

Embracing AI in the classroom

Damian Maher

Although artificial intelligence (AI) has been around since the mid 60s, it is now transforming various sectors, including education. As teachers, understanding how AI can support student learning and addressing the ethical issues surrounding its use is crucial. While teachers are starting to explore the use of AI to support their teaching, to date the use of AI to support students' learning has been limited in Australia due to ethical concerns. AI has been trialled in South Australia and New South Wales. As yet, no reports or publications have been produced from these trials. This article provides an overview of ways AI's can be used to enhance student learning while maintaining ethical integrity.

Understanding AI in education

This article focuses on GenAI, which is a type of AI that generates images, text, videos, and other media in response to inputted prompts. ChatGPT and DALL-E2 are some of the more common platforms at the moment although AI is increasingly being embedded into platforms such as Word, Google Docs etc. AI in education encompasses a wide range of applications, from personalised learning and intelligent tutoring systems which can support students' learning both in the classroom and at home. These tools can significantly enhance the learning experiences of students by providing tailored educational content through identifying areas where students need more support. One way this can be achieved is by using personalised learning.

Personalised learning

One of the most significant advantages of AI in education is its ability to personalise learning experiences. AI algorithms can analyse a

student's performance and preferences to create customised learning. For instance, adaptive learning platforms like DreamBox and Knewton Alta can adjust the difficulty of tasks in real time based on the student's progress. Khan Academy has released an AI tool called Khanmigo which provides individualised support for students. This tool does not provide answers directly to students but instead asks them Socratic questions and in doing so, supports their thinking processes. Additionally, personalised learning provides opportunities for students to learn at their own pace, giving them the time they need to fully understand a topic before moving on. This flexibility can reduce stress and anxiety, particularly for students who may struggle with a traditional, one-size-fits-all approach.

Personalised learning can accommodate a wide range of learning needs, including those of students with writing difficulties, language needs, or other aspects that impact on learning outcomes. Adaptive technologies can provide the necessary support to ensure all students have equal opportunities to succeed. An example is where AI can support students with writing challenges. There are a range of editing tools to support students' writing including Grammarly and Quillbot for students who can write independently but struggle with aspects such as spelling, grammar etc. A feature of these tools is that they provide students with immediate feedback and error correction. Additionally, many writing apps such as Microsoft Word and Google Docs now come with built in editing tools, which means students do not need to purchase additional software.

Other software such as Jenni.ai and Perplexity.ai can support students who are experiencing challenges in formulating ideas and collating new information. These AI text generators can provide the support required for students to participate in classroom-based writing activities alongside their peers. They also allow students to work independently at home. An example of Jenni.ai is that it builds text based on the student's prompt and creates the text sentence-by-sentence, thereby requiring the student to read and consider each sentence before proceeding. 'This sentence-by-sentence approach also allows students to adjust the direction of the text relevant to their desired writing goal.' (Young & Maher, 2023, p. 126).

With personalised learning, AI systems can more easily identify areas where students are struggling, and provide targeted support and interventions. This proactive approach can prevent small issues from becoming significant obstacles to learning. AI systems facilitate this through the collection of student data which allows for the analysis of data on student performance, providing valuable insights for educators. This data can inform instructional strategies, curriculum development, and educational policy decisions. This fits in with the current focus of data-informed practice and is supported by research. In a review by international education experts, a consistent finding was that the best systems all use effective assessment and data to drive improvement: systems cannot improve what they do not measure (McKinsey & Company 2007).

Critical and creative thinking skills

Another way that AI can support student learning is to develop critical thinking and creative thinking skills. This is a component of the Australian Framework for Generative Artificial Intelligence in Schools. It sits under Principle 1: Teaching and Learning, and focuses on ways generative AI tools are used in ways that support and enhance critical thinking and creativity, rather than restrict human thought and experience.

AI-powered platforms can present problems and scenarios that require critical thinking, adjusting the complexity based on the student's progress. These platforms can challenge students with tasks that require analysis, synthesis, and evaluation, which are essential components of critical thinking. AI can create realistic simulations and scenarios where students must apply their critical thinking skills to solve problems. For example, virtual labs, historical reenactments, and business simulations can provide immersive experiences that require thoughtful decision making and analysis.

In relation to creativity, AI-powered tools can assist in brainstorming sessions by generating ideas based on given prompts. These tools can provide diverse perspectives, helping students explore various creative solutions. AI can support creative writing by offering suggestions for plot

development, character creation, and dialogue. Tools like AI-driven writing assistants can help students refine their writing style, experiment with different genres, and overcome writer's block. AI can provide advanced tools for digital art and design, allowing students to experiment with different styles, techniques, and mediums. AI-powered software can suggest colour palettes, design layouts, and even generate artwork based on user inputs, inspiring students to push their creative boundaries. AI can also aid in music composition by generating melodies, harmonies, and rhythms based on the student's input. These tools can help students experiment with different musical styles and structures, enhancing their creativity in composing original pieces.

