



Department
for Education

Generative AI in education

Call for Evidence: summary of responses

November 2023

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Executive summary

Over the last year the capabilities of generative artificial intelligence (GenAI) have rapidly increased. At the same time, increasing public interest means that the public, including the education sector, are now using GenAI more regularly.

The Department for Education (the department) opened a conversation with the sector with the launch of a Call for Evidence on the use of GenAI in education. We asked for views and experiences from practitioners across all stages of education, as well as from the educational technology (EdTech) sector and artificial intelligence (AI) experts. The Call for Evidence ran from 14 June to 23 August 2023. We would like to take this opportunity to thank everyone who responded.

It is clear that teachers across primary, secondary and tertiary education are already beginning to see real benefits from the use of GenAI. The responses also provided suggestions on the support that sector would find beneficial, as well as concerns on the use of GenAI in education. We are committed to ensuring the department does all it can to maximise these opportunities whilst addressing the risks and challenges.

Opportunities highlighted by the Call for Evidence include freeing up teacher time, providing additional educational support, including for pupils and students with special educational needs and disabilities (SEND) and pupils and students for whom English is an additional language (EAL), and subject specific applications.

We have used the information gathered in this Call for Evidence to feed into a [GenAI Hackathon project](#) the department is running with Faculty Science Ltd, in partnership with the National Institute of Teaching, to help us understand possible use cases for GenAI in education. This provides an opportunity for teachers from across the country to experiment with GenAI and discover its capabilities in an educational context. We will publish a report on the outcomes of the GenAI Hackathon project in Spring 2024.

Alongside the GenAI Hackathon project, we are investing up to £2 million in Oak National Academy to improve and expand their AI tools for teachers. This funding will help to free up teacher time and support high quality lesson planning. We have also provided a further £137 million to the Education Endowment Foundation to encourage innovative and effective evidence-based teaching, including using technology such as computer adaptive learning and AI.

Responses to the Call for Evidence also highlighted the need to improve access to technology. We want to create an environment where all schools and trusts can use technology effectively and we are investing in the basics, working with commercial providers to accelerate gigabit capable broadband rollout so that all schools have access to a high-speed connection by 2025. Additionally, we are investing up to £200 million to upgrade schools that fall below our Wi-Fi connectivity standards in 55 [education investment areas](#).

The department is also [setting standards](#) so that school, college and trust leaders know what they need to do to ensure their technology is up to date, maintain security and support online safety. The [cyber security standards](#) for schools and colleges, which support schools with how to build their cyber resilience, are signposted in [Keeping children safe in education 2023](#). In response to growing concerns about cybercrime, in April 2022, the department added cyber cover to the [Risk Protection Arrangement \(RPA\)](#). The RPA is an alternative to commercial insurance for academies and local authority maintained schools. The RPA has over 10,000 members (47% of all eligible schools).

The department is collaborating with Ofqual, Ofsted and the Office for Students on our approach to regulation, informed by the Office for AI's [AI Regulation White Paper](#) which sets out the government's first steps towards establishing a regulatory framework for AI. The Office for AI has committed to an iterative approach that will evolve as new risks or regulatory gaps emerge and has already taken steps including establishing the Central Risk Function in the Department for Science, Innovation and Technology. This will identify, measure and monitor existing and emerging AI risks using expertise from government, academia and industry.

We have launched this Call for Evidence in the early stages of our policy development and have acted swiftly to ensure that we can build a strong evidence base and be ready to respond to changes. We will continue to work across government to ensure a joined-up approach to the use and regulation of GenAI, building on the agreements and discussions at the AI safety summit.

The department understands that this technology is evolving quickly. We will continue to monitor the technology as it develops and will continue to engage with the sector, encouraging the spread of best practice. Initial guidance on the use of GenAI can be found in our [policy paper](#) and we will update this as we learn with the sector. Further updates will also be provided through guidance, reports, blogs and webinars.

Addressing concerns and risks

There were also some clear areas of concern around the use of this technology. We will remain alert to the risks and issues around the use of AI in education as they evolve.

The most important thing for a high-quality education is having a human expert teacher in the classroom – the emergence of this technology does not change that.

Some respondents raised concerns that the curriculum will need to adapt to the challenges posed by GenAI. The department is clear that the teaching of a broad, knowledge-rich curriculum is fundamental in giving all students the foundational knowledge required to use emerging technologies such as GenAI in a safe, responsible and effective way. We have reformed the National Curriculum to be knowledge-rich, and GCSEs and A levels to set world-class standards across all subjects. These reforms

were substantial and have made a lasting improvement to qualifications, ensuring they reflect the knowledge and skills pupils need to progress. We are committed to creating a world-leading skills system which is employer-focused, high-quality, and fit for the future. Therefore, we will seek to ensure that the system can adapt to deliver the appropriate skills that pupils and students need for the workplaces of the future.

Schools and colleges should ensure that children and young people are not accessing or creating harmful or inappropriate content online, including through GenAI. The department's [statutory safeguarding guidance](#) provides schools and colleges with information on what they should be doing to protect pupils and students online. This includes doing all they reasonably can to limit children's exposure to risks from the school's or college's IT systems.

It is important to be aware of the data privacy implications of using GenAI tools. [Personal](#) and [special](#) category data must be protected in accordance with data protection legislation. Schools, colleges and higher education institutions (HEIs) should also be open and transparent and ensure pupils understand where their personal or special category data is being processed using AI tools.

Pupils and students own the intellectual property rights to original content they create, and education institutions must not allow or cause pupils' original work to be used to train GenAI models unless they have appropriate consent or exemption to copyright.

There are strict rules in place, set by exam boards, to ensure pupils' work is their own. Sanctions for cheating are serious, including being disqualified from a qualification. Schools and teachers know their pupils best and are experienced in identifying their individual pupils' work. The Joint Council for Qualifications published [guidance](#) earlier this year which reminds teachers and assessors of best practice in preventing and identifying potential malpractice, applying it in the context of AI use. Ofqual speak regularly with exam boards about risks, including malpractice risks. Ofqual expects regulated Awarding Organisations (AOs) to carefully consider the potential impacts AI may have on their qualifications and, where necessary, make changes to the way in which their qualifications are designed or delivered in response.

GenAI tools can produce unreliable or biased information, therefore any content produced requires professional judgement to check for appropriateness and accuracy. Whatever tools or resources are used to produce plans, policies or documents, the quality and content of the final document remains the professional responsibility of the person who produces it and the organisation they belong to.

To harness the potential of GenAI, people need to have the knowledge to draw on to ensure that it is presented with the right information and to make sense of the results that it generates. Access to GenAI is not, therefore, a substitute for having a deep reservoir of subject knowledge held in your long-term memory. GenAI tools can make certain written

tasks quicker and easier but cannot replace the judgement and deep subject knowledge of a human expert.

Introduction

GenAI uses foundation models, including large language models (LLMs), trained on large volumes of data. It can be used to produce artificially generated content such as text, audio, code, images and videos. Examples of GenAI tools include ChatGPT, Google Bard, Claude and Midjourney. This technology is also being integrated within other tools.

From 14 June to 23 August 2023, the department held a Call for Evidence on GenAI in education. The purpose was to understand the uses of GenAI across education in England and the sector's views towards the opportunities and risks it presents. The Call for Evidence documents can be found at:

<https://consult.education.gov.uk/digital-strategy/generative-artificial-intelligence-in-education/>

Main findings from the Call for Evidence

Most respondents were teachers who were early adopters of GenAI with positive views towards this technology. The most common application among teachers was using GenAI to create educational resources, including resources for individual students. Other frequently cited applications included using GenAI for lesson and curriculum planning and to streamline administrative tasks. Some teachers were also experimenting with using GenAI to automate marking and to generate feedback on students' work.

Teachers using GenAI reported benefits including freeing up teacher time and enhanced teaching effectiveness. Reported benefits for pupils included enhanced engagement and improved accessibility and inclusion.

Almost all respondents reported at least some concerns about GenAI use in education. Prominent concerns included over-reliance on GenAI tools (among pupils), academic misconduct among pupils and students, and data protection and privacy risks. For a minority there was an underlying fear of GenAI (and AI) replacing face-to-face teaching. Some respondents also raised the potential for GenAI to exacerbate the "digital divide" and the educational attainment gap, noting that some pupils do not have access to prerequisites to use this technology such as devices or stable internet.

Most respondents were optimistic about the use of GenAI in education in the future due to the perceived opportunity for it to free up teacher time and enable adaptive teaching. However, a minority of respondents were highly concerned about the use of GenAI for education purposes, and ultimately felt that the risks of the technology outweighed the benefits.

Respondents demonstrated a clear appetite for increased support, including from government, to ensure the safe and effective adoption of GenAI in education. This

included the provision of training and guidance, improvements to existing digital infrastructure in educational institutions, regulation around data protection, and wider reforms to curricula and assessment.

Disclaimer: The potential applications set out in this report reflect the views of those who contributed to the Call for Evidence, and not necessarily the view of the department. We are actively building policy to support the sector to use GenAI technology in education in safe, effective and ethical ways.

Methodology

Format

The Call for Evidence was open for 10 weeks, launching on 14 June and closing on 23 August 2023. We received 567 responses in total during this period.

Analysis

The Call for Evidence collected data about respondents and contained 13 open-ended questions for written feedback.

