SUBMISSION

Submission to the House Standing Committee on Employment, Education and Training

Submission to the inquiry into the use of generative artificial intelligence in the Australian education system

14 July 2023

The Australian Academy of Technological Sciences and Engineering (ATSE) is a Learned Academy of independent, non-political experts helping Australians understand and use technology to solve complex problems. Bringing together Australia's leading thinkers in applied science, technology and engineering, ATSE provides impartial, practical and evidence-based advice on how to achieve sustainable solutions and advance prosperity.

Generative Artificial Intelligence[1] (AI) has the power to significantly transform the way we work, learn and live. Generative AI tools currently available to the public reflect the start of an AI revolution that, if properly managed, will lead to powerful tools to help educators across the entire education system, from primary education through to higher education, reduce their workload and motivate students to improve their learning. Generative AI may help educators to provide more comprehensive feedback, develop lesson plans, automate time consuming administrative tasks and improve assessment practices (Swiecki et al. 2022).

Given the novelty and possible risks of these systems, it is understandable that many educators and administrators have responded with trepidation. It is important that educational institutions properly consider how generative AI may impact student wellbeing, teaching, learning, assessment and administrative practices, and how to develop appropriate settings to get the greatest benefit from these emerging systems. It is equally important to acknowledge that these systems are already in use by both teachers and students. Responses such as banning generative AI systems in public schools[2] are impractical and likely impossible to enforce, do a disservice to students and teachers, and will exacerbate the existing resourcing divide between public and private education. ATSE strongly urges against creating an AI divide that preserves the potential benefits of AI in education to a select few. Australian teachers and students, from primary school through to higher education, must learn how to engage with generative AI ethically and constructively to navigate the society and employment landscape of the future.

Generative AI is more convincingly human than any other technology or software system previously. As its sophistication increases there is a growing risk that generative AI tools are interacting conversationally with users around mental health and wellbeing. Appropriate human-led interventions will need to be in place to minimise harm from these interactions.

ATSE contributed to the National Science and Technology Council's recent rapid report on generative AI (Bell et al. 2023). This submission further explores the need for regulation and policy for generative AI in education systems. To help students and educators to get the most out of the generative AI revolution, ATSE makes the following recommendations:

Recommendation 1: Reverse bans on generative AI systems in schools introduced by state education departments and establish institutional access licencing agreements across the education sector.

Recommendation 2: Introduce age-appropriate AI instruction in Australian classrooms, supported by appropriate educator training and purpose-built AI tools or institutional access licences for commercial AI products.

Recommendation 3: Provide professional development opportunities, supported by professional development leave and other incentives, to teach existing educators how to engage with AI both inside and outside the classroom.

Recommendation 4: Require the inclusion of AI literacy training as part of initial teacher training programs.

Recommendation 5: Encourage the development of assessment guidance by education departments that is both resilient to AI developments and embraces opportunities presented by AI.

Recommendation 6: Develop and provide ethics and AI data privacy training for educators.

Recommendation 7: Develop appropriate interventions to protect young people's mental health, and deeply sensitive information.

Allowing students to embrace generative AI

Generative AI, and AI more generally, has the potential to be the next big technological leap forward, changing the way we live and work on a level on par with that of the internet. In the same way that digital tools provided new opportunities for teaching and learning through online education and integrated digital

[1] Defined as algorithms that can produce text, imagery and sounds with relatively low levels of human intervention (Longoni et al. 21 June 2022).
[2] As has happened in New South Wales, Queensland, Tasmania, Victoria and Western Australia (Jaeger 1 February 2023).

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technologies in classrooms, generative AI could transform learning and teaching in Australia. AI may help students to learn concepts, answer questions that they do not feel comfortable asking teachers and overcome mental blocks (Liu et al. 2023). There is emerging evidence that students and teachers are already using generative AI tools to support their learning and consolidate concepts (Harper 5 June 2023). Today's students will also need to be equipped with AI literacy to fully participate in the workforce of tomorrow, enabling productivity gains for the Australian economy into the future.

