with diverse behaviours, learning needs, and responses, allowing teachers to practise teaching methods and classroom management in realistic interactions.

For learning and teaching

Differentiating learning to tailor content format, materials, feedback and pace to each student's strengths and needs, including targeted interventions to support learners with specific learning difficulties.

Enabling interactive and experiential learning to provide real-time explanations and feedback while enabling interactive, experiential learning through simulations, gamification, creative tasks, and augmented reality.

Supporting collaborative learning to facilitate group work through intelligent pairing and providing inputs on how a group is working together based on the level of interaction between members.

Designing immersive experiences to create learning activities by using AI tools that generate historically grounded dialogue, simulate key events, and present multiple perspectives for classroom discussion or project work.

Enhancing language learning to offer real-time translation, speech recognition, personalised vocabulary practice, interactive conversation simulations that adapt to learners' proficiency levels, real-time automated feedback on pronunciation, comprehension and fluency.

Supporting inquiry-based learning to guide students through open-ended investigation and problem-solving using adaptive tools, real-time feedback, and interactive simulations across subjects, at their own level and pace.

For assessment and reflection

Designing flexible assessment to create varied assessment activities and question types, analyse learning objectives, and generate differentiated assessments and rubrics based on students' progress, preferences and needs.

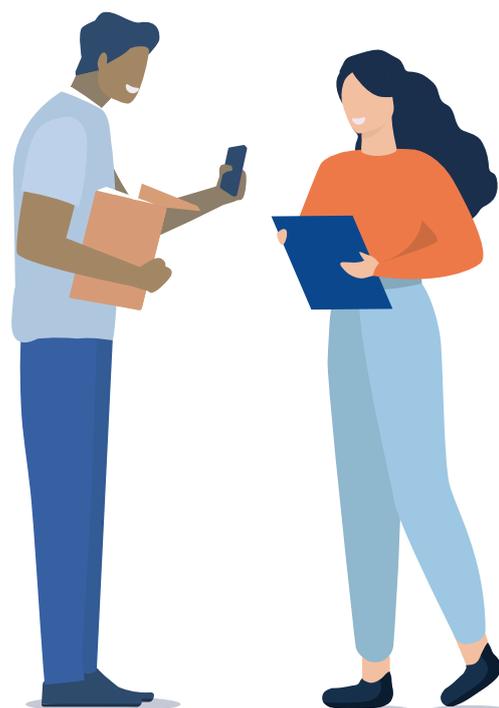
Automating repetitive correction tasks to mark routine assignments using AI tools that correct short-answer and multiple-choice responses, flag common errors in open-ended work, and suggest feedback based on teacher-defined criteria.

Assisting written assessment to evaluate and provide feedback on student writing using AI tools that analyse grammar, structure, coherence, and vocabulary.

Supporting peer assessment to support more effective peer assessment activities through targeted matching of students based on their profiles and/or submitted work.

Encouraging student self-reflection to support learner reflection on their progress through personalised prompts, spaced practice, targeted questioning, and feedback that helps them identify gaps, monitor progress and seek additional help or resources when needed.

Providing guidance services to support students to identify new learning and development goals, and to offer recommendations for next steps based on an analysis of student progress and/or student self-reflection.



Student supporting

For preparation

Researching with generative AI to gather information and explore new topics using generative AI tools which provide summarised, conversational responses instead of standard search results.

Practicing subject knowledge to interact with tutoring agents that explain concepts, solve problems step-by-step, and offer instant feedback.

Exploring topics independently to learn through AI-driven simulations and visualisations that adapt to the student's pace and interests.

Organising and drafting assignments to organise ideas, create outlines, and develop written or presentation content using AI tools that provide structural guidance, language suggestions, and ongoing feedback throughout the drafting process.

Creating customised study aids to generate flashcards, summaries, diagrams or concept maps, and to schedule spaced repetition for improved retention.

For learning and teaching

Practicing problem-solving to explore coding, maths, or science tasks with AI support that offers hints, explains errors, and guides logical reasoning.

Developing creative expression to experiment with AI tools for drawing, composing music, or generating creative writing, receiving suggestions and instant previews.

Enabling simulations to support understanding through interaction with AI agents that simulate key figures and present events/phenomena from multiple perspectives and contexts

Learning foreign languages to use AI apps that adapt vocabulary, pronunciation, and grammar tasks to each learner's level and progress.

Visualising patterns to interact with AI-enhanced maps, datasets, and simulations that show real-time changes in population, climate, or land use.

Enhancing physical education by using AI-supported apps that analyse movement, provide real-time feedback on technique, and suggest personalised training plans.

For assessment and reflection

Conducting formative assessment and feedback to help check understanding through low-stakes quizzes, targeted questions, and instant feedback that guide learning without assigning grades.

Reviewing creative work to reflect on personal artworks with the help of AI tools that prompt students to describe their techniques, artistic choices, and alignment with the intended message or style.

Tracking progress and reporting to review their own progress over time via AI-generated summaries or dashboards that highlight strengths, challenges, and areas for improvement.

Reviewing and analysing lessons to support students in revisiting key concepts and reflecting on their engagement by providing insights or visualisations of their own learning patterns and activities.

Supporting self- and peer-reflection to reflect on their learning process or give feedback to peers through personalised prompts, guided comparisons, or structured peer input.



School supporting

For preparation

Managing routine school operations to support planning of timetables, classroom use, and materials using AI-driven forecasting and real-time operational data.

Organising school records and documents to classify, tag, and retrieve administrative documents such as policies, meeting minutes, or school forms using AI-enhanced filing and search systems.

Identifying dropout risk to analyse academic performance and school attendance, detect students at risk, and enable timely interventions.

Structuring academic data and information to enable automatic transfer into the information systems of educational organisations and institutions (local, regional, national).

Modelling budget scenarios to simulate and optimise budget allocations across departments or school programmes using predictive models based on historical data and projected needs.

Supporting enrolment planning to analyse historical data and identify enrolment patterns to prepare for future intake and manage application information more efficiently (while leaving decisions to the staff and committees in charge).

For learning and teaching

Guiding resourcing decisions to help school leaders identify areas where resources may need to be adjusted or strengthened by monitoring aggregated data on student participation, performance, and support trends.

Automating routine communications to streamline reminders, attendance alerts, calendar updates, and school

announcements using AI tools that personalise messages and manage delivery across platforms.

Supporting early identification of learning needs to highlight patterns in classroom activity that may indicate learning challenges and help plan timely and appropriate resource support.

Facilitating home-school communication to offer multilingual, personalised, and automated support to current and prospective students and parents through an AI chatbot.

Preparing statistical reports to assist admin staff in compiling and formatting data for education authorities using AI tools that extract and organise information from school systems for review.

For reflection and evaluation

Providing guidance platform services to support student development by offering tailored career coaching, setting learning goals, and monitoring progress.

Planning school professional development to analyse teacher professional learning needs, identify staff skill gaps and recommend targeted professional learning paths.

Mapping curriculum and school plans to analyse curriculum elements (e.g. syllabuses, frameworks, guidelines, and policies) alongside school plans to help identify gaps, strengths, and opportunities.

Auditing digital tool usage to evaluate how digital tools and platforms are used across the school, identify engagement patterns, and highlight areas needing additional training or support.

Monitoring school improvement goals to track progress against the school's strategic priorities using AI-generated dashboards that visualise indicators such as attendance, attainment, or staff professional learning uptake.



EU policies on digital education and the AI regulatory framework

These guidelines reflect the European Union's commitment to human-centric, values-driven digital transformation. They build on the vision of the Union of Skills and on the proven success of the Digital Education Action Plan (2021-2027). They also take into account the European Declaration on Digital Rights and Principles for the Digital Decade. They contribute to the EU's policy and regulatory framework on AI, related to the AI Continent Action Plan and the implementation of AI Act.

EU policy context for these guidelines

The Union of Skills

The Union of Skills (March 2025) responds to the need to equip people for a competitive European Union with the skills they should develop in their educational, professional, social and civic lives. Its goal is to build a resilient, innovative, inclusive and globally competitive Europe by transforming how skills are developed, recognised, and used. It has three core objectives: Empower People Across Europe, Support Business Competitiveness and Resilience and Enable Skills Mobility Across the EU.

In the Union of Skills, digital education is a key enabler for developing Europe's human capital. This vision aims to ensure that European citizens are well-equipped to navigate an increasingly digital society and economy, particularly with the growing use of AI, thereby contributing to a competitive and resilient Union.

Based on the proven success of the **Digital Education Action Plan 2021-2027 (DEAP)**, which set out a common approach to high-quality, inclusive and accessible digital education in Europe, the *Union of Skills* supports the sustainable and effective adaptation of the education and training systems of EU Member States for the digital age. It promotes the digitalisation of teaching practices, improvement of digital infrastructure, and the development of digital skills, including AI and data-related skills for both educators and learners at all levels of education.

European digital rights and principles

The Declaration on Digital Rights and Principles for the Digital Decade sets out a European approach to digital transformation that places individuals at its core, is firmly rooted in the European Union's fundamental values and rights and seeks to empower people to fully enjoy the opportunities that the digital transition is bringing.

The Declaration's key principles are built around six main themes:

- Putting people at the centre of digital transformation.
- Promoting inclusion and solidarity through access to digital technologies.
- Ensuring freedom of choice and informed interaction with AI.
- Fostering democratic participation in the digital space.
- Increasing safety, security and empowerment, especially for young people.
- Promoting sustainability and the green transition by minimising the environmental impact of digital technologies.

