UNDERSTANDING AI FOR SCHOOL
TIPS FOR SCHOOL LEADERS

Artificial Intelligence is having a major impact on education. Whether you are excited or concerned about AI, as a school leader you have a responsibility to ensure AI is approached thoughtfully and appropriately in your school community and informs your vision for teaching and learning. This guide will help you gain the background you need as a learning leader in an AI infused world.

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What is AI?

To begin, it is important to have a basic understanding of what AI is (and what it isn't). Artificial Intelligence, or AI, is a branch of computer science aimed at creating machines that mimic human intelligence. It's used to perform tasks that usually require human thought, like understanding language, recognizing patterns, or making decisions. Types of AI range from systems doing specific tasks, like recommending movies or autocorrecting typing, errors to more advanced forms that can generate new content or predict future outcomes. AI is also part of the technology behind self-driving cars and digital assistants, like Siri or Alexa. Essentially, AI allows machines to learn, adapt and perform tasks like humans, often more quickly and accurately. It's a rapidly evolving technology that's already a part of our everyday lives.

Reactive

Tools that respond to specific inputs or situations without learning from past experiences (e.g. Alexa, Roomba, chess-playing computer).

Predictive

Tools that analyze historical data and experiences to predict future events or behaviour (e.g. Netflix, credit-scoring systems).

Generative

Tools that generate new content or outputs, often creating something novel from learned patterns (e.g. ChatGPT, Stable Diffusion, Midjourney).

Generative AI, which encompasses ChatGPT and the other new content-creation tools, is the type that is getting the most attention recently. As such, this guide will focus primarily on generative AI, although all types of AI have implications for education and are worth understanding in greater detail.

How Generative AI works

You have probably seen predictive text when using your mobile phone. It suggests options for the next word based on the one or two that you've just written, using its internal knowledge of which words are likely to follow others. One way of thinking about Generative AI text systems (like ChatGPT, Bard, etc.) is that they are doing something similar, except in a much more sophisticated way, taking into account thousands of words that have just been written and predicting the next ones. They base their predictions on thousands of web pages, books and other documents that they've been trained on, so what they produce will be based on ideas from this data set. They are called Large Language Models, or LLMs.

But, in the same way predictive text offers multiple options about the next possible word, generative AI systems know there are hundreds of potential next words, ranging from very common to very unlikely. Most generative AI systems have some variability built in that means they choose different plausible options each time, so that they won't answer the same thing in the same way twice.

Other generative systems work with images, such as MidJourney, or DALLE-2. They have been trained on many thousands of images and their descriptions, so that they can start predicting possible images based

on text descriptions. Some can work the other way, taking the image and predicting what the text description could be. Others work with audio, video, or even a mix of text, audio, video and more - these are called multimodal.

While these tools are impressive, they have their limitations and their output is dependent on the quality and diversity of the data they were trained on as well as the skills and knowledge of the human prompting the input. Biased, confusing or false training data will likely lead to biases and errors being reproduced by the AI.

What AI is *Not*

From this description, you can see that AI is not magic, nor mysterious. The more we seek to understand the concepts behind AI, the better we will be able to use it for constructive purposes in education. It's also important to remember that AI is not human intelligence; it does not possess emotions, consciousness, or inherent ethical judgement. It is not 'thinking' in the same way a human does, it is just mimicking human writing based on a large base of learning and some clever algorithms and statistics. This is also why we see some strange outputs, answers and images: the system is merely generating a reasonably plausible output, based on its training data, for any prompt. Most systems have no built-in checks to see if that output is actually true, if its suggestions are possible or if its images are realistic.

Guiding Principles for Learning Leaders

This guide will give you some practical ideas for starting to think about AI in your school or setting, but it's important to understand that this is neither an easy area nor an area that you can ignore. Here are some guiding principles to support you as you navigate toward purposeful uses of AI in your school or setting.

AI is here, and is probably already being used by your students.

A survey in June 2023 suggested that 67% of UK secondary students had already used chatbots (such as ChatGPT) to do homework for them. 66% of teachers surveyed suggested that they felt they were now regularly receiving homework completed using AI. This means every school and every teacher needs to think about how to change and adapt homework and coursework assignments.

It's not possible to reliably detect whether AI was used by students.

Despite early suggestions that tools could help teachers identify what was written by tools like ChatGPT, further studies have proven these completely unreliable and likely to be discriminatory against people where English is not their first language. It's also not possible to use the tools themselves to detect their own output: they will confidently give you an answer which is likely to be completely wrong.

It's not yet possible to predict the impact of AI on jobs and skills.