Knee-jerk bans on generative AI systems in public have the potential to produce an AI divide. If private and independent schools can teach their teachers and students how to get the most out of AI systems, while this is banned in the public system, two tiers of digital literacy will emerge. This will impact students beyond the primary and secondary school systems, putting public school graduates behind when they enter the workforce or further education. This two-tiered system will disproportionally impact those from disadvantaged backgrounds, with public students more than twice as likely to come from a disadvantaged background[3], further entrenching their disadvantage. It must not be the case that only wealthy students from private schools are given the opportunity to develop AI literacy and gain the advantages that come with that.

The fee-for-features model of many of the most popular generative AI services, where key features or priority processing is placed behind a paywall also has the potential to exacerbate inequalities in education. Schools and higher education providers will need to explore acquiring institutional licences for these products that can enable an equality of access for their students. Alternatively, education departments or higher education providers could develop their own generative AI tools using the GPT-4[4] (or similar generative AI models) Application Programming Interface (API) to create a custom environment specifically designed for learning and teaching (for example, the Khanmigo AI-powered learning system). Governments may also wish to consider providing access to more sophisticated existing US models, with the addition of gateways for the purposes of auditing student behaviour, and allowing teachers to access and monitor channels.

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Using AI to improve pedagogy and the curriculum

Allowing generative AI in schools may help to establish more personalised teaching methods and real-time feedback that would otherwise be impractical in a traditional classroom. For example, the University of Queensland is already embracing this through their RiPPLE tool that leverages both crowd sourcing and AI systems to develop and recommend learning resources to make learning more personalised and engaging (University of Queensland n.d.). To ensure that these educational opportunities can be seized, educators and administrators should be supported to feel confident in employing this technology in their classrooms and on their campuses. Professional development opportunities need to be created and encouraged, with appropriate time off and incentives to encourage and support educators to engage with this new technology and implement it to enhance their learning and teaching activities. For the near future, ongoing professional development will be required each year to ensure educators are able to adapt their teaching practice to the changing technology as it matures.

Beyond the opportunities in the classroom, AI has the potential to completely change the way we work and live. It is vital that we not only prepare students for this, but give them - and by extension, the nation - a competitive advantage by training the next generation of AI leaders who can both use and improve AI to build a stronger nation. Students will need a firm foundation of knowledge in how AI systems work and how they can be used, requiring that these skills be integrated within the curriculum, at all education levels. Current content on programming and coding within the Australian Curriculum, needs to be supplemented with specific AI education. Grok Academy is one example of a program already working to integrate digital and AI skills into classrooms and provides free support for Australian teachers with teaching digital

[3] 45.0% of public students come from a disadvantaged background vs. 19.9% for private school students (Cobbold 2021)

[4] Generative Pre-trained Transformer 4 – the large language model on which OpenAI's ChatGPT is based.

technologies. Higher education providers, similarly, need to integrate AI skills and competencies across all courses as a core component of the curriculum. Crucially, the curriculum needs to reflect the rapid future development of AI tools and equip students with the skills they need to respond flexibly as these tools continue to develop and improve, while teaching students to make the most of the tools already available. This will empower Australian students to become the next generation of AI leaders, developing and embracing future generations of AI technologies.

Recommendation 3: Provide professional development opportunities, supported by professional development leave and other incentives, to teach existing educators how to engage with AI both inside and outside the classroom.

Recommendation 4: Require the inclusion of AI literacy training as part of initial teacher training programs.