The AI Continent Action Plan and Apply AI strategy

The **AI Continent Action Plan** (2025) outlines a set of actions to make the EU a global leader in artificial intelligence. It aims

to boost investment, develop AI talent and increase AI uptake across economic sectors, and to shape the future of AI in Europe. The **'Apply AI' strategy** (2025) also aims to enable European companies to be at the forefront of AI globally in ten strategic sectors and to improve the quality of services in the public sector.

It offers education an opportunity to mobilise the EdTech sector for both educational and administrative purposes. The strategy will promote AI literacy training that leads to micro-credentials and increases AI uptake across economic sectors and job profiles.

The EU AI regulatory framework

Understanding how EU regulations, especially the AI Act and GDPR, apply in education can help ensure that AI is used safely, fairly, and transparently. While schools do not typically develop AI tools, they are responsible for their selection and implementation. Knowing which roles and systems are covered, and what practices are restricted, can enable educators and school leaders to make informed decisions that align with legal and ethical standards.

EU Artificial Intelligence Act (AI Act)

The European Union has taken a globally pioneering role in regulating AI through the **EU Artificial Intelligence Act (2024)**. This legislation sets out binding rules to ensure that AI systems are safe, trustworthy, transparent, and aligned with fundamental rights. The AI Act adopts a risk-based approach, which means that the higher the risk of harm to health, safety, or the fundamental rights of persons, the stricter the rules. It defines:

- i. certain AI practices as prohibited because of their unacceptable level of risk;
- ii. the use of AI in some areas considered as 'high risk', due to the potential impact on health and safety or the fundamental rights of persons, resulting in obligations for providers and deployers;
- iii. disclosure obligations where a risk could arise from a lack of transparency around the use of certain types of AI systems.

The AI Act introduces a right to explanation for affected individuals, which could include teachers and learners, to obtain "clear and meaningful explanations" of the role of the AI system in the decision-making procedure and the main elements of the decision taken by the deployer when such a decision produces legal effects or similarly significantly affects that person in a way that they consider to have an adverse impact on their health, safety or fundamental rights (Article 86).

This right could be seen as strengthening transparency and enabling users to understand the logic and significance of AI-assisted decision-making, including where it may affect educational outcomes, access, or progression. The Act also sets transparency

obligations (Article 50), including requirements to inform users when they are interacting with an AI system (Article 50(1)) and to clearly label AI-generated content (Article 50(2)). These provisions are particularly relevant in education, where clarity about the source and nature of content is essential to maintaining trust and supporting responsible use.

The AI Act defines AI literacy (Article 3(56)) as the skills, knowledge, and understanding that enable providers, deployers and affected persons to make informed use of AI systems, and to be aware of both the opportunities and risks of AI and possible harm it can cause. Article 4 further requires providers and deployers of AI systems to ensure a sufficient level of AI literacy for their staff and others dealing with the operation and use of AI systems on their behalf. They should take into account staff technical knowledge, experience, education and training, along with the context in which the AI systems are used and the individuals targeted by such systems.



Prohibited AI practices

The AI Act implementation includes **Guidelines on prohibited artificial intelligence (AI) practices**. In the education context,

Article 5(1)(f) prohibits the use of AI systems designed to detect or infer a person's emotions in workplaces and educational settings, except where such systems are used for medical or safety-related reasons.

Table 1: Examples from the Guidelines on prohibited AI practices.

- An AI-based application using emotion recognition for learning a language online outside an education institution is not prohibited under Article 5(1)(f) AI Act. By contrast, if students are required to use the application by an education institution, the use of such emotion recognition system is prohibited.
- An education institution using AI-based eye tracking software when examining students online to track the fixation point and movement of the eyes (gaze point, e.g., to detect if unauthorised material is used) is not prohibited, because the system does not identify or infer emotions. By contrast, if the system is also used to detect emotions, such as emotional arousal and anxiousness, this would fall within the scope of the prohibition.
- Using an emotion recognition AI system by an education institution to infer the interest and attention of students is prohibited. By contrast, if only deployed for learning purposes in the context of a role-play (for example, for training actors or teachers), emotion recognition systems are allowed if the results cannot impact the evaluation or certification of the person being trained.
- Using an emotion recognition AI tool by an education institution during admissibility tests for new students is prohibited.
- Using an AI system that allows to capture students talking to each other via their phones or other channels during online lectures by an education institution is not prohibited, since it does not infer emotions. By contrast, if the system is also used to detect emotions, such as emotional arousal, anxiousness and interest, this would fall within the scope of the prohibition.
- An education institution employing an emotion recognition AI system on both teachers (workplace) and students (education) is prohibited.

Education and training institutions at all levels fall under the scope of the prohibition in Article 5(1)(f) AI Act, including vocational schools and continuous training, regardless of the students' ages or mode of learning (e.g. online, in-person or blended).

High-risk AI systems in education

High-risk AI systems are defined in accordance with Article 6 of the AI Act, together with Annex I and Annex III. Annex III sets out eight areas where the use of AI is considered particularly sensitive and lists AI systems that pose significant risks to health, safety, and fundamental rights.

Education is explicitly included in 'high-risk' areas. AI tools used for admissions, grading, behavioural monitoring or student progress

tracking, typically used in schools, are classified as high-risk under Annex III, Point 3. However, there may be specific cases in which AI systems referred to in Annex III do not present a significant risk of harm to the legal interests protected under those areas, because they do not materially influence the decision-making or do not harm those interests substantially.

An AI system that does not materially influence the outcome of decision-making is one that neither affects the substance nor result of that decision, whether human or automated. This may apply when one or more of the conditions in Table 2 are fulfilled (Recital 53 of the AI Act). These conditions apply only to the classification of high-risk systems under Article 6 and should be distinguished from prohibited practices under Article 5.

Table 2: Conditions where AI systems do not materially influence decision-making.

- The first such condition should be that the AI system is intended to perform a narrow procedural task, such as an AI system that transforms unstructured data into structured data, an AI system that classifies incoming documents into categories or an AI system that is used to detect duplicates among a large number of applications. Those tasks are of such narrow and limited nature that they pose only limited risks which are not increased through the use of an AI system in a context that is listed as a high-risk use in an annex to the Regulation.
- The second condition should be that the task performed by the AI system is intended to improve the result of a previously completed human activity that may be relevant for the purposes of the high-risk uses listed in Annex III. Considering those characteristics, the AI system provides only an additional layer to a human activity with consequently lowered risk. That condition would, for example, apply to AI systems that are intended to improve the language used in previously drafted documents, for example in relation to professional tone, academic style of language or by aligning text to a certain brand messaging.
- The third condition should be that the AI system is intended to detect decision-making patterns or deviations from prior decision-making patterns. The risk would be lowered because the use of the AI system follows a previously completed human assessment which it is not meant to replace or influence, without proper human review. Such AI systems include for instance those that, given a certain grading pattern of a teacher, can be used to check *ex post* whether the teacher may have deviated from the grading pattern so as to flag potential inconsistencies or anomalies.
- The fourth condition should be that the AI system is intended to perform a task that is only preparatory to an assessment relevant for the purposes of the high-risk AI systems, thus making the possible impact of the output of the system very low in terms of representing a risk for the assessment to follow. That condition covers, inter alia, smart solutions for file handling, which include various functions from indexing, searching, text and speech processing or linking data to other data sources, or AI systems used for translation of initial documents.

To ensure traceability and transparency, a provider who considers that an AI system is not high-risk based on the conditions referred to above should prepare documentation of the assessment before that system is placed on the market or putting it into service and should provide that documentation to national competent authorities upon request. Such a provider should be obliged to register the AI system in the EU database established under the Regulation.

Specifically, **high-risk AI systems** are subject to **strict obligations** before they can be put on the market:

- Adequate risk assessment and mitigation systems.
- High-quality of the datasets feeding the system to minimise risks of discriminatory outcomes.
- Logging of activity to ensure traceability of results.
- Detailed documentation providing all information necessary on the system and its purpose for authorities to assess its compliance.
- Clear and adequate information to the deployer.
- Appropriate human oversight measures.
- High level of robustness, cybersecurity and accuracy.

In any case, AI systems used in high-risk use-cases listed in Annex III of the AI Act should be considered to pose significant risks of harm to the health, safety or fundamental rights if the AI system implies profiling within the meaning of Article 4, point (4) of Regulation (EU) 2016/679 or Article 3, point (4) of Directive (EU) 2016/680 or Article 3, point (5) of Regulation (EU) 2018/1725.



Table 3: High-risk AI systems in Education and vocational training.

- AI systems intended to be used to determine access or admission or to assign natural persons to educational and vocational training institutions at all levels. Annex III, 3 (a)
- AI systems intended to be used to evaluate learning outcomes, including when those outcomes are used to steer the learning process of natural persons in educational and vocational training institutions at all levels. Annex III, 3 (b)
- AI systems intended to be used for the purpose of assessing the appropriate level of education that an individual will receive or will be able to access, in the context of or within educational and vocational training institutions at all levels. Annex III, 3 (c)
- AI systems intended to be used for monitoring and detecting prohibited behaviour of students during tests in the context of or within educational and vocational training institutions at all levels. Annex III, 3 (d)

Further guidelines on high-risk practices are expected to be published in Q1 2026. The obligations regarding high-risk systems listed in Annex III will apply as of 2 August 2026.

Risk related to transparency

Transparency obligations for certain AI systems are set out in Article 50. This includes the obligation for providers to inform individuals when they are interacting with AI systems, such as chatbots. Additionally, AI systems generating synthetic audio, images, video or text contents, must be marked in a machine-readable format and clearly identifiable as artificially generated or manipulated. Also, deployers of an AI system that generates or manipulates image, audio or video content constituting a deep fake, shall disclose that the content has been artificially generated or manipulated.