The Call for Evidence received submissions from organisations that operate across multiple jurisdictions, including in England and abroad. This included EdTech and other technology providers, as well as British international schools. To ensure the views of all relevant stakeholders were reflected in the summary of responses, all submissions to the Call for Evidence were reviewed and included in our analysis (see Annex A for the respondent profile).

Throughout this report, we quote a selection of anonymised comments that represent and give further insight into the themes that emerged from our analysis. Where comments have been shortened, the omitted text is represented by an ellipsis in square brackets “[...]” – care was taken to ensure this did not misrepresent what the respondent told us or their tone of voice. Spelling and grammar errors have been corrected where the intended word or words in question were obvious – where this involved modifying words, this is indicated by square brackets. No other changes have been made.

Caveats

When reading this report, it is important to note that the results are only representative of those who responded to our Call for Evidence and cannot be taken to represent the views of all individuals, professionals and organisations.

The suggestions and recommendations in this report represent the views of those who responded to our Call for Evidence – we recognise there may be alternative views on specific issues, and the inclusion of these does not mean they are endorsed or accepted by the Department for Education or Government.

Summary of responses

The Call for Evidence asked respondents to comment on four key themes which are reflected in the structure of the summary of responses. These were:

- **Experiences of using GenAI in education:** how teachers and educational institutions are currently using GenAI, the main challenges experienced, and key impacts or results of use.
- **Opportunities for GenAI in education:** views on how GenAI could be used to improve education, including in which subjects or areas of education.
- **Concerns and risks of GenAI in education:** the main concerns about using GenAI in education, including views on ethics, data privacy and security.
- **Enabling use and future predictions:** expectations about the future role of GenAI in education, support that the sector would like to receive to benefit from GenAI, and activities that the sector would like to see from the department.

Respondents to the Call for Evidence were not a representative audience, and therefore the summary of responses does not represent a balanced view of the education sector and relevant stakeholder groups. There was generally a broad balance of responses across different stages of education and roles, but respondents were much more likely to be early adopters who had used GenAI compared to the general teaching population. In analysing responses, the emphasis has been on reflecting the main views expressed, rather than to assess how many respondents held a particular view.

Experiences using GenAI in education

Questions asked:

- Have you or your institution used generative AI tools in an education setting? If so, could you briefly describe the ways it was used and the specific tools used.
- What were the main challenges you faced in using generative AI and how did you address these?
- What was the result of your use of these tools, including any impacts?

Adoption of GenAI among respondents

Adoption of GenAI tools amongst respondents was high. Most respondents who were working in an educational institution (including teacher leadership and respondents in administrative roles) stated they were using GenAI tools in their role or had experimented with GenAI tools. There was evidence of use of GenAI tools across most educational stages, as well as in a wide range of educational settings including state-funded and

independent schools. The small sample of respondents (63 submissions) who indicated that they represent early years did not explicitly describe how GenAI was intentionally used in early years settings. None of the respondents who indicated that were an early years and childcare provider were using GenAI.

According to respondents, pupils and students were also using GenAI tools. This included teachers encouraging the use of GenAI, such as teaching pupils how to use tools. Some teachers also suspected that there were pupils at their schools using GenAI inappropriately or against organisational policy, including in assessed work.

Some institutions had sought to prevent teachers, administrator, and pupil use of GenAI tools by blocking access or banning tools. This was primarily managed at an institutional level through server restrictions or policies. Others controlled or monitored adoption at their institutions. For example, some institutions allowed a small group of teachers to experiment with “approved” GenAI tools.

There was significant variation in the frequency of use among those who had adopted GenAI. Some reported using GenAI tools daily, and that use was widespread among colleagues. Others had only used GenAI a small number of times and were not aware of others at their institution using GenAI.

We are currently using generative AI through tools such as Canva, which allows all staff and pupils to design and publish imaginative and creative artefacts. We have also made Bard available to a group of trusted staff users. Canva's background remover for images and video, text to image, magic design for presentations and beat match are all impressive and accessible tools we are using on a daily basis.
– *Academic Technologies Lead, Multi-Academy Trust (primary, secondary)*

Respondents using GenAI tended to use non-specialised tools that are widely accessible to the public. Open AI's ChatGPT¹ was the most frequently cited tool used by respondents in educational settings. Other commonly used tools included Google Bard, Midjourney, Bing, Claude, Dall-E, and Canva. Education-specific GenAI applications such as Teachermatic and Elicit were also mentioned. A minority of respondents reported developing tools that use GenAI. This included educational institutions and EdTech providers integrating GenAI into existing platforms or creating new tools that use GenAI.

¹ While the Call for Evidence was open for submissions, OpenAI's ChatGPT used GPT-3.5 and was free to access in England.

Application of GenAI tools

Responses revealed a wide range of uses of GenAI technology for education purposes. For analysis, the applications identified among teachers have been grouped into the following seven themes with more detail in the paragraphs below. The key use case themes are:

- Creating educational resources
- Lesson and curriculum planning
- “Live” use in lessons
- Assessment, marking and feedback
- Administrative tasks
- GenAI skills training and AI literacy
- Research

Other uses not covered in themes above included using GenAI to proofread, edit and improve written content, and to support coding. Applications amongst pupils were also reported, such as using GenAI as a study aid and search tool. These are described below.

Application among teachers

The most common applications among respondents in teaching roles was creating resources, lesson and curriculum planning, and using GenAI to support with administrative tasks.

Creating educational resources: Respondents described using GenAI to create or enhance teaching resources, including designing handouts, worksheets, presentations, images, model answers and quizzes. They had also used GenAI to develop materials for students, including tailoring materials to cater for pupils with SEND. In primary school settings, teachers reported using GenAI to create reading materials or comprehension questions for pupils and students. Teachers responding were keen to stress the importance of checking teaching resources for accuracy and alignment with the school curriculum.

Lesson and course planning: GenAI tools were used to plan and design lessons (including experiments or assemblies) and courses. Some respondents (largely in secondary and further education) reported using GenAI to produce schemes of work. Using GenAI to create or design a whole course was only mentioned in a few instances. Again, teachers described how they took steps to ensure that lesson or course plans produced by GenAI aligned with the curriculum.

Administrative tasks: GenAI tools were used to support and automate a wide range of administrative tasks for both teachers and non-teachers. This included writing letters and emails (e.g. to staff, pupils and their families), developing communication and marketing (e.g. producing content for newsletters, creating social media posts, writing press releases), summarising meeting minutes, writing documents relating to students and to produce institutional documents (e.g. policy documents, risk assessments and frequently asked questions).

“Live” use in lessons: Respondents also used GenAI tools in lessons, for example to generate a good writing example, to explain a complicated concept or idea, as a search tool in class, to convert texts to images as lesson stimuli, and as an aid for specific tasks and activities (e.g. to generate a structure for an essay in a lesson). Teachers also reported using GenAI tools “live” with pupils and students to introduce them to the technology (largely in secondary and further education).

In Food and Nutrition lessons, staff have worked with students to explore prompt engineering to understand how they can get ChatGPT to work for them, as well as using it to scale recipes and write time plans. – *Headteacher, Independent school (early years, primary, secondary)*

Assessment, marking and feedback: GenAI tools were used to help write student reports, generate example questions for exams (including essay questions), produce banks of multiple-choice questions (MCQs), mark or grade student work, and to produce marking rubrics. The language used when describing using GenAI tools to mark essays or coursework, and to provide feedback, indicated that this was more experimental. A small number of respondents described applying GenAI in this way, and others reported testing the performance and effectiveness of using GenAI to critically appraise student work according to a mark scheme, but not use it to formally mark student work. Some respondents, including an exam board, had tested the marking performance of multiple GenAI platforms and noted that none were sufficiently accurate. In one instance, a college had developed its own assessment and feedback platform using GenAI technology. Respondents also reported using AI tools (including GenAI) to detect plagiarism. Some respondents had tested the ability of GenAI tools to produce assignments or essays to better understand how GenAI could facilitate academic malpractice.

The College has developed an online formative assessment platform called FirstPass which supports students with real-time feedback as they respond (using free-form text) to open-ended questions that have been set by their teachers. The platform utilises large language models such as OpenAI’s ChatGPT and AI21. – *Learning Technology Manager, Further education college*

AI skills training and AI literacy: Some respondents were delivering training to colleagues and pupils and students on what GenAI technology is and how to use GenAI tools, as well as raising awareness of the risks and limitations of tools to support AI literacy. Respondents reported giving live demonstrations of GenAI tools as part of training or teaching. In a few instances, respondents described how they had embedded GenAI tools into course content to teach students how to use and apply GenAI in their work.

[The institution] has embedded generative AI skills and use within level 7 MSc Advanced Computer Networks course assessment approaches and also in level 7 MA Journalism assessment. In both cases learners are taught how to use generative AI (text, images, video) alongside its limitations. – *Pro Vice-Chancellor, University*

Research: Respondents who were teachers described using GenAI tools as a search engine to support their work, including to research a topic or concept that they planned to teach. GenAI was also used to support other research applications including summarising articles, books and videos, and to aid data analysis (e.g. identifying trends and themes). Teachers in higher education also reported using GenAI to support academic research including identifying relevant literature, summarising literature, and to generate hypotheses or ideas for research.

Other applications reported by respondents included using GenAI:

- To proofread (e.g. check grammar and spelling), simplify, reduce or improve the quality and readability of written outputs.
- To produce a transcript or translate text.
- To develop and check code.