Ethical considerations in AI use

While there are benefits of AI use to support student learning, it is essential to consider the ethical implications of its use. As AI becomes more integrated into the classroom and home use, students, parents, and teachers must navigate issues related to privacy, data security, bias, and the digital divide.

AI systems often rely on vast amounts of data to function effectively. This data can include sensitive information about students, such as their academic performance, behaviour, and even biometric data. Protecting this data is paramount. Educators and parents should ensure that the AI tools they use comply with the Australian Framework for Generative Artificial Intelligence in Schools (Commonwealth of Australia, 2023). Section 6 of this framework states students and others using generative AI tools have their privacy and data protected.

Bias is an issue in using AI tools. AI systems are only as unbiased as the data they are trained on. If the training data contains biases, the AI system will likely perpetuate those biases. For example, if an AI grading system is trained on essays predominantly written by students from a particular demographic, it may not fairly assess essays or importantly, support student understanding from students from different backgrounds. As noted by Kathryn MacCallum and David Pearsons in a recent *Conversation*

article, AI use has raised concerns about fairness. As AI tools consume quantities of unfiltered data, the risk is they will reinforce existing biases in this data, perpetuating gender stereotypes and other negative outcomes. For people from Indigenous cultures, AI provides both opportunities and threats.

As AI becomes more prevalent in education, fostering digital literacy among students is essential. Students need to understand how AI works, its benefits, and its limitations. This includes them understanding about data privacy, ethical considerations, and the importance of critical thinking when interacting with AI systems. By equipping students with this knowledge, they can be empowered to use AI responsibly and effectively.

Not all students have equal access to the technology required to benefit from AI-enhanced learning. This digital divide can exacerbate existing educational inequalities. Schools must work to ensure that all students have access to the necessary devices and internet connectivity. This might involve providing laptops or tablets to students in need or creating programs to support families in securing affordable internet access.

A limitation in providing increased opportunities for students to learn with and from AI systems is that teachers have fewer opportunities to engage with students and understand their learning needs. This notion raises the importance of teacher-student relationships. Many educators and researchers have noted the importance of this relationship (e.g., Maher, forthcoming).

One of the outcomes of positive teacher-student relationships is that they can support student wellbeing. In order to provide such support, it is important that teachers are able to identify factors that may be negatively impacting students' wellbeing and put in place strategies to support them. This is particularly important in the current climate, where the impacts of COVID-19 continue to affect some students. If AI replaces interactions teachers have with students, the opportunities to support their wellbeing decreases. The notion of wellbeing is covered under Australian Framework for Generative Artificial Intelligence in Schools. It sits under Principal 2: Human and Social Wellbeing: Generative AI tools are used to

benefit all members of the school community. The impacts of wellbeing related to effects on human contact are not covered in the framework.

AI has the potential to impact education by providing personalised learning experiences for students and to support their critical and creative thinking skills. AI is also able to support students from diverse backgrounds. However, it is crucial to address the ethical considerations associated with AI use, including privacy, data security, bias, and the digital divide. GenAI is currently evolving at a rapid pace. It is important that students are provided with opportunities to use this technology in ways that support their learning.

—

Dr Damian Maher is a senior lecturer in Education within the Faculty of Arts and Social Sciences at the University of Technology Sydney. Damian's research is focused on the use of educational technologies from kindergarten through to the tertiary level. His current research in this field examines how artificial intelligence is being used by school teachers and how it can support pre-service teachers.

References

Commonwealth of Australia. (2023). Australian Framework for Generative Artificial Intelligence in Schools.

MacCallum, K., & Parsons, D. (June, 2024). AI tutors could be coming to the classroom —but who taught the tutor, and should you trust them? *The Conversation*.

Maher, D. (forthcoming). Chatbots in schools: opportunities and considerations. In S. Papadakis & G. Lampropoulos (Eds.), *Social Robots and Artificial Intelligence in Education*. Springer.

McKinsey & Company (2007). How the world's best-performing systems came out on top. Report prepared by M Barber & M Mourshed.

Young, K., & Maher, D. (2023). Generative AI technology to support high school students experiencing writing challenges. In, R. E. Ferdig, R. Hartshorne, E. Baumgartner, R.

Kaplan-Rakowski & C. Mouza, (Eds). *What PreK-12 teachers Should Know About*

Educational Technology in 2023: A Research-to-Practice Anthology. AACE2023.