These obligations are particularly important in education, where generative AI may be used to create learning materials, provide feedback or support communication. Clear labelling helps to maintain trust and prevent misuse.

General Data Protection Regulation (GDPR)

The GDPR applies to the processing of personal data in education. Personal data refers to any information relating to an identified or identifiable individual, while special categories of personal data (such as health data, ethnicity or political opinions) are subject to stricter safeguards. Education institutions act as data controllers when they decide how and why personal data is processed, while other parties may act as processors on their behalf.

As data controllers, education institutions communicate clearly and accessibly about how they process personal data (Articles 12 - 15 of the GDPR). This includes using concise, plain language, especially when the information is intended for children. The GDPR also requires a **data protection impact assessment (DPIA)** to be carried out before implementing systems, including AI, that may pose a high risk to individuals' rights and freedoms (Article 35).

In addition, Article 27 of the AI Act requires educational institutions, as deployers of AI systems, to carry out a fundamental rights impact assessment (**FRIA**) for AI tools that may be considered high-risk. This assessment helps identify potential risks to individual or group rights and specify actions to mitigate those risks.

Ethical considerations and requirements underpinning the use of AI in education

Ethical considerations

In revising these guidelines, five key considerations have been identified that underpin the ethical use of AI and data in teaching, learning, and assessment. These updates reflect evolving practices and expectations around the use of AI in education and are informed by the *Ethics Guidelines for Trustworthy AI*, which played a significant role in shaping the original guidelines. Where changes have been made to the ethical dimensions, these are explained to clarify the rationale behind the adjustments and to ensure continued relevance and practical application in today's educational contexts.

Human dignity encompasses the right to privacy, human autonomy, and human agency, and relates to the right of a person to be respected and treated in an ethical manner regardless of race, gender, religion, culture, or linguistic background. Central to this principle is the recognition of each individual's intrinsic value. Approaching individuals with respect for that value, rather than viewing them as data objects or a means to an end, is at the heart of the human-centric approach to AI.

Fairness relates to everyone being treated fairly in the social organisation. Clear processes are required so that all users have equal access to opportunity. These include equity, inclusion, non-discrimination, and fair distribution of rights and responsibilities.

Trust/Trustworthiness involves ethical principles based on fundamental rights and includes dimensions such as vulnerability of learners, power dynamics, and critical thinking. Trust relates to the confidence that stakeholders have that AI is being used in a fair and transparent way that promotes educational good practice and the best interests of students. An AI tool is trustworthy when it is consistently reliable, transparent about how it works, respects privacy, avoids bias, and supports learning in ways that align with the values of the school community.

Academic integrity is a foundational principle as it is integral to the learning process. It extends beyond tools; it permeates mindsets, competencies, and the broader culture of education. It is about using AI in an honest and ethical manner such as not misrepresenting contributions, giving proper attribution to the ideas and work of others and designing assessments that remain valid in the era of generative AI. In short it means fostering a culture where values, critical thinking, and human agency coexist with technological innovation.

Justified choice relates to the use of knowledge, facts, and data to justify necessary or appropriate collective choices by multiple stakeholders in the school environment. It requires transparency and is based on participatory, collaborative models of decision-making, as well as explainability.

These ethical considerations are intrinsically valuable and worth striving for in education. They guide educators and school leaders in their decisions about the use of AI tools and general-purpose AI models in education. It is essential to keep in mind that the context of use is key for ethical decision making when leveraging the use of AI for learning, teaching and assessment.

Key requirements for ethical use of AI in educational contexts

The AI Act sets out legally binding requirements for AI systems and obligations for the operators (including providers and deployers). For schools and teachers, this provides important clarity on what is legally required in everyday practice. Once the AI Act enters fully into force, educational institutions, when identified as users of high-risk AI tools, will be able to rely on the provider's conformity assessment, while also meeting their own eventual responsibilities as deployer under the regulation.

Irrespective of whether an AI tool falls within the scope of the legal framework (particularly in high-risk cases) developers and providers are strongly encouraged to embed ethical principles for trustworthy AI into the design and development of their systems. The same applies to educational institutions that procure and implement such tools. It is equally important that schools and educators are aware of these requirements and are able to ask informed questions throughout the planning, deployment, and evaluation of AI in their school context.

Guiding questions for educators and school leaders

When used appropriately, AI tools can bring value by enhancing teaching, learning and assessment as well as improving efficiency and supporting inclusion. However, their impact depends on the context, level of autonomy, and how they interact with human judgement. Educators and school leaders must consider not only how a tool is to be used, but also the potential level of risk it represents based on its intended function and impact on learners.

When considering the use of an AI tool, while it may not be necessary to understand how the AI tool works, it is important that the school or educator is able to formulate some relevant questions and engage in a constructive dialogue with the AI tools providers or with the responsible public bodies (such as education ministries, regional and local education authorities and school authorities).

The guiding questions can be used in different ways when reviewing an AI tool prior to it being set up in a school or while it is being

used. The questions can be asked of the educators themselves, of those making the decision at management level. The questions can also inform discussion with learners, parents and the wider school community. They offer key requirements for trustworthy AI tools and serve to enable constructive dialogue on their ethical use in education and training, while also considering their impact on the learning process (e.g. academic integrity, development of critical thinking).



Human agency and oversight

Including fundamental rights, children's rights, human agency, and human oversight.

For teachers	For the school
Do I know what to review in the outputs from the AI tool and how to check them before using them in my teaching?	What educational function does the AI technology/tool serve (e.g. recommendation, assessment, prediction, content creation)?
Can I review and adjust what the AI tool proposes before a student uses it, and intervene if I observe any unexpected or inappropriate effects during use?	Has the school provided teachers with professional development on the use of AI-supported tools in educational contexts?
Can I detect if the AI has made a mistake or an inappropriate suggestion?	Has the AI tool been audited for reliability in your context?
Does the AI tool support my decision-making , and can I verify its suggestions based on my professional judgement?	Who is responsible for reviewing and validating AI outputs?
Do I encourage students to think critically about AI outputs and help them to reflect on why the AI made a particular suggestion or decision?	Is there a school policy on the use of AI supported tools in schoolwork, and can educators override or intervene in AI-generated decisions?
If students feel uncomfortable with AI suggestions, do I allow discussion ?	Are students and parents informed about the role of AI in supported activities and decision-making, and do they have the opportunity to raise concerns or opt out when appropriate?

Transparency and explainability

Including traceability, explainability and communication.

For teachers	For the school
Do I understand why the AI tool makes certain recommendations or suggests specific activities for students?	Has the provider supplied clear documentation on how the AI tool works , including its decision logic, intended use in education, and treatment of intellectual property in training data and user inputs?
Can I see clear examples of how decisions are made within the system (e.g. why one student receives a particular activity and another does not)?	Does the school evaluate whether AI tools behave differently across student groups and document any emerging equity gaps?
Do the AI's suggestions make pedagogical sense in the context of my lesson planning and align with the curriculum?	Are there clearly defined responsibilities for addressing cases where AI outputs are opaque or difficult to interpret?
Are the system's messages explained in a clear and accessible way for both me and my students?	Does the school have a policy to regularly review whether AI-supported practices are understandable and accepted by the teachers, students and parents?
Do I require students to disclose how they have used AI , and can I provide examples of how to properly cite or acknowledge AI assistance in their work?	Are there procedures to explain AI-supported decisions in a comprehensive, non-technical way to teachers, students, and parents?

Diversity and inclusion

Including accessibility, universal design and stakeholder participation.

For teachers	For the school
Does my use of the AI tool meet the diverse needs of my students , and, if not, can I adapt the task or provide inclusive alternatives?	Is the AI tool designed to treat learners respectfully adapting to their individual needs?
Have I reviewed the AI tool's outputs for cultural or social bias , and do I prompt students to recognise and question any bias they notice?	Are different languages, cultural contexts, genders, and abilities adequately represented in AI-assisted learning materials?
Do I check with students, at a level appropriate to their age, whether the AI tool feels relevant, inclusive, and respectful of their identities, backgrounds, and learning preferences?	How are diverse student voices incorporated into the evaluation and improvement of AI tools?
Am I ensuring students who lack access to the tool outside school are not disadvantaged (e.g. by offering offline or alternative ways to complete the work)?	How does the school address digital-literacy gaps that may prevent some students from fully using AI tools?
If the tool offers feedback or support, does it accommodate different languages, reading levels, and accessibility needs , or do I need to supplement it with more inclusive resources?	Is there an option for low-bandwidth or offline access , and are alternative resources provided for students without reliable connectivity at home?

Fairness and non-discrimination

Including the avoidance of unfair bias, regardless of age, gender, abilities, or any other historical disadvantaged attributes or characteristics.

For teachers	For the school
Do I believe the AI tool adapts to individual needs (e.g. learning difficulties or disabilities) to support learning for everyone, not just to prevent students from falling behind?	Has the school ensured the AI tool has been tested for bias across different learner groups before adoption?
Can I verify that the AI tool takes students' age and comprehension level into account?	Are teachers encouraged and supported to report any instances where AI appears to misrepresent, stereotype, or exclude particular student groups?
Do I notice any outputs from the AI tool that misrepresent, exclude, or negatively portray particular groups?	Does the system take students' age and comprehension level into account ?
Can I assess whether the AI tool affects different student populations in equitable ways , particularly those who are already marginalised?	Has the school ensured that the AI tool's use aligns with legal obligations regarding non-discrimination ?
Can I easily intervene if I notice the system behaves unfairly or inappropriately toward a student or student cohort?	Does the school have clear procedures to respond if bias or unfair treatment of particular learner groups is identified after adoption?