We're still at the beginning of the development of the technology and the only consensus about the impact of AI is that it will have one, but it's not yet possible to know exactly what - although that doesn't stop people making strong predictions. Take discussion in this area with a pinch of salt and don't make any knee jerk moves to significantly change curriculums just yet, although it could be helpful to consider how you're embedding digital citizenship and computational thinking to help your students navigate current and future technologies.

The situation is changing incredibly fast.

AI is not like other technologies or changes we've seen. ChatGPT would seem to be one of the fastest growing human-used product in human history. This has three key implications:

Advice will go out of date quickly.
This guide (written in 2023) could easily be out of date soon as the area is moving so fast. This is not an area you can learn about once and then ignore for a while - you need to monitor changes and that means connecting with trusted organizations who will share updates and help you make sense of this.

The topic will get more complex over time.
There will continue to be lots of new tools launched and new capabilities found over coming months. The longer you wait to start learning about the topic, the harder it will be to keep up with changes.

Developments will be superseded very quickly.
Building tools with fast-moving AI technology involves working out how to give current tools the right instructions and deal with the shortcomings. But overly-intensive work to develop AI tools right now could easily be out of date in a few months when new AI tools make the work redundant. This suggests that the best approach right now is some experimentation and ongoing learning rather than making huge investments or changes. For example: spending weeks on AI-proofing homework tasks now may only work with existing tools, but it's entirely possible that in 3-6 months, new tools make even the new homework tasks doable with AI. Similarly, spending a long time redeveloping lessons to include AI tools could also be out of date very rapidly.

This is a new and exciting area, but research evidence is not yet strong.

While the potential for AI to improve education, supporting students and teachers, seems to be very large, we don't yet know for sure how to use it very effectively nor how impactful it will be. It's always wise to exercise a level of caution here: time spent working on AI could mean less time spent on other evidence-based initiatives that have been shown to help pupils learn. It could be helpful to include board members or governors.

A Three-Pronged Approach to AI in your School or Setting

Based on what we know now, and the principles above, we recommend that school leaders take a three pronged approach:

Learn More

Prepare Staff

Explore Together

1. Learn More

One of the most important things you can do right now is to learn a bit more about Artificial Intelligence and try playing with some of the tools. There's a variety of courses, newsletters and discussion communities appearing, including:

▶ ISTE resources on AI in education: US-focused but still very relevant to UK schools

▶ AI 101 for Teachers - video series to introduce AI in education created by ISTE, code.org, Khan Academy, and ETS

▶ Teacher Development Trust blogs on AI - library of articles focused around AI and teacher development

▶ The Skinny on AI for Education - a newsletter by Professor Rose Luckin and the Educate Ventures Research team

▶ Generative AI in Education - a statement from England's Department for Education on the use of AI and Large Language Models.

▶ One Useful Thing Blog - Dr. Ethan Mollick's (UPENN) blog on AI including its use in education

▶ Teaching with AI - blog from OpenAI on ideas for teaching with ChatGPT

It could be helpful to set up a learning group, perhaps within your school or across a group of schools, including board members or governors. This could be anything from a messaging group where people share discussions and resources to a regular meeting to discuss topics over time. Also, do make sure that you are up to date with government guidance such as Keeping Children Safe in Education (2023).

2. Prepare Staff

AI can evoke strong feelings of excitement, fear and confusion. It's important to make a space for staff to discuss and learn. An important starting point is to involve teachers in exploring pros and cons, deciding what a school may want to use AI for. You could either use a slot within an existing staff meeting and/or you could arrange an optional additional meeting for teachers to come and discuss. Topics to discuss could include:

▶ How might we adapt homework tasks to take into consideration the availability of AI chatbots? Are there ways to ensure that students can still learn key knowledge and think hard themselves? Are there opportunities to actively encourage students to use AI tools to enhance their learning?

▶ How can we consider equality and inclusion around use of AI tools? What are potential issues around biases within the tools themselves? What about unequal access to technology to access the tools, or unequal access to support to use them? What about the reverse inequity: some students can only access AI support while others can get both AI support and human support?

➤ How could we potentially teach students about this new technology in order to use it well for good while understanding its limitations and risks? What are the implications of this for the way we learn about the technology ourselves?

➤ How could we potentially harness AI to help our own lesson preparation, our teaching and our own learning? How could we position the AI tools to assist us? What would be the risks of asking AI to plan lessons or create student resources without expert teacher review and input?
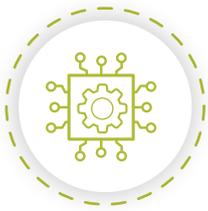
3. Explore Together

Alongside a space for discussion, it's useful for staff to have a chance to experience the capabilities and limitations of AI tools. As a school leader, you can encourage exploration of AI by staff in order to gain first-hand experience using the technology and to think about how it could be integrated into their work, rather than relying on hearsay or surface-level understanding.