Application among pupils and students

Respondents who were teachers reported that pupils and students at their institution were using GenAI:

- As a tool to complete assignments or work (e.g. to produce an essay structure).
- To produce content including presentations, images, and artwork.
- As a search engine tool (e.g. to explain topics or concepts or to find information).

Some respondents who were teachers suspected that there were students at their institution who had used GenAI to write essays and assignments (including coursework) that they had submitted as their own work. These respondents raised concerns related to plagiarism and academic malpractice.

Impact of GenAI tools

Of those using or experimenting with GenAI in education, a majority (over two thirds) reported a positive result or impact of use. This included freeing up time (for teachers and administrative staff), and the ability to better engage and support students by creating interesting resources.

The remaining respondents were divided between those who felt it was too early to tell what the impact or result of their or their institution's use of GenAI was, those who reported a mixed impact (with some positive and negative results), and those who reported a negative impact. Negative results mostly related to suspected academic malpractice among students and GenAI tools producing low-quality outputs that took time to correct. When reporting the impact of GenAI use, most respondents shared anecdotal and qualitative feedback.

Positive impacts for teachers

Respondents reported a number of ways that they felt they (or their colleagues) had benefitted from the use of GenAI.

Saving time: Teachers using GenAI tools in their role felt they were able to save time by automating tasks. Quicker lesson planning, scheduling, note-taking, marking, content creation and report writing led to significant time savings for some (though time was still required to check and edit outputs). This enabled teachers to change how they spent their time. As a result of saving time on tasks by using GenAI, some reported spending more time doing work that they believed to be “more impactful”. Examples of this included supporting students or for continued professional development (CPD). For others it reduced their overtime, improved their work-life balance and increased job satisfaction by reducing time-consuming or repetitive tasks.

Massive positive impacts already. It marked coursework that would typically take 8-13 hours in 30 minutes (and gave feedback to students). – *Principal, Academy (secondary)*

High quality and creative teaching: Respondents described using GenAI to generate creative ideas to teach a course, concept or topic, such as to provide a teaching methodology, activity or experiment. GenAI was also perceived to produce good quality resources, or to produce a first version of a resource that teachers could improve upon. A few teachers noted that GenAI enhanced their knowledge, enabling them to develop better learning materials.

[It] makes lesson planning quick with lots of great ideas for teaching and learning. – *Director of Teaching and Learning, Adult education provider*

It has given very experienced staff new ideas for activities within a lesson, and conversely, it has given new lecturers ideas to help them develop. – *Lead practitioner, Further education college*

Confidence and development: As a result of using GenAI tools, some respondents reported feeling more empowered, informed, or confident in their role. A few noted that for EAL teachers, GenAI could support their communication with students and colleagues. Use of GenAI also enabled some teachers to improve their digital skills.

It really helped me when I thought I knew things but wasn't sure about the reasons behind them. It was also very useful when I had to teach something other than math[s] and needed to prepare quickly. These things were mostly about planning and organising. English is my second language, and I use ChatGPT to check my writing. It has boosted my confidence and saved me a lot of time. – *Lecturer, Further education college*

Positive impacts for pupils and students

Engaging and creative resources: GenAI produced teaching materials and activities that respondents felt were interesting and interactive and were perceived to enhance pupil engagement. Some respondents reported increased pupil creativity and confidence when completing tasks with assistance from GenAI.

Elevated Creativity: Acting as a scriptwriter for the drama department and radio shows, ChatGPT has offered new perspectives and sparked creativity in these initiatives. – *Subject Lead, Academy (secondary)*

Personalisation: GenAI enabled teachers to quickly tailor teaching resources according to a particular student's needs, in turn supporting engagement and learning. Teachers were also able to produce personalised study and revision plans for pupils based on their performance. Teachers reported that personalised resources helped them to provide better support for SEND and EAL pupils.

Accessibility and inclusion: GenAI tools were also perceived to support pupils from disadvantaged backgrounds who can use GenAI tools to assist them with their work, where they otherwise may not have help.

I have used it to help students structure work, to get over the blind fear caused by a blank page and be able to start to order their thoughts. For students from less advantaged backgrounds who may not have been taught to write in the form of a traditional essay, this helps them break the ice and acts as a useful leveller for students. – *Vice Dean, University*

Regular feedback: Some respondents reported using GenAI to provide students with feedback faster and more regularly, enabling pupils and students to improve and develop their work.

Members have reported that generative AI has allowed staff to provide more personalised learning experiences for pupils, it has supported marking and feedback, and in some cases has fostered a higher level of creativity among pupils by generating suggestions and assisting them in projects. – *Professional membership organisation (schools)*

Other impacts for teachers and students

Approximately a third of respondents using or experimenting with GenAI in education reported a mixed or negative impact or noted that it was too early to tell what the impact of their use of GenAI was. Some respondents who felt that GenAI use in education had a negative impact reported suspected academic malpractice at their institution. As a result, teachers needed to dedicate additional time to check submitted work for signs of AI use and monitor pupil use. Those reporting a negative result or impact also felt that GenAI outputs were of a poor quality, which then took time to improve or correct to a sufficient standard for use.

Challenges to adopting GenAI

Respondents reported five broad challenges that they had experienced in adopting GenAI:

- User knowledge and skills
- Performance of tools
- Workplace awareness and attitudes
- Data protection adherence
- Managing student use
- Access

Many of the challenges to adoption reported by respondents overlapped with concerns about this technology. These challenges were perceived to present barriers to individual use along with wider adoption in educational institutions.

User knowledge and skills: Most respondents said that lack of skills or knowledge hindered their or their colleagues' ability to use GenAI tools effectively. That included awareness of potential applications, knowing how to instruct tools or use prompt engineering, and knowing how to use GenAI in line with good pedagogical practice. Those using GenAI had dedicated time to develop their knowledge and skills and train

others. Another challenge was knowing how to use GenAI tools ethically and safely without breaching data protection policies and laws. Some respondents mentioned a lack of institutional support, training and understanding about GenAI uses. Challenges in navigating the GenAI landscape due to the speed of technological advancement and the large number of tools available were also raised.

Performance of tools: Among respondents there were frequent reports of GenAI tools producing inaccurate content and biased results, and issues such as Americanised spelling. Many highlighted the need to review and correct outputs as a result. Some respondents, including an exam board, had tested the marking performance of multiple GenAI platforms and noted that none were sufficiently accurate. A few indicated problems with service availability due to large numbers of users accessing tools at any one time.

Workplace awareness and attitudes: Many noted resistance to the use of GenAI by institutions or colleagues due to the perceived concerns and risks it presents, scepticism about GenAI's capabilities, or fear about the impact on teaching. Some also noted disinterest in or a general lack of awareness of GenAI among colleagues. As noted previously, some institutions have banned or blocked access to tools on institutional devices, resulting in respondents accessing tools at home or on personal devices to complete work-related tasks.

Data protection adherence: Respondents expressed concerns regarding the safeguarding of personal (including pupil and student) data and non-compliance with school data protection policies or General Data Protection Regulation (GDPR). In response, some respondents reported their institutions were dedicating time to risk assess tools in line with policies, and develop new policies to ensure tools are used safely. In some instances, teacher and pupil access to GenAI tools was restricted due to data protection concerns, limiting adoption.

Managing pupil use: Managing academic malpractice among pupils was identified as a challenge to adoption. Additional challenges related to pupil exposure to inaccurate, biased, or otherwise harmful content, and the ability to safeguard pupils who are using GenAI tools. Young pupils and those with SEND were deemed to be especially at risk. Respondents also noted that pupil access to tools may be limited depending on their access to devices and Wi-Fi outside of educational settings.

Access: Paywalls limiting access to specific tool functionality or premium versions of tools was raised as a challenge. Additional challenges related to access included institutions banning platforms, issues around integrating GenAI tools into existing educational technology systems, and ensuring tools are accessible to pupils, such as those with SEND who may have accessibility needs.

Ensuring access is a key challenge, particularly to premium tools such as GPT Plus. In our evaluations, these premium tools

consistently performed better than the free versions. Both students and staff present huge variation in confidence in use of and exploring these tools, and their experiences of doing so. Significant support is required to assist students and staff to use these tools to their full potential. – *Head of educator development, University*

Opportunities for GenAI in education

Questions asked:

- How do you think generative AI could be used to improve education?
- What subjects or areas of education do you believe could benefit most from generative AI tools?
- Are there specific subjects or areas of education where you believe generative AI should not be used? Why?

Attitudes towards GenAI in education

Most respondents in the Call for Evidence were broadly optimistic about the use of GenAI in education. This was due to the perceived opportunity for GenAI to free up teacher time and enable tailored support for pupils. Reducing workload was identified as a key challenge facing teachers that GenAI could help mitigate.

A minority of respondents were highly sceptical of GenAI in education, and ultimately felt that the potential risks outweighed the opportunities GenAI presents.

Opportunities identified by respondents

The perceived opportunities for GenAI to support teachers and students generally aligned with the current applications reported in the previous section.

Perceived opportunities for teachers

Freeing up teacher time: GenAI was perceived to enable teachers to automate tasks (such as administration, report writing, lesson planning, content creation and marking), in turn saving time and enabling teachers to dedicate more time to interacting with pupils and students.

Improving teaching and educational materials: Teachers could use GenAI to aid creativity by suggesting new ideas and approaches to teaching, in turn improving the quality of teaching materials.