Societal and environmental wellbeing

Including sustainability, social responsibility, democracy, and psychosocial wellbeing.

For teachers	For the school
Have I noticed whether the AI use affects my students' motivation or mood in any way (e.g. cause anxiety, disinterest, or dependence)?	Does the school evaluate how the use of AI tools may affect students' social interaction, emotional wellbeing, or sense of belonging ?
What boundaries can I set around AI use to maintain meaningful human interaction and prevent behaviours that undermine learning or student wellbeing?	Are teachers and students given opportunities to express concerns about how AI tools affect learning dynamics or classroom climate?
Have I discussed the use of AI in the classroom with the families of my students?	Does the school consider the environmental and social impact of AI tools when selecting or using them?
Do I have information about the environmental and social impact of the AI tool , and have I discussed alternatives or use cases with students to minimise negative impacts?	Has the school implemented any policies or awareness campaigns related to the environmental and social impact of digital tools, including AI?
How can the AI tool be used to help students develop skills for contributing positively to society ?	Do curricula or school programmes include opportunities for students to use AI to address real-world societal or environmental issues ?
Can the AI tool support students in exploring and understanding complex societal or environmental challenges ?	Are students encouraged to reflect on ethical, social, and environmental dimensions of AI , as part of their education for responsible digital citizenship?

Privacy and data governance

Including respect for privacy, quality and integrity of data, and access to data.

For teachers	For the school
Do I know what personal or learning data the AI tool collects about my students?	Has the school put in place measures to ensure that sensitive data is anonymised and only accessible to authorised staff ?
Have I explained to my students how their data will be used and stored when using the AI tool?	Are learners and educators clearly informed about how their data is collected, used, stored, and for what purposes ?
Do I avoid inputting sensitive or personally identifiable information into AI tools, in line with the school's privacy rules?	Is learner data stored securely and used solely for its intended educational purpose ?
Can I adjust the AI tool's privacy settings to suit the needs of my classroom?	Can the school customise or restrict the AI tool privacy settings to better protect student data?
Do I know who to contact if I notice a privacy or data protection issue with an AI tool?	Is there a clear process for reporting and receiving support on data protection concerns?
Can I provide an alternative for students or families who are uncomfortable with how data is collected or used?	Can the school confirm that all AI tools used comply with GDPR, the AI Act, and national data protection laws ?

Technical robustness and safety

Including resilience to attack, cybersecurity, general safety, accuracy, reliability, and reproducibility.

For teachers	For the school
Does the AI tool function reliably in the classroom , or do I notice frequent errors, crashes, or disconnections?	Has the school verified that the AI tool has been tested to ensure it works reliably before use?
Do the AI generated responses or suggestions seem appropriate , or do they sometimes appear incorrect or out of place?	Does the school regularly review AI tools to ensure they are functioning as intended and in line with educational goals?
Am I aware of the school's data protection policy and the steps it sets out for responding to a data breach involving an AI tool?	Has the school set up a clear procedure for teachers and students to report faults and escalate concerns when needed?
Do I know how to report a suspected malfunction or technical concern with the AI tool?	Has the school established a formal procedure for reporting technical faults or unsafe outputs , and a response plan for system failures, including maintenance, backups, and student safeguarding?
Is there a clear process to monitor and review the AI tool's performance to reduce future technical problems?	Has the school confirmed that the AI tool complies with cybersecurity and data protection regulations , and that the vendor meets relevant standards (e.g. EU Cybersecurity Act, Cyber Resilience Act)?

Accountability

Including auditability, minimisation and reporting of negative impact, trade-offs, and redress.

For Teachers	For the School
Do I know what to do if the system suggests something that does not meet my students' needs ?	Does the school have a clear division of responsibilities for teachers, students, and other stakeholders in relation to the use of AI tools?
Do I have the opportunity and means to give feedback or suggest improvements to how the system is used?	Does the school have a clear organisational structure that defines who is responsible for support, maintenance, and follow-up when issues are reported?
Do I feel confident to act if the system does not work as expected or seems inappropriate for the classroom?	Does the school have an evaluation process to assess whether the AI tool aligns with key educational values, and to incorporate input from teachers and students?
Do I know who to contact if I need to report a concern or make a complaint about the use of the AI tool?	Does the school have a strategy for updating responsibilities and procedures as needs change or new accountability issues arise?

Implementing the guiding questions

These scenarios provide examples of how the guiding questions can inform how AI tools are used in an ethical and responsible way. While all the guiding questions can be considered for each case, five questions are highlighted as examples based on their relevance to the proposed AI solution in response to a given objective. If

the answer to a question is 'no', this does not necessarily block the use of the tool. Instead, it signals that further action may be needed, such as seeking clarification from providers, consulting school management, or putting additional safeguards in place.

AI-assisted lesson planning

A resource teacher managing mixed ability Maths groups has started using an AI planning tool linked to the school's Learning Management System (LMS). Each week, the teacher uploads curriculum goals, learning objectives and recent observations on student performance.

The AI assistant produces group-specific outlines with objectives, practice tasks and relevant resources. The teacher reviews and adapts the plans before teaching.

The following guiding questions could be asked:

- Do I know what to review in the outputs from the AI tool and how to check them before using them in my teaching?
Human agency & oversight (Teacher)
- Do the AI's suggestions make pedagogical sense in the context of my lesson planning and align with the curriculum?
Transparency & explainability (Teacher)
- Do I understand why the AI tool makes certain recommendations or suggests specific activities for students?
Transparency & explainability (Teacher)
- Do I have the opportunity and means to give feedback or suggest improvements to how the system is used?
Accountability (Teacher)
- Has the school provided teachers with professional development on the use of AI-supported tools in educational contexts?
Human agency & oversight (School)



Supporting formative feedback



English teachers are experimenting with a large generative AI model for formative essay feedback. Students can receive annotated suggestions on structure, argument and evidence within minutes. Teachers are exploring how to use aggregated data to plan targeted review sessions with their students.

This approach offers the potential to provide students with quicker and deeper feedback and is freeing up time for teachers to focus on more targeted support for individual students.

The following guiding questions could be asked:

- Can I review and adjust what the AI tool proposes before a student uses it, and intervene if I observe any unexpected or inappropriate effects during use?
Human agency & oversight (Teacher)
- Do I notice any outputs from the AI tool that misrepresent, exclude, or negatively portray particular groups?
Fairness & non-discrimination (Teacher)
- Do the AI's suggestions make pedagogical sense in the context of my lesson planning and align with the curriculum?
Transparency & explainability (Teacher)
- Do I know what personal or learning data the AI tool collects about my students?
Privacy & data governance (Teacher)
- Do I feel confident to act if the system does not work as expected or seems inappropriate for the classroom?
Accountability (Teacher)

Using an AI-powered LMS to identify learning difficulties



A school is considering investing in a learning management system (LMS) that uses AI to analyse learning data and help identify early signs of learning difficulties. The platform tracks indicators such as vocabulary use, listening comprehension, problem-solving, and memory through class activities.

It flags potential issues that may not be immediately visible to teachers and provides differentiation suggestions for early interventions. Teachers use the insights to plan and provide targeted support to learners.

The following guiding questions could be asked:

- Do I know what to review in the outputs from the AI tool and how to check them before using them in my teaching?
Human agency & oversight (Teacher)
- Has the school provided teachers with professional development on the use of AI-supported tools in educational contexts?
Human agency & oversight (School)
- Can the school confirm that all AI tools used comply with GDPR, the AI Act, and national data protection laws?
Privacy & data governance (School)
- Does the school regularly review AI tools to ensure they are functioning as intended and in line with educational goals?
Technical robustness & safety (School)
- Before adopting the AI tool, has the school assessed whether it has been tested for bias across different learner groups, including younger children and those with additional needs?
Fairness & non-discrimination (School)

Using AI tools to support feedback on written assignments



A school is piloting the use of a generative AI tool to support assessment practices to help teachers score student essays and generate formative feedback. The system analyses grammar, structure, coherence, and content relevance. Teachers remain responsible for reviewing and editing the AI's suggestions so that human oversight is maintained. The feedback quality depends heavily on how prompts are written and how the tool was trained.

There are concerns about accuracy, bias, and whether student work should be uploaded to external platforms. The school is exploring both the potential benefits for reducing workload and the risks relating to data privacy and fairness.

The following guiding questions could be asked:

- Do the AI's suggestions make pedagogical sense in the context of my lesson planning and align with the curriculum?
Transparency & explainability (Teacher)
- Can I detect if the AI has made a mistake or an inappropriate suggestion?
Human agency & oversight (Teacher)
- Do I know what personal or learning data the AI tool collects about my students?
Privacy & data governance (Teacher)
- Can the school customise or restrict the AI tool privacy settings to better protect student data?
Privacy & data governance (School)
- Before adopting the AI tool, has the school assessed whether it has been tested for bias across different learner groups?
Fairness & non-discrimination (School)

Using a general-purpose LLM for student project work



A school is considering whether to allow students to use a general-purpose language model (LLM) to support assignments and projects. Teachers see potential for idea generation and improving writing but are concerned about over-reliance, fairness, and academic integrity.

The school is exploring how to set clear expectations for responsible and transparent use.