It's important to foster a culture where teachers feel safe to experiment, make mistakes, and learn from them. This can be achieved by emphasizing that exploring AI is a learning process, and it's okay not to have all the answers immediately. Encourage interested staff to explore multiple AI apps, not just a single tool (see illustrative list of apps below).

Tip: Schools that have been successful often provide dedicated time — perhaps repurposing a faculty meeting — for staff to have undistracted time to explore AI tools.

Examples of Generative AI Tools to Explore

Note: we neither endorse nor validate these apps; they are provided as examples for exploration.

Chatbots (e.g. ChatGPT, Claude, Bing Chat, HeyPi, and Bard):

These tools generate human-like text based on the input they receive, capable of providing useful information or even engaging in a conversation.

Media Creation (e.g. MusicLM, DALL-E, Stable Diffusion, Firefly):

These tools generate images, audio, or video from descriptive prompts. Music and art can be generated to match existing artistic styles.

Learning Content (e.g. Khanmigo, Lessonplans.ai):

These are tools designed specifically to support learning needs. These can include creating lesson plans, whole courses, or serving as a coach for students or teachers.

Virtual Human Representations (e.g. Pictory, PlayHT):

These systems generate spoken language from written text, effectively creating new audio content or from text to video. Video can be generated to provide human-appearing mentors to share and summarize content.

You may wish to start exploring AI within the curriculum:

1. Foster Ethical AI Use and Digital Citizenship: — Within PSHE, Citizenship or Computing, how could you educate students about the ethical implications of AI, including biases, privacy concerns, and algorithmic fairness? How could you teach digital citizenship skills, emphasizing responsible and ethical use of AI technologies? How might you encourage critical thinking and awareness of the societal impact of AI systems?

2. Promote Computational Thinking: — Within maths, science and computing, how could you emphasize computational thinking skills, such as problem-solving, algorithmic thinking, and logical reasoning? Are there ways to start to integrate coding and programming activities to develop students' understanding of AI algorithms and models? Could you explore providing opportunities for students to analyze and interpret data using AI tools and technologies?

When exploring any of these technologies it is helpful to remember:

➤ Many generative AI tools are trained on datasets that are not tailored toward children and results may be unsuitable for some ages, so caution needs to be exercised in their use. The data they are trained on will have a range of human biases, so there is a risk that results could include anything from overt to subtle examples of racism, political biases, phobias or bigotry, cultural biases and more.

➤ AI tools will not necessarily explain ideas in the same order as an expert teacher, nor will they necessarily address misconceptions, sequence learning or use the right level of vocabulary as an expert teacher. The data they are trained on includes significant amounts of writing with misconceptions or outdated ideas about teaching, for example including ideas in their outputs about 'learning styles' or 'left-brain, right-brain' thinking when both have been fully debunked - you can't assume that pedagogical or curriculum advice, lessons plans nor resources will be aligned with latest research.

➤ There are significant questions about data privacy and intellectual property, with some tools taking everything entered into them to be used for further training of the AI and several ongoing court cases around the world with authors and artists taking action against AI companies for using their data for training the systems without permission. It is important to tread carefully here and be mindful of a fast-moving area in which many countries are still trying to work out how to legislate to catch up with the changes.

➤ With any educational setting, it is important to consider all stakeholders, including parents staff and students. Leaders should think about the messaging around AI they want to give to parents and the best way to communicate this. As is it likely parents will have varying amounts of knowledge on the matter of AI, providing information around what AI is and the limitations and benefits of using AI to support learning will be helpful. You may also want to point parents and carers to Childnet.com for helpful advice on online safety.

Frequently Asked Questions

As school leaders begin to discuss AI in schools, many questions may arise. Here are some of the common questions and some suggested answers:
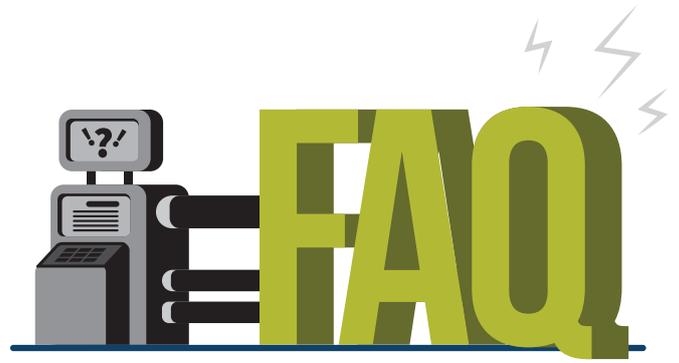
Q: Should we ban AI?