Assessment and marking: Using GenAI to generate assessment questions, mark student work, and produce feedback was identified as a key opportunity to save teacher time.

Teacher professional development: GenAI could support teachers' CPD, by helping them to stay abreast of their field, including understanding the latest pedagogical strategies. One respondent suggested using GenAI to create personalised learning pathways for teachers based on their skills and areas for development.

[I]t can enable teachers to dedicate more time to their core capability - that of actually teaching. Currently, a disproportionate amount of their time is taken up with lesson planning and marking, for example, both of which can be tackled utilising AI. – *Assistant Principal, Local authority maintained school (secondary)*

Perceived opportunities for pupils and students

Adaptive teaching: Using GenAI to deliver adaptive teaching was identified as a key opportunity to improve education. GenAI could be used to analyse students' performance and pace, and to tailor educational materials accordingly. GenAI's ability to quickly generate explanations at varying educational levels could help explain complex concepts to pupils in a way they understand. Struggling students could be quickly identified and supported, while high-performing students could be challenged with more advanced materials.

Intelligent virtual tutoring: Respondents were enthusiastic about the potential for GenAI to be used as a "virtual tutor", delivering one-to-one support for pupils and enabling remote and self-directed study. This was considered an opportunity that could address inequity in access to out-of-classroom support, and benefit disadvantaged pupils who are less likely to access private tutors.

High-quality and engaging teaching materials: Respondents reported that GenAI could make content more engaging, interesting, and interactive. Examples provided included AI-generated simulations and virtual learning environments.

Accessibility and inclusion: Respondents felt that GenAI presents an opportunity to better support particular groups of students.

- EAL and foreign language students could use GenAI for a range of uses from language teaching, to correcting spelling and grammar of written work.
- For students with SEND, teaching materials could be more easily and quickly differentiated for the specific needs of students.
- Students who struggle with task initiation could use GenAI as an aid or tool to get them started. For example, breaking down a task into manageable activities.

Supporting creativity: GenAI was perceived to be a tool that could enhance students' creativity by generating ideas.

Real time feedback and assessment: GenAI could be used to review and assess pupils' work and share feedback more regularly and/or in real-time. In addition, GenAI could help standardise assessment scoring to ensure fairness.

Employability and careers support: Some highlighted the potential of rapid availability of information and relative ease of access to support lifelong learning and professional skills development. GenAI could support students to consider their employability and future careers by helping them to explore different career options and deliver tailored careers advice and guidance.

Perceived opportunities for institutions and educational stages

Opportunities for GenAI to support educational institutions included:

- **Efficiency gains:** automating and streamlining tasks with GenAI and giving teachers time to focus on the highest value activities was perceived to help improve the productivity and efficiency of educational institutions.
- **Insights and analytics:** respondents expected that institutions would be able to use GenAI to conduct data analysis and generate insights, which could support financial management.

Respondents rarely specified opportunities for specific educational stages, but respondents from HEIs and academia tended to highlight the opportunity to use GenAI as a tool to support academic research (e.g. research search engine, data analysis).

Perceived opportunities for the education system

Some respondents felt that GenAI presents an opportunity for more significant changes to the education system related to assessment and curricula.

- **Assessment:** Respondents felt that student use of GenAI could undermine current approaches to assessment. Suggested assessment approaches to account for GenAI use included oral examinations and scenario and project-based assessment.
- **Curricula:** More significant changes to curricula were also identified as an opportunity for GenAI to improve education. Respondents felt that AI should be integrated into teaching pedagogies and the curriculum, supporting pupils and students to develop the digital skills necessary for succeeding in an AI-enabled workforce in the future.

Perceived subject specific opportunities

Respondents were asked for their views on subjects that they expect to benefit from GenAI the most, and subjects where they believe GenAI should not be used. Many respondents felt that all subjects could benefit since GenAI's capabilities are broadly applicable. However, subject specific opportunities and concerns were also identified. Opinions were not united, and some strong and conflicting views emerged in support of certain areas and against it.

The most frequently cited subjects considered most likely to benefit were languages and STEM subjects. Respondents also anticipated that some subjects (e.g. computer science) will adopt GenAI faster and benefit sooner.

Subjects where some respondents felt GenAI should not be used were creative subjects (including art and music), essay-based subjects, and some social science and humanities subjects (including philosophy, ethics, law and history). A few respondents expressed the opinion that GenAI should not be used by students in assessed work or by teachers to mark assessments.

Some stated they were unsure or felt it was too early to say which subjects should or should not adopt GenAI. There was also a sense that, in practice, it would be challenging to restrict or limit use to particular subjects, given that tools are now widely accessible.

Subjects that respondents expect to benefit the most from GenAI included:

- **Languages:** There was enthusiasm for GenAI's potential to be used to generate language exercises and conversational prompts, as well as for interactive conversations and real-time language practice and feedback. The level of language exercises could be tailored to individual students.
- **IT, computer science, and programming:** GenAI could be used to generate and correct code, to provide guidance on teaching how to code (including programming languages, coding techniques, code concepts and debugging), and for software and game development. Some respondents noted that AI is not currently referenced in the computing national curriculum.
- **Science:** Respondents speculated that GenAI could be used for interactive simulations, virtual experiments, visualisations, and data analysis. GenAI could support teaching across science subjects by generating multiple explanations for complex processes. Across STEM subjects, GenAI could be used to create multiple-choice question banks.
- **Engineering:** GenAI's capabilities to simulate experiments, model complex systems, analyse data (e.g. from machinery and equipment), optimise designs and predict outcomes were perceived to be particularly beneficial for engineering. Some respondents noted that GenAI could support related fields, such as robotics.

- **Maths:** Some anticipate that GenAI will support pupils with step-by-step mathematical problem solving and generating variations of questions. Though some noted that GenAI's performance in solving mathematical problems is currently weak. Marking in maths could be automated using GenAI.
- **English:** GenAI's idea generation capability was perceived to support writing (e.g. generating prompts for writing exercises). It could also assist those studying English with generating and analysing text, comprehension, as well as improving the quality of writing and grammar.
- **Humanities and social sciences:** GenAI's research and analysis capabilities were perceived to be well suited to the humanities and social sciences. It could also be used to generate case studies, timelines and simulations (e.g. of historical events), as well as to develop arguments and offer alternative perspectives.
- **Art, music and design:** Some felt GenAI could be used across creative subjects to generate prompts/ideas, act as a "creative collaborator", and produce feedback on compositions. Given that GenAI can create music, images, and videos, some respondents perceived it to be particularly applicable in creative subjects. Related creative professions including photography, architecture, interior and graphic design could also benefit.

Subjects that some respondents opposed use of GenAI in were:

- **Creative subjects:** Some felt GenAI use in subjects like art and music could restrict or replace original creativity and thinking, and limit personal expression.
- **English:** Some raised concerns that GenAI use could negatively impact literacy skills developed in English, and many felt that writing is a fundamental skill that GenAI should not automate. There was a mix of attitudes towards what "acceptable" GenAI use in writing is. Some felt GenAI could support idea generation for writing, while others opposed any GenAI use. There was strong opposition towards pupils copying AI-generated content for essays.
- **Social sciences and humanities:** Some social science subjects (such as philosophy and ethics, history and law) were perceived to require complex reasoning and nuanced discussions. There was a sense that humans would need to facilitate this due to the complexity and the potential risk of bias.
- **Relationships and sex education (RSE):** Respondents opposed GenAI use in subjects where children and young people might share personal information or discuss sensitive or emotional issues. Respondents emphasised that teacher support and empathy is of paramount importance.
- **Education for young children:** A few respondents felt that GenAI should not be used in educational settings with young children due to the perceived importance of human interaction with children to support social and emotional development.

Other areas of education where some respondents opposed use of GenAI were:

- **Assessment:** There was opposition to student use of GenAI tools in assessed work, including coursework, exams or marked assignments. “Authentic” work was perceived to be written entirely by students, without support from technology. A few respondents felt that GenAI should not be used to fully automate marking and feedback without teacher oversight.
- **Administration:** Some administrative applications were opposed including the use of GenAI to screen student applications or to analyse student data, due to concerns related to bias. If GenAI is used for these applications, respondents encouraged human oversight of AI-decisions.

Concerns and risks of GenAI in education

Questions asked:

- What are your main concerns about using generative AI in educational settings? If at all, have these concerns impacted your use of generative AI? Please explain how.
- Are there specific subjects or areas of education where you believe generative AI should not be used? Why?
- If any, what are your views regarding ethics, data privacy and security when using generative AI in education?

Attitudes towards risks and challenges of GenAI in education

Although most of the respondents to the Call for Evidence were broadly optimistic about the use of GenAI in education, almost all reported at least some concerns about potential risks. A very small group (n=20) of respondents cited no concerns about GenAI. An even smaller minority (n=8) were unconditionally pessimistic, expressing scepticism that their concerns about the impact of GenAI on education could be mitigated.

There was generally a high level of consistency across the responses, with a common set of issues raised by respondents from different educational stages and sectors. The most prominent concern was that teachers and students would come to over-rely on GenAI tools, hindering students’ acquisition of skills and knowledge and reducing the quality of teaching. This was rooted in the widespread concern that GenAI tools could not be relied upon to produce accurate, high-quality outputs, either because they sometimes produce factually inaccurate information or because they perpetuate biases from their training data.