The following guiding questions could be asked:

- Do students understand how the AI model works, including its limitations, and are they encouraged to verify outputs?
Transparency & explainability (Teacher)
- Do I know what personal or learning data the AI tool collects about my students?
Privacy & data governance (Teacher)
- Has the school provided teachers with professional development on the use of AI-supported tools in educational contexts?
Human agency & oversight (School)
- Does the school evaluate whether AI tools behave differently across student groups, and whether their use risks reinforcing inequalities (e.g. access, digital literacy)?
Fairness & non-discrimination (School)
- Does the school have a clear division of responsibilities for teachers, students, and other stakeholders in relation to the use of AI tools?
Accountability (School)

Exploring AI-based tools for student guidance



A school has begun trialling an AI-based guidance tool to support students in exploring future study options. Learners create a profile including their interests and academic background.

The system uses natural language processing to match these with up-to-date course catalogues and suggests relevant higher education, further education, or training options. Guidance counsellors remain responsible for reviewing the recommendations with students and guiding their decision-making.

The following guiding questions could be asked:

- Can I review and adjust what the AI tool proposes before a student uses it, and intervene if I observe any unexpected or inappropriate effects during use?
Human agency & oversight (Teacher)
- Do I understand why the AI tool makes certain recommendations or suggests specific activities for students?
Transparency & explainability (Teacher)
- Are students and parents informed about the role of AI in supported activities and decision-making?
Human agency & oversight (School)
- Before adopting the AI tool, has the school assessed whether it has been tested for bias across different learner groups?
Fairness & non-discrimination (School)
- Does the school have a clear division of responsibilities for teachers, students, and other stakeholders in relation to the use of AI tools?
Accountability (School)

Supporting school budgeting and resource planning



A school has started using an AI tool to support annual budgeting decisions. Drawing on previous spending and enrolment data, the system suggests draft allocations across key areas like classroom materials, digital resources, and extracurricular activities.

School management can explore different scenarios using the tool, while retaining full control over final decisions.

The following guiding questions could be asked:

- Has the school verified that the AI tool has been tested to ensure it works reliably before use?
Technical robustness & safety (School)
- Does the school evaluate whether AI tools behave differently across student groups and document any emerging equity gaps?
Transparency & explainability (School)
- Can the school confirm that all AI tools used comply with GDPR, the AI Act, and national data protection laws?
Privacy & data governance (School)
- Does the school have a strategy for updating responsibilities and procedures as needs change or new accountability issues arise?
Accountability (School)
- Has the school implemented policies or awareness campaigns on the environmental and social impact of digital tools, including AI?
Societal & environmental wellbeing (School)

Using RAG enhanced AI to generate learning materials



A school is planning to introduce a generative AI tool enhanced with Retrieval Augmented Generation (RAG) to support the creation of classroom content (e.g. revision cards, presentation slides, worksheets, quizzes, reading passages, vocabulary lists). The tool will retrieve information from an indexed curriculum library and approved textbook content so that teachers can efficiently generate accurate, curriculum-aligned content.

The school aims to reduce planning time while improving the factual accuracy of student-facing resources. Teachers will remain responsible for reviewing all outputs before use.

The following guiding questions could be asked:

- Can I review and adjust what the AI tool proposes before a student uses it, and intervene if I observe any unexpected or inappropriate effects during use?
Human agency & oversight (Teacher)
- Do I understand why the AI tool makes certain recommendations or suggests specific activities for students?
Transparency & explainability (Teacher)
- Can I detect if the AI has made a mistake or an inappropriate suggestion?
Human agency & oversight (Teacher)
- Before adopting the AI tool, has the school assessed whether it has been tested for bias across different learner groups?
Fairness & non-discrimination (School)
- Does the school have a clear division of responsibilities for teachers, students, and other stakeholders in relation to the use of AI tools?
Accountability (School)

Using AI for student exploration and creativity



Teachers are considering how a generative AI assistant might support student exploration and creativity during inquiry-based learning and project work. The tool could be used by students to brainstorm ideas, explore diverse perspectives, and engage in reflective questioning about their progress.

Teachers are also considering how they themselves might use it to explore potential lesson ideas.

The following guiding questions could be asked:

- Do I know what to review in the outputs from the AI tool and how to check them before using them in my teaching?
Human agency & oversight (Teacher)
- Do I encourage students to think critically about AI outputs by prompting them to reflect on why the AI made a particular suggestion or decision?
Human agency & oversight (Teacher)
- Do I require students to disclose how they have used AI, and can I provide examples of how to properly cite or acknowledge AI assistance in their work?
Transparency & explainability (Teacher)
- Do I have the opportunity and means to give feedback or suggest improvements to how the system is used?
Accountability (Teacher)
- Does the school evaluate how the use of AI tools may affect students' social interaction, emotional wellbeing, or sense of belonging?
Societal & environmental wellbeing (School)

Automating administrative and communication tasks



A large school is trialling the use of AI-powered assistants to handle repetitive low-risk tasks. These include drafting emails to parents, summarising documents, translating school policies into multiple languages, and analysing survey data.

The school sees potential to reduce workload and improve consistency in communications.

The following guiding questions could be asked:

- Has the school evaluated whether the AI tools contribute positively to the school climate, including communication practices and administrative workflows?
Societal & environmental wellbeing (School)
- Has the school ensured that AI tools comply with data protection laws and that student and teacher data is not processed beyond what is necessary?
Privacy & data governance (School)
- Has the school defined clear expectations for how and when administrative AI tools should be used, and by whom?
Accountability (School)
- Has the school confirmed that the AI tool complies with cybersecurity and data protection regulations, and that the vendor meets relevant standards (e.g. EU Cybersecurity Act, Cyber Resilience Act)?
Technical robustness & safety (School)
- Does the school have a clear division of responsibilities for teachers, students, and other stakeholders in relation to the use of AI tools?
Accountability (School)

Using AI to summarise and synthesise digital education content



A group of teachers is evaluating the potential of AI tools that summarise long readings or synthesise content from multiple sources. The aim is to support students with managing information load during project work or exam preparation.

Teachers see value in helping students identify key points quickly, but they are also concerned about students not engaging with the content, superficial reading, or relying too much on summarised content.

The following guiding questions could be asked:

- Do I encourage students to think critically about AI outputs by prompting them to reflect on why the AI made a particular suggestion or decision?
Human agency & oversight (Teacher)
- Do students understand how the AI tool works, including its limitations, and are they encouraged to verify its outputs?
Transparency & explainability (Teacher)
- Before using an AI tool in my teaching, have I clearly defined my own role in reviewing or moderating its outputs?
Human agency & oversight (Teacher)
- Do the AI's suggestions make pedagogical sense in the context of my lesson planning and align with the curriculum?
Transparency & explainability (Teacher)
- Do I avoid inputting sensitive or personally identifiable information into AI tools unless it is safe to do so?
Privacy & data governance (Teacher)

Guidance for teachers and school leaders

AI can play a key role in enhancing teaching, learning and assessment practices for educators and learners. Whether it is at the system-wide, school or classroom level, it is important that careful consideration is given to the ethical use of AI and data systems. Here are a number of basic steps that educators and school leaders can take to review how AI and data is being, or can be used throughout the school, so that it leads to improved outcomes for all learners while being mindful of the ethical considerations.

Planning for an effective use of AI

When considering the use of AI and data, it is important that the school prepares and puts in place a collaborative and reflective process of internal school review. This requires educators to examine how they can use AI tools to positively support their teaching and student learning, and whether these tools align with pedagogical principles and educational goals. Predicting the consequences and the impact of the use of data and AI in education can be very difficult, and in some cases, it may not be feasible to disengage from certain systems once they become embedded in school processes. Therefore, an incremental approach to the development and deployment of these technologies and their assessment is needed. The idea is to gradually introduce these tools into their contexts and to continuously monitor potential societal effects, while remaining open to stepping back when unintended consequences occur. Ethical application of AI in education requires agency at the student, educator, school management and institutional level.

Review current AI tools and data use

The questions provided in these guidelines can be used as the starting point to inquire about the AI tools that are already in place, or as a basis for discussion if considering the future use of AI and data within a school. When carrying out a review, it is useful to list what data is being gathered by the school and clarify what purpose this serves. Schools should consider if there is less specific information that could be gathered to achieve the same outcome. They should also consider how long the data will be needed for and how the school might be able to retain it for as little time as possible. The European Union General Data Protection Regulation (GDPR) requires this kind of analysis.

Initiate AI and data policies and procedures

Before introducing AI tools, the school should establish clear policies and procedures that reflect legal obligations, such as those under the AI Act and GDPR, and provide guidance on how to consistently deal with issues when they arise.

These policies should guide how AI tools are selected, implemented, and monitored, and should establish consistent expectations for managing risks and responding to issues. Key measures may include:

- Conducting data protection and fundamental rights impact assessments.
- Ensuring public procurement of trustworthy and human-centric AI tools.
- Verifying that input data is relevant and appropriate to the intended educational purpose.
- Implementing mechanisms for meaningful human oversight.
- Monitoring the operation of AI tools and applying corrective measures where necessary.
- Ensuring staff receive appropriate training and support.

This will provide direction regarding what is appropriate as well as inappropriate or unacceptable behaviour and will help to ensure that people are treated fairly and equally. It is important that policies and procedures are communicated to educators, learners, and parents so that they understand what is expected of them.

Carry out a pilot of the AI tool

Before introducing new AI tools across the school, it can be useful to trial the system with a particular learner cohort. It is important to have a clear vision of what the school wants to achieve with the new technology so that an informed decision can be made involving students and their parents. Specific evaluation criteria are required so that an informed judgement can be made on the effectiveness of the AI tool in terms of improvement of learning outcomes, value for money and ethical use. This will also highlight some of the key questions that may need to be asked of the supplier before purchasing the system.