A: Blanket bans on technology tools are rarely a good idea. While schools are free to go for a 'no external mobile device' policy, this shouldn't mean no access to any form of device at any time. AI has become an integral part of our everyday lives and is becoming more prevalent in the workplace. By denying students access to these tools, we may inadvertently be limiting their future options. Students need to be digitally literate, not only to thrive in the workplace but to navigate the modern world confidently and safely. Also, remember that not all students have equal access to technology at home. By banning technology in school, we might widen the digital divide. In addition, the notion that we can 'ban AI' reveals a fundamental misconception of what AI is. It isn't a single website but an underlying technology that is already built into millions of websites (and likely soon to be built into every website to some degree).

Q: Are there specific AI tools and apps we should avoid?

A: Just like websites, there are some AI apps that will have more value than others. There may be specific websites that you choose to make unavailable in your schools based on the content or age appropriateness of the site. You might consider how inclusive and accessible a tool is, whether it is cost effective, how well it complies with your schools privacy and security policies, and whether its output has a clear, positive impact on your learning environment when determining which AI apps bring the most value to your teachers and students, and which do not. In addition, some AI apps are only available for use for students older than 13 years of age (this includes ChatGPT). Reading the terms of service on a particular AI app will help determine if there is an age restriction on a particular app. Others may not be developmentally appropriate for your students even if they do not have age restrictions.

Q: How do we stop cheating?

A: You should always start by raising awareness among students about the consequences of cheating and the importance of academic integrity. While AI creates new challenges for schools, ultimately it encourages us to think anew about how we assess learning. Essentially, you really only have two options: attempt to maintain current assessment approaches in a highly controlled, technology-free environment, or adapt your assessment methods. For example, consider designing assessments in which students need to show their thought process and discuss that back in class. Encourage open-ended questions, collaborative assignments and in-class activities that require active participation. These will not only make it more difficult for students to cheat, but will be helpful activities to deepen their learning. Given the innate and inescapable human biases that affect all assessment, there is potential that AI could even help tackle these biases.

Q: Should teachers use AI to write lesson plans?

A: AI can be quite helpful in the idea-generation phase of thinking about curriculums and lesson plans. It generates plausible-sounding ideas to help you plan, however, it is not advisable to use these as a final lesson plan. Lesson plans generated for teachers solely by AI are not tuned to the specific students in your school or the specific communities they come from. Those lesson plans are not going to account for how the plan does or does not connect to school-wide instructional strategies and priorities - indeed, AI can often include suggestions that are not evidence-based, such as outdated ideas about using learning styles. It is unlikely to suggest the same sequence of curriculum or pedagogy as an expert and it won't necessarily plan to tackle key misconceptions or common challenges. And the plan will lack the personality of the teachers themselves. Finally, sometimes generative AI lesson plans can get facts and sources wrong. So while AI can be an helpful first draft partner, don't count on AI lesson plans without a human in the loop and still consider leaning more heavily on expert-authored curriculum materials and schemes.

Q: How will AI change learning?

A: As AI is able to take on more tasks that we once thought required a human brain, it will make what is uniquely human more valuable. AI may be able to do certain things better than humans already and this will increase dramatically in the near future. As with existing technologies, it is likely that students who can use it well will be highly knowledgeable, literate and articulate, able to come up with thoughtful prompts and instructions for AI tools that demonstrate an understanding of the domain of knowledge and able to understand and critically evaluate what the AI produces. AI will change learning significantly in that it will be a powerful companion tool, but it won't change what is needed to be literate: a combination of content knowledge and skills.

NEED HELP?

Additional Resources You May Wish to Explore

Hands-On AI Projects for the Classroom
Each guide provides background information and four student-driven projects that align with subject-area standards, teaching students about AI, its functioning, and its societal impact

Setting Conditions for Success: Creating Effective Responsible Use Policies for Schools
For ideas on how to create effective technology guidelines for your schools

Using AI Chatbots to Enhance Planning and Instruction
Overview of how teachers can use AI chatbots like ChatGPT to design learning experiences and accelerate their workflow.

Artificial Intelligence Explorations Course
This course has been used by thousands of educators to learn how to prepare their students to become AI designers. It is designed for secondary school teachers of any experience level.

AI in the Classroom JumpStart Guide
Focused on ethical and instructional considerations for teachers with guidance on how to connect AI concepts to the curriculum.

A Culture of Improvement: reviewing the conditions on teacher working conditions
Ideas on how to create the conditions for teachers to learn, whether about digital technology or broader pedagogy

5 Tips for Enthusiastic Adoption of Education Technology
Short blog on engaging teachers with technology

National Professional Qualifications (NPQs) from the Teacher Development Trust support leaders at all levels to implement change effectively, based on the very latest research.

The ISTE Standards provide the competencies for learning, teaching and leading in the digital age, providing a comprehensive roadmap for the effective use of technology in schools worldwide.