Another prominent concern was data protection, privacy and security. Different categories of respondent displayed different levels of concern over data and security issues. While some respondents believed that the disruption caused by GenAI would require fundamental changes to the education system, others—notably respondents from EdTech companies—suggested that tailor-made technological solutions could help to mitigate the risks.

Respondents' suggestions for other potential mitigations fell into two broad categories. Some respondents sought to support use of GenAI through interventions like new policies or guidance, encouraging clear communication and open discussion, and offering training to students and staff. Others took a more cautious approach, seeking to limit or block access to GenAI tools, or simply deciding not to use tools themselves.

Risks identified by respondents

Over-reliance on GenAI tools

By students: Many respondents feared that students will rely on outsourcing certain types of cognitive task—such as essay writing or formulating written answers to questions—which would compromise their knowledge and skill development by encouraging them to passively consume information. Some noted that GenAI lacks the ability to logically reason. Some respondents believed that GenAI tools would encourage students to look up information more frequently, which might hinder their ability to recall it later. One respondent cited research suggesting that some features of GenAI tools' user experience could heighten the risk of over-reliance—for instance, adding “thinking” speech bubbles to AI chatbots may warp children's perception of what AI tools are capable of.

Just as it is right to teach pupils arithmetic even if we can all use calculators, we believe that children and young people need to achieve certain levels of literacy and numeracy to make a success of their lives. – *Awarding body*

By teachers: While generally enthusiastic about the potential for GenAI to help teachers create tailor-made teaching resources quickly, some respondents expressed concerns that over-reliance on these practices could compromise teachers' “human connection” and interaction with their pupils and students. Some believed that tasks perceived to be dull or difficult, and so more likely to be outsourced to GenAI, like marking and writing reports and letters, could hinder teacher skill development.

[A concern is] the ease with which ‘mundane’ tasks can be given to AI - response letters to parents, pupil reports, essay marking, etc. However, it's in these mundane tasks that understanding and your

effectiveness as a teacher is built. – *Deputy Head, Local authority maintained school (primary)*

Over-reliance on GenAI was the most prevalent concern raised across the different categories of respondent, at all educational stages, but was an especially high-priority concern for respondents from HEIs.

Inaccurate, biased and harmful GenAI outputs

Inaccurate outputs: Many respondents referred to the tendency of GenAI tools to return inaccurate outputs which was seen as especially concerning given GenAI's capacity to combine accurate and inaccurate information in a seamless and convincing way, making it harder to distinguish the truth from false information. Also of concern was GenAI's ability to "understand" or explain when and why it provides false information. Although some respondents were optimistic about one day using GenAI to help with marking maths questions, some noted that GenAI tools are not capable of mathematical reasoning and can make basic mathematical errors. Some were aware of third-party plug-ins that may be able to mitigate this issue.

Biased outputs: A consistent concern across respondents was that GenAI trained on data scraped from the internet could encode and perpetuate biases, outdated attitudes, or unbalanced political perspectives from training data. This could narrow the scope of knowledge and worldviews when teaching, for example, about historical events. One respondent reported that LLMs could infer characteristics or identities of their users and feed these assumptions back into ongoing training of the model, resulting in negative or discriminatory outcomes for individual users. There was concern that biased outputs may have a disproportionate impact on students from minority groups.

Safeguarding and harmful outputs: Several respondents raised the prospect of safety and safeguarding issues around disturbing, harmful, or age-inappropriate outputs. This is especially the case for GenAI tools which produce images, but also applies to text-based tools. The prevalence of these concerns was generally high across respondents, although issues around safeguarding were higher among respondents from earlier educational stages.

While particular AI tools might be designed to support wellbeing, GenAI increases the risks for safeguarding. For instance, a pupil who has mental health issues might seek to use the AI to explore methods of self-harm. It would not be appropriate for GenAI to be used where such risks could arise. – *Trade union*

Assessment, plagiarism, and academic integrity

Student use: There was widespread concern among respondents that GenAI could facilitate academic misconduct by pupils and students in exams and assessments. Some

teachers reported already detecting student GenAI use, sometimes leading to disciplinary processes. There was also a high level of scepticism about the usefulness and effectiveness of AI detection tools. Some feared that detection tools might produce “false positives” resulting in some students being unfairly penalised.

Teacher use: Several teachers were wary of using GenAI to mark assessments noting that GenAI marks would be hard to trust due to accuracy and performance concerns, and given the importance of students’ marks to their futures. There was also concern that students may not accept results of AI-marked assessments, and that there are no established dispute-resolution frameworks in place to mediate AI marking disputes.

Errors in connection with [qualifications and marking] can have adverse political, legal, regulatory and/or reputational consequences.
– *Awarding body*

Replacement or undermining of teachers

Some respondents feared that cost pressures and difficulties recruiting teachers could create an incentive to fill gaps using GenAI and AI tools, resulting in a lower standard of teaching, or that AI could eventually replace some teachers altogether, resulting in job losses. This was raised by 17 respondents, most of whom taught at primary or secondary level, making it less common than the concerns cited above, but still relatively consistent.

Among those respondents who raised this issue, several highlighted the importance of human connection and interactivity in teaching, with some citing the negative impact that remote and online teaching had on children during the pandemic. Respondents felt this to be an especially problematic issue in subject areas requiring more sensitive, nuanced, or emotionally intelligent teaching, such as RSE or contested historical topics.

[I am concerned about] the possibility of AI being used to 'replace' the need for qualified teachers in the classroom—if learning opportunities can be created using AI then, in theory, anyone could deliver the content, or it could be delivered remotely, and the thought of the collaborative, social side of school disappearing is scary. – *Editor of online education resources*

Data protection and privacy

Teacher respondents raised this issue less urgently than other groups, although its salience was higher among respondents who taught at earlier educational stages. The main cause for concern was that personal data—for example, information related to a pupil’s identity, grades or behaviour—may be input into GenAI tools, the developers of which are often opaque about their use of data. They also noted the precedent for data breaches from LLM developers—for instance, ChatGPT reproducing data inputted as prompts (see “Dependence on Big Tech companies” below).

Respondents expressed the view that proper protections and best practices for AI-collected data are not yet ready, particularly in relation to existing privacy laws and regulations, and that sensitive data could be shared improperly or stored for indefinite periods. Several respondents called for policies banning the inputting of pupil data into GenAI tools. Some respondents suggested it would not be adequate simply to remind or encourage users not to input personal data, because it would be too challenging to systematically enforce this across a whole system, and even inputting seemingly innocuous data can create “footprint” of individual users over time.

Some respondents framed their concerns about data privacy in terms of a threat to children’s rights, under international agreements like the UN Convention on the Rights of the Child. The general view among these respondents was that existing legal protections, if enforced properly, would be sufficient to resolve many of these issues.

AI literacy and digital divides

Respondents raised the potential for GenAI to exacerbate inequality, noting that some pupils and students do not have access to basic equipment such as hardware or stable internet. They also speculated that wider adoption of paid-for versions of GenAI tools may worsen this.

Some respondents highlighted the need for evenly distributed access to high-quality digital infrastructure and teacher technological expertise. Concerns were raised across the board that pupils and teachers are ill-equipped with the skills and knowledge to use GenAI (and AI) tools safely and effectively in the classroom. Some respondents noted that such “AI literacy” is likely to have a bearing on students’ subsequent careers, as GenAI is expected to have a major impact on future workforce skill requirements.

Copyright and intellectual property

A less-frequently raised issue among respondents was the concern that GenAI outputs used copyrighted material in their training data, or that outputs could contain elements of copyrighted material. This respondent also warned that generated outputs mimicking artists could be plagiarising those artists, and that creators of educational content could lose out.

Dependence on Big Tech companies

Across respondents, trust in large tech companies was low. Several respondents expressed concern that such companies might exercise undue power within the education system and not be held accountable for any negative impacts. Others were concerned that tech companies’ incentives (e.g. monetary reward, data use) may not line up with those of pupils, students and teachers. This could be worsened, some respondents suggested, by regulators struggling to keep up with the pace of technology change or under-regulating the use or impact of AI, leading to poor transparency, lack of accountability, and unclear liability for any potential harms that may arise.

Opportunity cost: lack of evidence and awareness

Respondents who were more optimistic about the impact of GenAI, raised concerns that poor awareness and lack of a strong evidence base could lead to opportunity costs as institutions err on the side of caution of adoption. Some of the respondents from schools and colleges reported wanting to wait for new research or for clear instruction to emerge before they took final decisions on policy.

Some respondents predicted that reluctance on the part of some teachers, pupils and other users could also hinder adoption of GenAI, due to unfamiliarity with or concerns about this technology. They emphasised that users need support to build their understanding of and confidence using GenAI tools.

Enabling use and future predictions

Questions asked:

- What support do education staff, pupils, parents or other stakeholders need to be able to benefit from this technology?
- What activities would you like to see the Department for Education undertaking to support generative AI tools being used safely and effectively in education?
- How do you see the role of generative AI in education evolving in the future?

Supporting educational staff, pupils, parents and other stakeholders

Respondents offered a range of ideas for how to support the sector to benefit from this technology including:

- Training
- Guidance
- Regulation
- Communication and engagement
- Implementation and access support
- Reforms to curricula and assessment
- Research and monitoring

Respondents encouraged the department to play a prominent role in shaping GenAI use in education. There was a broad acknowledgement of a need to balance risk and reward. Most respondents wanted the UK to become a proactive, influential player in this emerging field. At the same time, respondents expressed a desire to proceed with caution, due to the concerns and risks identified.