Collaborate with the AI tool provider

It is important to maintain contact with the AI tool provider prior to deployment and throughout the lifecycle of the AI tool. Look for clear technical documentation and seek clarification on any aspects that are unclear. A Service Level Agreement (SLA) should be agreed with the provider setting out the support and maintenance services and steps to be taken to address reported problems. Assurances should be sought from the provider regarding their compliance with applicable legal obligations. The ability to carry out these steps will depend on the school's level of autonomy, as in some systems procurement and contractual decisions are centrally managed. The school should also consider future dependence on the provider if, for example, it seeks to change provider in the future or move to a different AI tool altogether. It is also important that any human oversight measures identified by the provider and school/educational authorities (as deployer) are implemented while the AI tool is being used.

Monitor the operation of the AI tool and evaluate the risk

The use of the AI tool should be monitored on an ongoing basis to evaluate the impact on learning, teaching, and assessment practices. At school level it will be important to decide how monitoring will be organised and carried out, who will be responsible for monitoring and how progress will be determined and reported. The evidence gathered, as a result of ongoing monitoring, should inform and influence the future use of AI tools or the decision not to use them in particular circumstances.

Communicate with parents, learners and school community

Involving parents and learners in discussions and decision making will lead to better understanding and trust in what the school is aiming to achieve through the use of AI tools. Careful consideration needs to be given to explain what data is being collected, what is being done with the data, how and why it is being collected, and how

this is protected. It will be important to share these explanations with learners and parents and to provide opportunities for them to provide their feedback and voice possible concerns. Learners, depending on their age, might require different approaches in order to engage them so that they can participate in informed decision making.

The school should encourage learners to acknowledge when and how they use AI tools, particularly in assessment tasks.

Clear procedures, such as asking learners to indicate AI use in their submissions or providing examples of how AI contributions should be referenced, can support this. The school can put structures in place that promote transparency, support academic integrity, and make the role of AI in teaching, learning and assessment visible and appropriately understood.

Professional learning for responsible AI integration

As AI tools continue to evolve and data usage increases, it is very important to develop a better understanding of their impact on the world around us, including in education and training. Educators will need to remain informed of new innovations and developments through participation in continuing professional learning and involvement in communities of practice. School leaders will need to provide opportunities for staff to upskill and continue to develop competences for ethical use of AI and data.

The **European Digital Education Hub** is a collaborative platform that brings together experts, policymakers, and practitioners from across the EU. The Hub facilitates the exchange of knowledge and good practice, encourages cross-sector collaboration, and supports the implementation of the Digital Education Action Plan through peer learning and community engagement.

The **European School Education Platform and eTwinning** offer teachers and school leaders a space to explore and understand the opportunities and challenges of AI. Through collaborative projects, teachers can work with peers across Europe to design classroom activities, share practices, and engage students in learning with and about AI. The platform also provides access to professional development through webinars, online courses and resources.

SELFIE for Teachers is a free self-reflection tool developed by the European Commission that helps educators assess their digital competence, including how they use and integrate AI in teaching and learning. By responding to a series of questions, teachers can reflect on their current practices, strengths and areas for growth and receive personalised feedback to guide their professional development.

Interrelated Digital Education Guidelines

These guidelines form part of a broader suite of interconnected guidelines. These aim to support educators in responding to

the challenges and opportunities of digital transformation, with a particular focus on responsible and inclusive use of emerging technologies. In addition to the **Guidelines on the ethical use of artificial intelligence and data**, the suite includes:

- **Guidelines for teachers and educators on tackling disinformation and promoting digital literacy through education and training** aim to equip educators with strategies to help students critically evaluate digital content online and navigate complex information environments. The updated 2026 edition expands this support with practical materials, including guidance on generative AI and deepfakes.

- **Making informed choices on digital education content. EU guidelines for teachers and educators** (2025) provide direction on selecting and developing high-quality, accessible, and inclusive digital content. They include guidance on when and how to integrate AI into the creation, adaptation, and use of digital education content.
- **Guidelines on high-quality informatics education** (2026) focus on strengthening informatics as a foundational discipline in schools. They align with the wider goal of preparing learners to understand and engage meaningfully with AI, data science, and computational thinking.

Together, these guidelines are designed to primarily to support educators and schools in developing informed strategies and practices that address the ethical, pedagogical, and technical dimensions of digital education.



Considering AI literacy and digital skills

These guidelines support the use of trustworthy, transparent, and inclusive AI tools in education, in line with the DigComp Framework and the emerging AI Literacy Framework. They aim to empower learners, educators, and institutions across the EU to engage critically, confidently, and ethically with AI and other emerging digital technologies.

European Digital Competence Framework (DigComp)

The **European Digital Competence Framework** (DigComp) provides a common understanding to identify and describe the key areas of digital competence. As an EU-wide tool, it supports the design of initiatives and the planning of education and training programmes to strengthen digital skills across specific target groups. It describes the knowledge, skills and attitudes in five competence areas: information and data; communication and collaboration; content creation; safety; wellbeing and responsible use; and problem identification and solving.

DigComp 2.2 (2022) provides more than 250 examples of knowledge, skills and attitudes that help citizens engage confidently, critically, and safely with digital technologies, including new and emerging systems driven by AI. The fifth edition, **DigComp 3.0** (2025) builds on this work by systematically integrating AI competence into the framework. The updated framework addresses both the explicit and implicit relevance of AI, whether through direct interaction with AI systems, understanding how they operate, or engaging with their ethical and societal implications. It also recognises that AI literacy is closely linked to broader digital competence, given the growing presence of AI in everyday tools, platforms, and services.

The **DigCompEdu** and **DigComp** frameworks have been developed to apply these principles in education and outline the specific competences educators need and the organisational capacity schools require to integrate digital technologies, including AI, effectively and ethically. DigCompEdu is structured around six areas, including professional engagement, teaching and learning, and facilitating learners' digital competence. It can be used by teachers themselves and by those responsible for training and supporting educators, including in the effective use of AI tools and platforms.

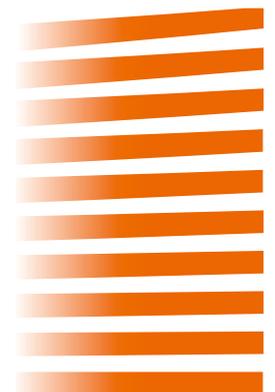
AI Literacy Framework

The **AI Literacy (AILit) Framework** for primary and secondary education is a joint initiative of the European Commission and the Organization for Economic Cooperation and Development (OECD).

The draft published in May 2025 outlines the essential knowledge, skills, and attitudes young people need to understand and interact with AI tools in a confident and critical manner. It also delves into ethical and broader societal implications. The framework offers 22 competences across four main domains:

- 🕒 **Engaging with AI** involves using AI as a tool to access new content, information, or recommendations.
- 🕒 **Creating with AI** consists of collaborating with an AI tool in a creative or problem-solving process.
- 🕒 **Managing AI** requires intentionally choosing how AI can support and enhance human work.
- 🕒 **Designing AI** empowers learners to understand how AI works and connect it to its social and ethical impacts by shaping how AI tools function.

The draft framework is designed to support educators, education and training institutions, and public authorities in helping learners develop these competences. The AI Literacy Framework will be finalised in 2026. Visit ailiteracyframework.org for further information.



Glossary

The words associated with AI and data use may sometimes sound unfamiliar or unclear. This glossary highlights technical terms that teachers and schools are likely to encounter when using AI, rather than pedagogical terms that could also apply to general digital tools. The glossary is organised into three columns: **What it means** (a plain-language definition of the term), **How it can apply to education** (examples of its use in school contexts), and **Why it's important** (the relevance for educators, learners, and school leaders, including potential benefits and risks to consider). The explanations provided here are written to be accessible to those working in schools and should not be considered full technical definitions.

What it means

How it can apply to education

Why it's important

ADAPTIVE LEARNING

Adaptive learning refers to AI-driven systems that personalise education by adjusting to the specific needs of individual learners. These systems modify content, pace, or delivery methods to enhance each learner's experience.

A primary school teacher might use an intelligent tutoring system that automatically directs learners to resources specific to their learning needs and levels.

Adaptive learning supports diverse classroom environments by offering each student a tailored learning path. AI plays a key role by analysing learner data in real time and adjusting instruction accordingly. The system can tailor educational experiences to each learner's unique needs, abilities and/or pace. This can lead to better engagement and understanding of the subject matter. However, this could also lead to students being held back from more challenging tasks if past performance is used as the sole basis for assigning their learning level.

AGENT

An **AI agent** is a system that can act on its own to carry out tasks, usually based on a goal or set of prompts from a user.

Unlike basic AI tools that respond to single inputs, agents can make decisions, sequence actions, and carry out workflows on behalf of a user or another system.

AI agents can be set up to support teachers and students to manage more complex tasks (e.g. organising learning resources, generating differentiated lesson plans, or helping students work through multi-step problems).

AI agents can range from simple chatbots to sophisticated systems that adapt entire curricula.

AI agents are becoming part of how educational tools operate behind the scenes, including automating tasks, making decisions, and managing workflows without constant input. These systems often require large amounts of data to function effectively, so it is important to understand what data is being used and how it is managed.

Understanding how AI agents function helps educators recognise when AI is acting independently and what informs its decisions.

What it means

How it can apply to education

Why it's important

AGI

AGI (Artificial General Intelligence) is a concept of AI which, if realised, would be capable of understanding, learning, and performing any cognitive task a human can, across all domains, with comparable flexibility. Although there is no single agreed definition, scientists generally distinguish between two main types: artificial narrow intelligence (ANI) and artificial general intelligence (AGI).