Managing assessments in the age of generative AI

The inclusion of generative AI within education systems will require rethinking of how assessments are conducted, presenting an opportunity to improve assessment practices. Educators have raised concerns that the rise of generative AI will lead to increased cheating and plagiarism and reduce the validity of assessment items. One solution is to take an archaic approach by returning assessments to supervised pen and paper examinations or oral examinations, that exclude the possibility of using AI systems. While this may be appealing and have a role in certain situations, this approach alone will likely fail to meet the needs of many students, rolling back many of the positive changes (like online learning) that have helped expand access to education, and would miss an opportunity to embrace this technological revolution. Instead, education providers should be supported to embrace and resource multiple forms of assessments for key learning outcomes, providing multiple opportunities and multiple methods of assessing student's knowledge and abilities. Research shows that assessments that relate to authentic tasks, apply knowledge in a realistic context, and emphasise and assess a range of skills, are perceived by students to have long-term benefits and are reasonable in their demands as being positive for their learning (Struyven et al. 2006). The types of assessments to which generative AI systems may pose academic integrity risks (e.g. essays and traditional examinations) have previously received criticism for being poor measures of a students' knowledge and abilities (Rudolph et al. 2023). This presents an opportunity to reevaluate how Australian educational institutions at all levels can redesign assessments to allow them to not only survive in the AI age, but also work better to promote deep understanding and learning in Australian students.

While aspects of assessments will need to be managed during the emerging AI revolution, generative AI, and AI more generally, has the opportunity to enhance formative assessment. Generative AI can help to provide real-time feedback for students on a scale not otherwise practical in a classroom and may also help educators to provide more detailed and useful feedback on assessments. The Productivity Commission has found that for every four hours a schoolteacher spends teaching, they spend one hour marking (Productivity Commission 2023), while markers in higher education are often paid on piece rates that understate the time taken to mark assessments (Schneiders 14 April 2023). These tools should therefore be embraced to help educators reduce workloads and provide an enhanced educational experience for students. Support and guidance will be needed to do this, including comprehensive guidelines around how AI can be ethically and productively used to improve assessment mechanisms and assessment feedback.

Recommendation 5: Encourage the development of assessment guidance by education departments that is both resilient to AI developments and embraces opportunities presented by AI.

Managing data privacy and student safety concerns

The widespread use of generative AI, particularly around student learning and performance also raises concerns around data privacy. These concerns include privacy of the underlying data upon which AI applications are trained, but also concerns around the use of information entered into these systems, particularly for AI systems that could help to provide educators feedback on how students are faring. Data privacy more broadly will be addressed by the ongoing consultation into the safe and responsible use of AI being conducted by the Department of Industry, Science and Resources, to which ATSE will be making a submission. Australian student data (such as contact details or grades) is currently stored internationally (for example via Google Classrooms), but given the nature of generative AI and emerging interaction patterns, the risk that very personal and potentially more risky data is stored about Australian students offshore is real and growing.

Privacy approaches differ across Australian jurisdictions, and internationally. These should be aligned domestically to take a unified approach for Australian education, with consideration for student data locality requirements. Student data is high risk, and schools are already using international systems, including generative AI – so clarity and consistency in communication to schools nationally is crucial. Currently most generative AI models have a stated 18+ age restriction on accounts, signalling an awareness by their creators of the potential risks to children.

ATSE hopes that the DISR consultation will lead to enforceable data privacy standards that will help to regulate the use of training and user-inputted data in AI systems. Regardless of the outcome of this consultation process, educators will need to understand how to ethically and responsibly use AI systems to manage these data privacy concerns. Education departments should work with regulators to provide appropriate guidance and training for educators as the technology develops.

As generative AI becomes increasingly sophisticated, it will be more difficult to ensure student interactions are focused on the intended learning area. There is an emerging risk that generative AI tools are interacting conversationally with users around mental health and wellbeing. This leads to risks that students may be encouraged to talk to an AI system rather than a human. While for some students discussing mental health issues with an AI may make them more comfortable to seek help for mental health issues, some students may be less likely to access timely interventions, might receive poor advice, or mental ill health may even be exacerbated by such interactions. Systems with high levels of human intervention will still be necessary to identify students at risk and intervene swiftly and appropriately.

Recommendation 6: Develop and provide ethics and AI data privacy training for educators.

Recommendation 7: Develop appropriate interventions to protect young people's mental health, and deeply sensitive information.

ATSE thanks the House Standing Committee on Employment, Education and Training for the opportunity to respond to the inquiry into the use of generative artificial intelligence in the Australian education system. For further information, please contact academypolicyteam@atse.org.au.

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