Training

Almost all respondents called for some form of training for teachers and other users of GenAI in educational settings. The most requested training topics were basic digital literacy, AI literacy, safe and ethical GenAI use, alignment of GenAI with good pedagogical practice, and how to prepare for GenAI's impact on the skills students will need as they enter an AI-enabled workforce. Some noted that training on GenAI use would need to be specific to each subject and educational stage. There were also calls for accredited GenAI training to be integrated into teacher CPD as well as in initial teacher training (ITT) courses.

Respondents emphasised that the fast pace of technological change in this area had left them playing catch-up (including with their own students), and that training would require frequent updates. Many respondents reported difficulties locating up-to-date and reliable information about GenAI, and suggested that training be accompanied by published toolkits, guides and case studies. Some pointed to EdTech leads being appointed as dedicated staff to provide additional technical support. There was strong consensus among respondents from state schools that these initiatives would require increases in central government funding.

Training for students on appropriate GenAI use was also identified. Some noted that this would need to be based on guidance from exams and qualifications providers on what constitutes legitimate GenAI use in assessed work. A few respondents also suggested training for parents to support adoption.

Every user within this the education sector requires comprehensive support to enhance their digital proficiency in this context. A substantial investment in training and professional development is imperative, catering not only to academic staff but also extending to non-teaching personnel. – *Chief Executive Officer, Membership organisation*

Guidance

To support training, there was a desire for guidance on GenAI use in education, with some calling for clear “boundaries” and rules to be set. The most requested guidance topics were addressing academic malpractice, safe and ethical use, and data privacy and protection.

Clear policies and guidelines should be established regarding the use of AI in education, including data privacy, security, and ethical considerations. These should be communicated effectively to all stakeholders and should be regularly reviewed and updated as necessary. – *Managing Director, Education non-profit*

Regulation

Some called for regulations for developers around data protection, privacy, and storage limitation, and affirmed that new GenAI technologies should undergo a Data Protection Impact Assessment and Child Rights Impact Assessment. They also affirmed the duty of developers to monitor GenAI outputs for inaccuracy, bias, misinformation and other types of harmful content.

Across respondents of different categories, there were consistent calls for official vetting of GenAI tools, and for a national GenAI framework incorporating guidelines on ethics, governance and efficacy benchmarks, as well as quality assurance policies. Some respondents called for specific regulatory reforms, for instance an update to the department's statutory guidance on Keeping children safe in education and the Filtering and Monitoring standards, reviewing the Data Protection and Digital Information Bill and their impacts on individuals' protection. There were also calls for regular reviews to assess use of children and young people's data (particularly those with protected characteristics).

Communication and engagement

Several respondents emphasised the need for enhanced dialogue between stakeholders, to share best practices and innovations, and ensure that adoption of GenAI in education is informed by those likely to be impacted. Respondents identified a broad and diverse group of stakeholders to take part in these discussions, from those employed by educational institutions to students, youth support services, local authorities, professional bodies, industry experts, as well as government officials. Emphasis was often placed on the importance of engaging students and teachers.

As well as stakeholder discussions, several respondents called for wider public engagement and awareness raising, to alleviate public anxiety about the impact of GenAI and restate the ongoing importance of human teachers in education. EdTech companies were especially likely to express this sentiment.

Many respondents would like the department to play a central, convening role in this process, and collaborate with other departments when formulating GenAI-related policy. Some respondents said the department should set up forums for teachers around the country to discuss best practice. Respondents suggested several options for collaboration including advisory boards, new working groups, or even a dedicated "Office for EdTech" within the Department for Education.

We are pleased that the Department for Education has launched this consultation, but strongly encourage cross-departmental discussion to bring together AI experts and educators to ensure that the UK is at the cutting edge of developments with AI and is able to guide

educators and pupils alike to take advantage of these opportunities as well as be aware of the pitfalls. – *Assessment provider*

Implementation and access support

Across educational stages, teacher respondents expressed concern that pressures on workload and financial resources could hinder implementation. Most teachers expressed optimism about implementing GenAI effectively, if afforded enough time and money.

In response to problems around access and the digital divide, respondents called for upgrades to existing digital infrastructure in schools, including high-speed internet and devices for students. They also suggested that extra financial support might mitigate the introduction of paywalled versions of popular GenAI tools, and that extra funding may also be required to purchase emerging EdTech tools and platforms. It was emphasised that this support would need to vary across different regions, and that special consideration would need to be given to SEND and EAL students. There was also a split between respondents who expressed a preference for well-known GenAI products by larger companies, such as OpenAI's ChatGPT, Microsoft Copilot and Google Bard, and others who urged government to explore alternatives to major technology players to encourage competition and prevent over-reliance on large corporations.

Curricula and assessment

There was a lower level of consistency across this topic, with different issues raised by respondents from different educational stages and sectors. Many respondents called for GenAI skills and awareness to be embedded in the National Curriculum, as well as forming part of higher educational programmes. Some felt that AI literacy should be on a par with maths and English, given its perceived importance in a future AI-enabled society. Respondents judged AI ethics and academic integrity to be of particular importance for students. Some respondents suggested that these curricular additions should be taught in a "peer-to-peer" pedagogical style, affording students the opportunity to work together to test out ideas and tackle problems.

Elsewhere, suggested changes to the curriculum varied by educational stage. Early-years and primary school teachers were interested in exploiting GenAI to introduce more imaginative teaching methods into the curriculum. One respondent suggested BBC Bitesize-style courses for younger children. However, some respondents urged caution when considering GenAI for early years pupils, suggesting that it should be integrated into the curriculum at a later stage of children's education, to allow them to develop cognitive skills during formative years.

Aside from improving AI literacy, some respondents called for changes in assessment to tackle the challenge of academic malpractice due to GenAI use. HEIs were especially likely to mention cheating and plagiarism. Potential responses included practical prevention measures (e.g. extra invigilation, AI detection tools), as well as more

fundamental reappraisals of core assessment criteria to refocus on “higher-order” skills and oral examination.

The DfE [Department for Education] should set out plans for a review of current subject content and assessment constructs ahead of the next round of qualification and curriculum reform. The DfE needs to ensure any subject content criteria for qualifications reflect the impact and broadening use of AI in education in terms of what knowledge and skills students are required to have for each qualification. There should be a review of current criteria to ensure they are still fit for purpose, and consideration given for when future criteria are developed. – *Awarding body*

Research and monitoring

Several respondents recommended running pilot programmes to assess the effectiveness of different platforms and tools, as well as conducting regular audits and longitudinal studies to evaluate outcomes. A few respondents recommended starting at a local level, or only in universities, before further expansion. Some respondents suggested funding for researchers to investigate GenAI in educational settings, or to support experimentation through partnerships between educational institutions and technology developers and providers.

Future evolution of GenAI in education

Most respondents were optimistic about the future of GenAI in education. Those who were very positive felt GenAI could have a transformational and profound impact on the education system if adopted safely and effectively. Some noted that GenAI technology is “here to stay”, given it is now widely accessible to the public, and that banning or blocking access to GenAI technology in education would be “pointless”. In this context, there was a desire for clear direction to shape how GenAI is used in education.

While many respondents were hopeful and optimistic about the potential for GenAI to improve education, there was a sense of uncertainty about whether this would be achieved in practice. Respondents raised numerous dependencies, including adoption within the sector, application to suitable use cases, and the ability to mitigate perceived risks of GenAI. Some expressed the view that the government’s response would be an important factor in the future evolution of AI. A minority of respondents were highly pessimistic about the future role of GenAI in education, noting that they expect their concerns to materialise.

Generative AI feels like a catalyst for educational change, much like the recent pandemic was also a catalyst for technology change and technology adoption. Attempts to block or detect generative AI use

are, in my opinion, unlikely to be successful and therefore not worth considering. Instead, we need to focus on shaping the use of generative AI. – *Director of IT, Independent School (early years to further education)*

The following section outlines respondents' expectations and predictions for how the role of GenAI technology in education will evolve in the future focusing on technological advancements, societal adoption of GenAI, and the evolution of GenAI in education.

GenAI technological advancements

Respondents anticipate that GenAI technology will continue to improve in its performance and capability. There was a sense that it will get “more intelligent” and “sophisticated”, particularly in terms of its ability to understand human emotions.

Respondents also noted that GenAI will be increasingly integrated into existing digital tools and platforms, with some citing Microsoft Copilot as an example of this. A few noted that the number of developers in GenAI may increase, with a likely influx of GenAI providers, platforms and tools.

In my opinion, the embedding of generative AI into ways of work is inevitable especially given the soon-to-be-released integration of GPT-4 into MS Office and Bard into Google Suite. All works produced will likely be wholly/partly AI-generated or AI-supported. – *Director of Digital Education, University*

GenAI use in society

Some respondents expected that adoption of GenAI technology and platforms will expand across society, gradually becoming ubiquitous in everyday life. A few felt that, as a society, we will become increasingly reliant on GenAI, which will be used to automate mundane tasks.

Many noted that current jobs will change as GenAI is more widely adopted into the workplace. Respondents emphasised the importance of adapting education to better prepare students for a GenAI-enabled future.