Unlike narrow AI, which is designed for specific tasks (e.g. correcting grammar, generating quizzes, or recommending content), AGI can have the ability to adapt to new situations without reprogramming or dedicated training.

AGI could be applied to education by enabling systems that understand and respond to students in a human-like way across all subjects and learning contexts. Acting as a responsive, always-available tutor, it could personalize instruction in real time, taking into account not only academic performance but also emotional and social cues.

For teachers, it could automate planning, assessment, and resource creation, while supporting inclusive practices by tailoring materials to diverse learners. These applications, however, remain theoretical, as AGI has not yet been developed.

AGI could offer new ways to support both teaching and learning by enabling more adaptable and responsive educational tools.

AGI would have a general understanding across disciplines, the ability to adapt to any learner in real time, and the capacity to respond to complex emotional and contextual signals, much like a human teacher.

ALGORITHM

An **algorithm** is a process or set of instructions to be followed in calculations or other problem-solving operations, especially by a computer.

AI algorithms can uncover patterns in students' performance and can help teachers optimise their teaching strategies/methodologies to personalise learning and better meet individual learning needs.

Algorithms can guide software to respond to specific classroom scenarios, such as recommending targeted resources or prompting interventions.

Algorithms can support teachers and students by automating repetitive tasks at scale, such as grading, tracking progress, or distributing learning materials. This can reduce workload and allow more time for meaningful interaction and instruction.

ALIGNMENT

AI alignment refers to the process of ensuring that an AI tool's goals, behaviours, and outputs are consistent with human values, intentions, or specified objectives.

It involves designing models that reliably do what humans want them to do, even in complex or novel situations.

AI alignment can help ensure that educational technologies, such as adaptive learning tools, assessment systems, feedback generators, and curriculum recommenders, are guided by instructional goals and curriculum standards.

It helps keep AI-driven decisions focused on learning quality, relevance, and fairness, rather than defaulting to metrics like engagement time or content popularity.

AI alignment in education involves designing tools that reflect educational intent through carefully selected objectives, training data, and system behaviour.

Proper alignment helps maintain educational quality, fairness, and human oversight.

Misalignment can lead to unfair outcomes, shallow learning, or loss of trust.

AUTOMATION

Automation refers to the use of computer systems to carry out tasks that would typically require human input. A system capable of operating without continuous human supervision is considered autonomous.

In schools, automation can support administrative and logistical functions.

Software tools can be used to handle repetitive and time-consuming tasks such as scheduling, attendance tracking, enrolment, and reporting.

By automating repetitive processes, schools can free up time for teachers and administrators to focus on student learning and support.

This can help improve efficiency and allows more attention to be directed toward educational goals and classroom engagement.

What it means

How it can apply to education

Why it's important

BIAS

Bias is an inclination or prejudice for or against a person, group, or perspective, which can affect fairness and accuracy.

In AI tools, bias can emerge from how data are collected, how models are trained, or how rules are designed. It may be unintentional and not directly linked to human prejudice, but rather to limitations in the data or context in which a system operates.

Bias in AI can affect educational tools and decision-making processes. For example, algorithms trained on biased data may make inaccurate predictions about student performance or recommend content in ways that reinforce inequality (e.g. favouring certain genders, cultures, or socioeconomic backgrounds).

Bias can distort outcomes and reinforce existing inequities. In certain cases, bias can result in discriminatory and/or unfair outcomes (i.e. unfair bias).

Recognising and addressing bias in AI is essential to ensure fairness, accuracy, and inclusivity in education.

AI tools used in schools (e.g. for assessment, feedback, or resource allocation) need to be monitored for unintended bias that could disadvantage certain student groups.

Educators and developers need to be aware of how data, design decisions, and context affect AI behaviour, and apply appropriate checks to reduce the risk of unfair outcomes.

CHATBOT

A **chatbot** is an AI-powered software program that interacts with users through text or voice in a way that simulates human conversation.

It is often used to answer questions, provide information, or guide users through specific tasks in a conversational format.

Chatbots can act as virtual advisors that support learners by answering routine questions, offering explanations, and adapting responses based on individual learning pace, on a 24/7 basis.

They can also help identify areas where a student may be struggling by analysing interaction patterns.

The reliability of AI chatbots depends on how they are designed and the data they are trained on. Without careful alignment to curriculum goals or safeguards to ensure factual accuracy, chatbots may generate responses that are misleading or inconsistent.

Understanding their capabilities and limitations is essential when integrating them into educational settings.

DATA

Data are coded representations of information, often encoded in a format that can be processed by computers. These can be organised into datasets and stored systematically as a database. Large-scale data (**big data**) are essential for training and improving AI tools.

Each data point can include **metadata**, which provides contextual details such as origin, type, or timestamp, supporting transparency and traceability in data use.

Training data are used to teach AI models to identify patterns, make predictions, or generate responses. The quality and representativeness of this data can significantly affect how AI tools perform.

Personal data refer to information that can identify individuals and must be handled with care to ensure compliance with ethical and legal standards.

Trace data, generated through user activity such as clicks, time spent on tasks, or quiz attempts, are increasingly used in educational AI to monitor engagement and adapt responses in real time.

In education, data are used to support teaching, learning, and decision-making at multiple levels.

Adaptive learning systems use training data to adjust content and pacing based on individual student progress. Trace data, such as quiz responses or time spent on tasks, provide real-time insights that help identify learning needs and prompt timely support.

Metadata makes digital resources easier to organise and retrieve across platforms, improving the usability of learning content. Personal and institutional data also inform curriculum planning, assessment design, and targeted interventions.

Data play a central role in developing and refining AI tools used in education.

Because educational data often include personal and sensitive information, strong protections are needed to ensure student privacy. This includes how data are collected, stored, accessed, and shared.

Increased use of trace data also raises questions about long-term data use, informed consent, and the extent to which student activity should be monitored.

What it means

How it can apply to education

Why it's important

DEEPFAKE

Deepfake means AI-generated or manipulated images, audio or video content that resembles existing persons, objects, places, entities or events and would falsely appear to a person to be authentic or truthful.

Deepfakes can be used for positive purposes such as simulations or historical re-enactments.

However, they pose risks such as the spread of misinformation, manipulation of academic content, or identity misuse.

Deepfakes highlight the need for critical digital literacy in schools.

As AI-generated content becomes more realistic and widespread, particularly across social media platforms, the ability to question sources, verify authenticity, and understand how such content is created is essential.

These skills help protect against misinformation and support responsible media use.

DEEP LEARNING

Deep learning is a type of machine learning that uses artificial neural networks to process large amounts of data and detect complex patterns. These techniques are widely used in AI tools for tasks such as image recognition, speech processing, and natural language understanding.

Deep learning models can analyse large datasets to detect subtle patterns in student behaviour and performance.

These insights can support the development of personalised learning strategies, adaptive feedback, and early intervention systems tailored to individual learners.

Understanding how deep learning works can help educators and students critically engage with AI-based tools used in the classroom. It also highlights the importance of data quality and the potential for bias in model predictions.

As these systems are often complex, developing awareness around their capabilities and limitations is essential for informed, ethical use in education.

GENERATIVE AI

Generative AI (GenAI) refers to AI systems that can generate content from general instructions (e.g. text, images, audio, video, code), process existing content (e.g. translate, correct), or analyse data (e.g. sort, summarise) based on patterns learned from existing data.

These systems generate outputs in response to user instructions, known as prompts, and rely on models trained to predict and produce relevant information.

GenAI can help teachers generate educational content such as lesson plans, quizzes, rubrics and study guides, while students can use it for practice, revision, or idea generation.

However, it requires a human-centred approach to review and interpret outputs, especially to address concerns such as bias, misinformation, or inaccuracies.

Students and teachers increasingly interact with GenAI platforms through natural language, without needing technical skills or coding knowledge. This shift has expanded access and ease of use but also increases the need for critical awareness.

GenAI can save time and enhance productivity, yet its outputs must be evaluated carefully to ensure they are accurate, fair, and educationally appropriate.

What it means

How it can apply to education

Why it's important

GPT

A **Generative Pre-trained Transformer (GPT)** is an AI model designed to generate human-like text by drawing on patterns it has learned from large volumes of text data.

Generative means the model can create new content. **Pre-trained** refers to the extensive initial training phase with massive datasets of text from the internet (books, articles, websites, etc.). **Transformer** describes the model architecture that enables GPT to analyse the relationships between all words in a sentence or prompt.

GPT models are increasingly being used in education to support a wide range of tasks.

Teachers are using them to draft lesson materials, generate quizzes, and adapt texts for different learning levels.

Students are engaging with GPT models to practise writing, summarise content, generate and explore ideas, and receive real-time feedback.

As AI models become more widely used in education, it raises important questions about how students use and reference AI-generated content, especially in assessments.

This has led to debate about how students use GPT responsibly, when and how its contributions should be acknowledged, and how to ensure that assessment work reflects their own understanding rather than relying solely on AI-generated responses.

HALLUCINATION

Hallucination in large language models (LLMs) refers to the generation of responses that appear coherent and well-formed, but are not grounded in factual information. These outputs can include inaccuracies or entirely fabricated content, especially when the model responds to ambiguous or open-ended prompts.

Since LLMs rely on statistical patterns learned during training and do not fact-check, they may present invented information with high confidence.

Hallucinations present a risk in education where factual accuracy matters. However, they also provide a practical entry point for exploring how language models operate.