Businesses need to consider how they will develop skills. Reskilling is vital to prevent large scale worker displacement - AI will create some jobs and eradicate others. It's imperative that we empower those that could be displaced by AI to have the options of new careers, and that is only attainable through reskilling. – *Head of Policy and Public Affairs, Independent training provider*

GenAI use in education

Most respondents felt that GenAI will increasingly be used in education and drew parallels to other digital tools in education including Google and Wikipedia. Optimistic respondents envisaged a future where teachers use GenAI as a “classroom assistant” to support them in a range of ways, including creating curriculum content, monitoring pupil engagement, and delivering one-to-one support to pupils during a lesson. There was a strong desire for AI to support (but not replace) teachers, with great emphasis placed on the continued importance of the human teacher role.

Respondents also envisage GenAI helping to deliver personalised teaching to learners in the future. Many expect widespread pupil and student use of GenAI and raised concerns that academic malpractice due to GenAI will become increasingly hard to detect.

Some respondents anticipate that aspects of the education system may evolve as a result of GenAI, including changes to pedagogical practice, the curriculum, and assessment. Others felt that the potential impact of GenAI on education has been “hyped” and that, in practice, its impact would likely be less significant than expected. A few respondents were pessimistic about the future of GenAI in education, predicting that it will ultimately have a negative impact on learning and teaching.

Conclusion

It should be restated that the sample of respondents to the Call for Evidence was self-selecting, comprised of those who responded to an open call. As such, the composition of the sample and this summary of responses does not, and is not intended to, represent a balanced and comprehensive view of the perspectives or experiences of the sector and relevant stakeholder groups.

Some key conclusions may still be drawn from the responses to the Call for Evidence. The opportunity for GenAI to support teachers and free up their time is already being realised, as teachers experiment with using GenAI to create educational resources, plan lessons, streamline administrative tasks and better support SEND and EAL students. Most respondents were optimistic about the use of GenAI in education in the future, and felt this technology has significant potential to improve education.

However, there was widespread recognition of the challenges and risks GenAI presents for education. Increased academic misconduct, pupil over-reliance on AI, and data security and privacy issues were prominent concerns. There was a clear appetite among respondents for support and intervention to manage and mitigate these risks.

More research is needed to inform and shape GenAI use in education. The department will continue to engage with the sector and actively build evidence and policy to support safe, effective and ethical use of GenAI and AI technology in education.

Annex A: Respondent profile

The total number of respondents to the Call for Evidence in the consultation period was:

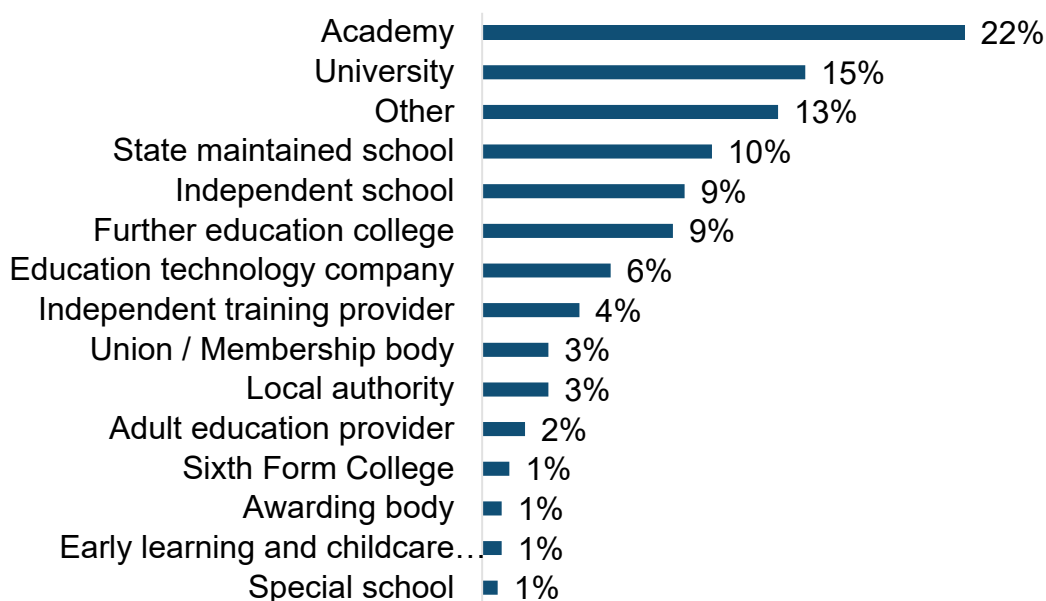
- Online portal: 552
- Email: 15

Geographic breakdown: 80% of responses were from the UK and the remainder split between various international countries. This included the USA, Hong Kong, India, Indonesia, Oman, Austria, among others. Some international responses were from organisations that operate across jurisdictions, including in England and abroad.

Location	Count
England	439
Unknown	80
International	33
Scotland	7
Wales	5
Northern Ireland	3
Total	567

Institution or organisation type: The highest number of responses was from those in Academies (124), followed by HEIs (83). 52 responses were from independent schools, which also included some international independent schools. The “Other” category included think tanks, charities and non-profit organisations, and independent education consultants.

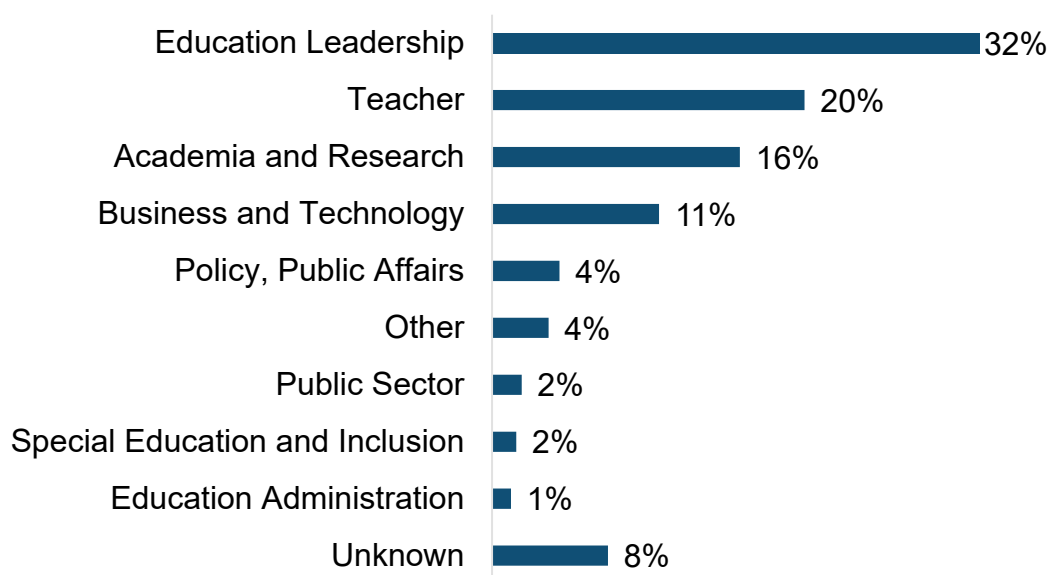
Figure 1. “Type of organisation or institution you work for or represent”



Source: DfE Generative AI Call for Evidence (n=567)

Respondent role: A third of responses (181) were from leadership positions in schools, including headteachers and assistant headteachers, heads of departments, as well as governors. 116 responses were from those in teacher roles, including classroom teachers. 8% of respondents did not state their role.

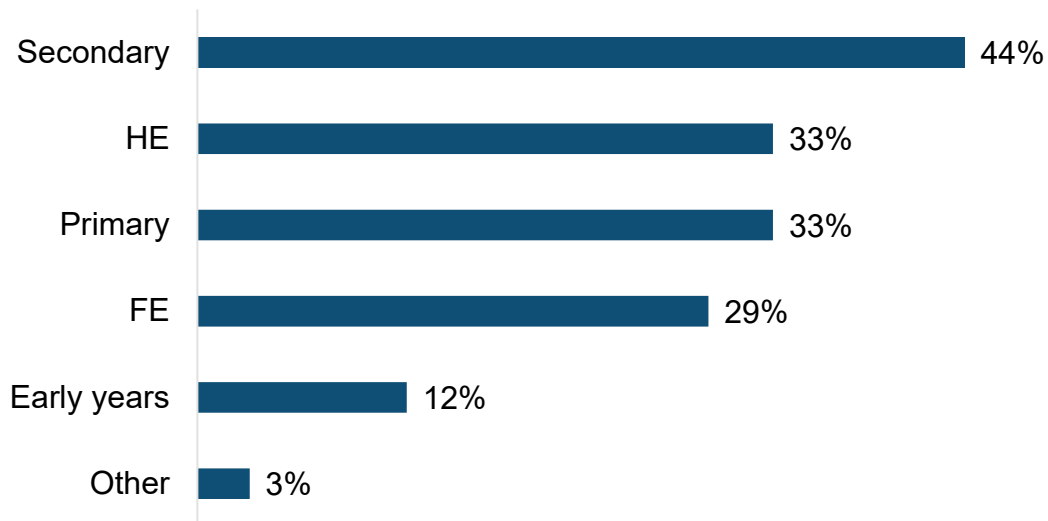
Figure 2. “Your current job title or role”



Source: DfE Generative AI Call for Evidence (n=567)

Educational phase: Over two fifths of respondents indicated they worked in secondary education (234). There were similar levels of representation from primary, further education (FE) and higher education (HE). There were fewer respondents from early years (63) compared to other education stages. Respondents could select multiple educational phases relating to their role or institution.

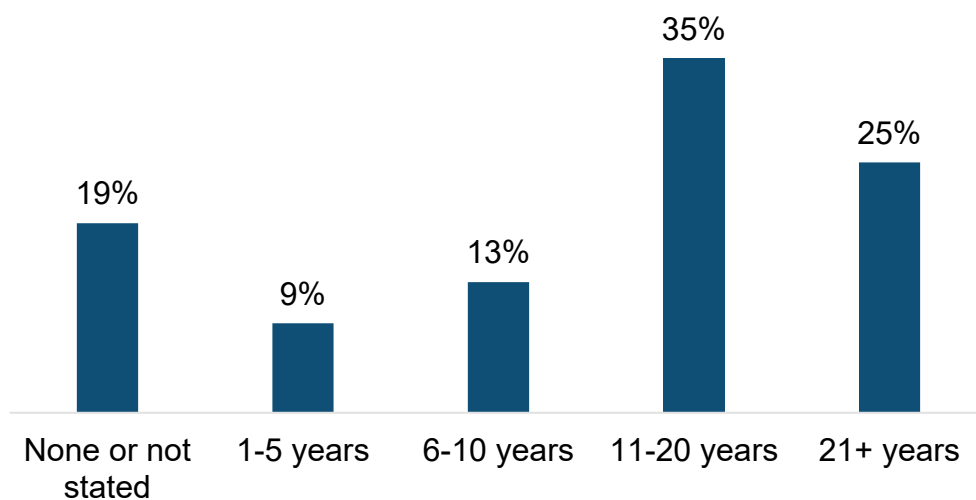
Figure 3. “What phase of education do you work in? (if applicable)”



Source: DfE Generative AI Call for Evidence (n=528, 38 unknown)

Education experience: A majority of respondents (338) stated that they had over 10 years of teaching experience.

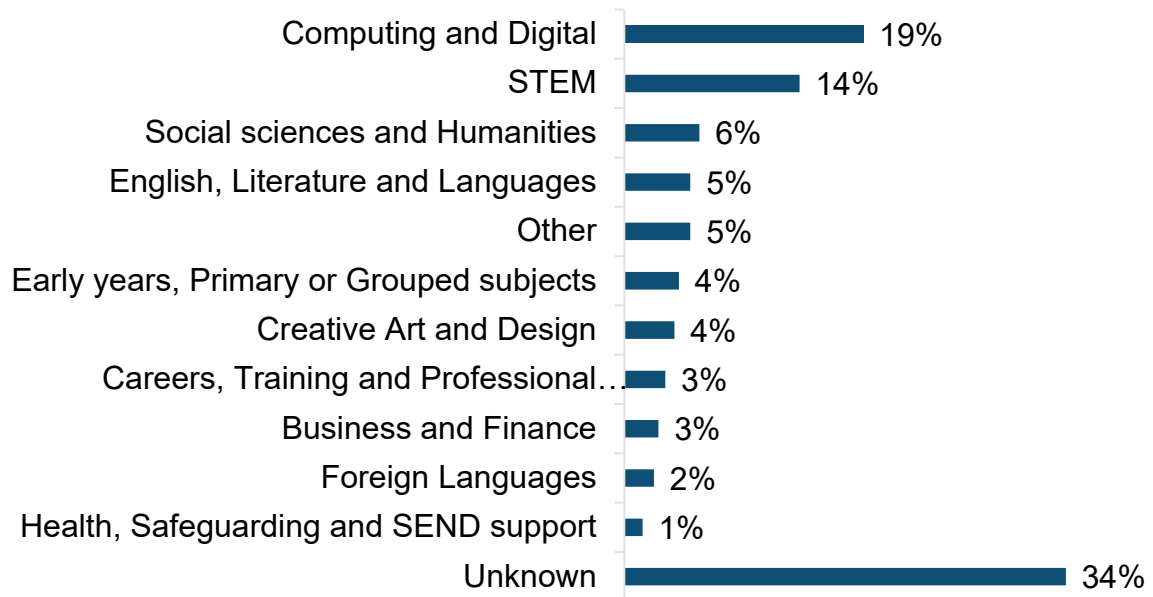
Figure 4. “Please indicate approximately how many years have you been a teacher (if applicable)”



Source: DfE Generative AI Call for Evidence (n=567)

Field or subject areas: Two thirds of respondents provided data on their subject specialism, and this showed a broad range of responses. Computing and Digital, and Science, Engineering, Technology and Mathematics (STEM) were heavily represented. Only 2% of respondents had a background in health, safeguarding and SEND.

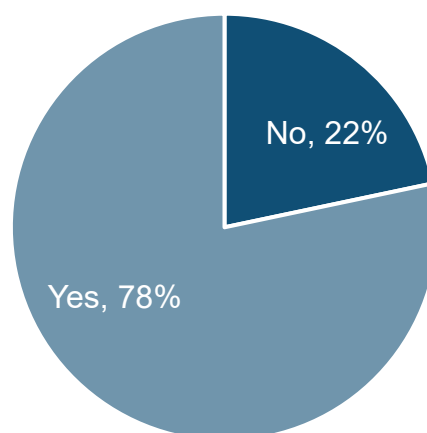
Figure 5. Field or subject area of respondents



Source: DfE Generative AI Call for Evidence (n=567)

GenAI adoption: A majority of respondents (444) had used GenAI tools for education or were aware of others at their institution who have used GenAI.

Figure 6. “Have you or your institution used generative AI in an educational setting?”



Source: DfE Generative AI Call for Evidence (n=567)

Annex B: Case studies

Case Study 1: Bolton College

Bolton College is a further education college located in Greater Manchester. The college has been prototyping their own tools that integrate GenAI technology.

Applications

- **Assessment:** The College has developed an online formative assessment platform called FirstPass which supports students with real-time feedback as they respond to open-ended questions that have been set by their teachers. The platform uses LLMs including OpenAI's ChatGPT and AI21.
- **Digital assistant:** Since 2017 the College has used a digital assistant called Ada. Prototypes have been developed to enable the Ada service to use LLMs (notably OpenAI's ChatGPT) as it responds to day-to-day questions from teachers, students and support teams.

To ensure compliance with the institution's data protection policies and GDPR, Bolton College is not using institutional datasets with external GenAI tools.

Impact

The ChatGPT-enhanced Ada chatbot launched in September 2023, and the college are monitoring adoption and the impact of use. It is expected to lead to an increase in the number of teachers setting up subject specific chatbots. These will enable students to tailor course content for research or revision and to retrieve information from their own uploaded class notes.

All subjects will benefit from generative AI. The technology that underpins generative AI will no doubt be as pervasive as the World Wide Web, so it will invariably support the delivery of all subjects that are taught in our schools and colleges. – *Learning Technology Manager*

Case Study 2: Hasmonean High School for Girls

Hasmonean High School for Girls is a secondary school in North West London.

Applications

Applications amongst teachers include creating lesson resources (e.g. games, worksheets, and revision materials such as multiple choice questions and flash cards) and translating materials for EAL students. Administrative applications including writing letters to staff and parents.

Impact

Teachers at the school report saving time by being able to quickly create high quality materials and differentiate content to pupils needs. GenAI has also supported neurodiverse pupils and students who find it a helpful aid for starting a new task. Report writing has benefitted from GenAI as teachers use it to generate a first draft and can then spend more time editing. As a result, teachers have been able to give more reflective, in-depth feedback to students.

Challenges

Academic malpractice in assessed coursework has been a challenge to manage. Some teachers report a sudden change in students' essay styles, indicating plagiarism. Hasmonean High School for Girls is aiming to develop training to support appropriate pupil use of GenAI tools, as well as investing in plagiarism software to detect academic malpractice. It is important for teachers to proofread AI-generated material carefully to check that tenses and pronouns are appropriate for the context, such as in reports.

Many students, especially those with struggles such as ADHD and ASC, find using AI really helpful as it helps to get them started. We have reviewed with our students the inaccuracies and the need to check every source as sometimes the content is literally made up, but they are starting to use it well. We have acknowledged the need to train students in its use at the start of every year so that they can use it as a tool to improve and learn rather than to cheat. – *Head of Science*

Case Study 3: Academies Enterprise Trust

The Academies Enterprise Trust (AET) is a multi-academy educational charity sponsoring 57 primary, secondary and special schools in England.

Application

Both pupils and staff are using GenAI tools. Canva is the most widely used tool, having been rolled out across all institutions. Google Bard has been made available to a small group of staff who are experimenting with generating lesson content, letters and emails, as well as using it as a personalised learning coach for GCSE Maths.

Impact

Canva is being used by 4,500 pupils and staff across AET. Example applications include staff using AI-generated images as talking points, and pupils using it to create digital artwork. AET are not formally measuring the impact of Canva today, but are implementing mechanisms to measure the impact of it and other platforms over the course of this year.

Scaling use

To support the new intake of trainee teachers, AET plans to run introductory sessions with Canva, as well as AI training sessions.

When considering new AI tools, the Trust conducts a Data Protection Impact Assessment, and (if approved) access can then be enabled by IT. Headteachers at AET's institutions can request for tools to be "switched on" for their staff – for example, Google Bard is available for some staff, but has been blocked for students.

AI has also massively helped to reduce workload for staff by generating exemplars, templates and presentation content as a starting point to adapt, as well as using features like column stats in spreadsheets to quickly access and interpret data. – *Academic Technologies Lead*



Department
for Education

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