Discussing hallucinations can help students develop AI literacy by understanding that outputs are generated from patterns, not facts, and by learning to question and verify information produced by AI tools.

To use AI tools effectively, students need to be AI literate to evaluate the reliability of outputs. Without this foundation, they may misinterpret or accept misinformation.

Hallucinations underscore the need for critical thinking—questioning, verifying, and reflecting on information—so that learners engage with AI responsibly rather than accepting its responses at face value.

LEARNING ANALYTICS

Learning analytics involves the measurement, collection, analysis, and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs.

Increasingly, AI plays a role in analysing these data sets to enable faster and more detailed insights.

Learning management systems record data on student interaction with course materials, their interaction with teachers and other peers, and how they perform on digital assessments.

AI-driven learning analytics process this information to detect patterns, flag potential issues, and personalise the learning experience through targeted recommendations or feedback.

While these tools offer powerful insights, they also raise questions about data privacy, consent, and the interpretation of automated feedback.

Understanding how AI contributes to learning analytics is essential to applying it ethically and ensuring decisions support meaningful learning outcomes.

What it means

How it can apply to education

Why it's important

LARGE LANGUAGE MODEL

A **Large Language Model (LLM)** is an AI tool trained on vast amounts of text data—from books, articles, websites, and more—to understand and generate human-like text. It can perform a wide range of language-based tasks such as writing essays, answering questions, summarising texts, translating languages, coding, and generating ideas.

LLMs are already being widely used by students, teachers, and parents for writing assistance, language learning, content generation, and study support.

Their ability to engage through natural language makes them accessible to students and teachers without technical training.

LLMs have made AI more accessible to the public, including learners, by allowing interaction in everyday language. This has prompted schools to reconsider traditional approaches to writing tasks, feedback, assessment, and independent learning. As LLMs become embedded in commonly used platforms, educators and students need to engage with them critically, ethically, and in ways that support meaningful learning.

MACHINE LEARNING

Machine learning is a branch of AI that enables computer systems to identify patterns, make predictions, and adapt over time using large sets of data without being explicitly programmed.

The system statistically “learns” from experience and adjusts its outputs as new data are introduced.

Machine learning is used to support personalised learning by tailoring content, pace, and feedback to each student.

Learners are guided through their own learning, can follow the pace they want, and make their own decisions about what to learn based on system prompts.

Machine learning underpins many AI applications already used in schools (e.g. adaptive learning platforms, automated feedback and content recommendations).

This raises questions about data quality, transparency, and the need to understand how decisions are being made, especially when they influence student learning outcomes.

NATURAL LANGUAGE PROCESSING

Natural Language Processing (NLP) is a branch of AI that enables computers to understand, interpret, and respond to human language in spoken or written form.

It powers many systems that allow users to interact with technology using everyday language rather than programming commands.

NLP is used in tools such as virtual tutors, reading assistants, and conversational AI platforms.

These systems can provide real-time feedback on pronunciation, grammar, and comprehension, support students with personalised reading recommendations, and engage in verbal or written dialogue to support learning.

NLP is the foundation behind many common applications (e.g. chatbots, voice assistants, and text analysis tools) that are now part of the educational landscape.

As these systems continue to improve, they are likely to play an even greater role in personalised learning, language development, and classroom communication.

NEURAL NETWORK

A **Neural network** is a type of AI tool made up of layers of interconnected nodes, modelled loosely on how neurons work in the human brain.

These networks process information by transmitting signals between nodes, allowing the system to detect patterns, make decisions, or generate outputs.

Neural networks can be trained to support various educational applications, such as recognising handwriting, predicting student performance, or powering speech recognition tools.

Through repeated exposure to data, the system “learns” to improve its accuracy over time, mimicking how learners improve through practice.

Neural networks are the foundation of many AI tools used in schools today, including those that support personalised learning, automated feedback, and natural language processing.

Awareness of how they work helps educators and students appreciate the complexity behind AI tools and make informed decisions about how to use them.

What it means

How it can apply to education

Why it's important

PREDICTIVE ANALYTICS

Predictive analytics involves using statistical methods and machine learning algorithms to analyse current and historical data to make informed predictions about future outcomes. It is commonly used in AI tools to anticipate patterns, behaviours, or risks.

Predictive analytics can help identify students who may need additional support, based not only on past performance but also on projected future outcomes.

These tools can inform interventions by highlighting students at risk of disengagement, falling behind, or not meeting key milestones.

Predicting students' future needs allows schools to offer timely, targeted support, and reduce the risk of early dropout or academic underperformance.

It is important that these systems are used responsibly, and mechanisms are in place to ensure that predictions support, rather than replace, professional judgment.

PROMPT

(Prompt engineering, system prompt, AI conditioning)

A **prompt** is the input given to an AI tool—such as a question, instruction, or command—to generate a specific output (e.g. "Write a 500-word story about an adventurous cat and an ant in the school garden").

Clear, purposeful prompts help guide the AI's response toward the intended result. Effective prompts often include a role, a goal, relevant context, and any constraints.

Prompts are central to how students and teachers interact with generative AI. Crafting prompts encourages students to clarify their ideas, refine their goals, and express themselves with precision.

This process supports critical thinking, improves communication skills, and deepens subject understanding.

Prompts shape the quality and relevance of AI responses. The emerging practice of *prompt engineering* (designing precise, effective prompts) is becoming a key skill for using generative AI in learning environments.

Mastering prompt design helps reduce inaccuracies, improves alignment with educational goals, and enables users to get more useful, accurate, and meaningful outputs from AI tools.

RETRIEVAL AUGMENTED GENERATION

Retrieval Augmented Generation (RAG) works with Large Language Models (LLMs) to improve the accuracy and relevance of their outputs.

RAG works by retrieving information from an external knowledge source (e.g. a document database, website, or curriculum library) at the time of prompting.

This allows the AI to supplement the data it trained on (which may be outdated) with current, verified, and domain-specific content.

RAG may be used to make AI-powered education tools more accurate, reliable, and relevant to specific learning contexts.

It can support adaptive tutoring systems by drawing from school textbooks, academic articles, or lecture notes to provide tailored, accurate answers.

For both teachers and students, RAG enables more context-aware interactions with AI which can improve the relevance of generated content.

RAG aims to reduce the tendency of LLMs to generate plausible but inaccurate information (hallucinations).

RAG makes AI responses more fact-based and trustworthy without the need to retrain the entire model.

This has significant implications for education, where factual accuracy, relevance, and reliability are essential for effective learning and teaching.

What it means

How it can apply to education

Why it's important

SMALL LANGUAGE MODEL

A **Small Language Model (SLM)** is an AI tool trained on a smaller, more focused dataset and typically designed for specialised tasks within a specific domain. While SLMs are less flexible than LLMs, they require less computational power and may offer greater efficiency, control, and privacy in targeted educational settings.

SLMs may be embedded within classroom technologies to perform specific functions such as marking short responses, generating subject-specific prompts, or supporting curriculum-aligned tasks. Their compact size makes them suitable for offline use or integration into local school systems with defined constraints.

As AI use expands in and beyond the classroom, understanding the difference between large and small models helps schools make informed decisions about tool selection, data governance, sustainability, and educational impact. SLMs may offer advantages in terms of cost, control, and data protection—especially when aligned with local needs and regulatory requirements.

SUPERVISED LEARNING

Supervised learning is a machine learning technique in which an algorithm is trained on a labelled dataset, where each input is paired with a known output or target. The system learns to make predictions by comparing its results to the correct answers.

Unsupervised learning involves training an algorithm on data without predefined labels. The system identifies patterns or structures within the data on its own, using these insights to inform its learning.

Supervised learning is used in AI tools that support tasks like predicting student performance, identifying learners at risk of falling behind, and personalising feedback. It can also assist with automated grading or recommendation systems aligned to learning objectives.

Unsupervised learning can be used for discovering patterns across large, complex educational datasets (e.g. identifying clusters of students based on learning behaviours, demographics, or engagement trends). These insights can help tailor interventions more effectively without predefined categories or outcomes.

Knowing how AI tools have been trained—whether through labelled or unlabelled data—helps teachers better understand how those systems work and what their outputs really mean.

If an AI tool has been trained on certain types of student data, it may reflect the patterns in that data but also carry over any gaps or biases. This matters when AI is used to predict student performance, group learners, or personalise content.

TOKEN

A **token** is a unit of text (e.g. a word, part of a word, or punctuation mark) that an AI language model reads and processes.

AI tools do not see whole sentences the way we do; they work with tokens, one at a time. There is a limit to how many tokens an AI can handle at once (called a *context window*).

If the input gets too long, the model starts ignoring the earlier parts. Some tools also attempt to detect AI-generated text by analysing token patterns, though this approach has limitations.

Understanding how tokens work helps students and teachers see how AI builds its answers. In class, students can try changing a word or phrase in their prompt and see how that affects the output.

They can also experiment with temperature settings (which control how random or creative the AI's responses are) to explore how much the response changes. This can help students understand the mechanics behind AI writing and encourage careful, thoughtful interaction with the tool.

Knowing how AI uses tokens shows that it generates text based on patterns, not understanding. This helps explain why AI sometimes gives wrong or odd answers, as it is focussed on predicting what comes next, not checking facts.

It also helps teachers and students think more carefully about how to ask good questions and write clear prompts to get useful results.

It is important to consider that tools claiming to detect AI-generated text are not always reliable, since both humans and AI can produce similar patterns of language.

Further information

Keeping up to date with AI trends, technologies, applications, and regulations will be more important than ever. There is a growing range of resources available to help you keep up with new innovations and research that is relevant to educators. Here are a selected number of references:

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