

## Queensland University of Technology response to the House of Representatives Standing Committee on Employment, Education and Training Inquiry into the use of generative artificial intelligence in the Australian education system

QUT welcomes the opportunity to comment on the issues and opportunities presented by generative Artificial Intelligence (AI), including the current and future impacts on Australia's early childhood education, schools, and higher education sectors. Our comments are aligned with the Inquiry's terms of reference.

# 1. The strengths and benefits of generative AI tools for children, students, educators and systems and the ways in which they can be used to improve education outcomes

## Ways of learning

Interacting with generative AI provides a different, more conversational approach to searching online. It builds on work in searching to learn, supports knowledge creation practices and (if supported appropriately) can support critical thinking and evaluation. It can provide personalised instruction and learning efficiencies; explain concepts in more than one way and in varying detail; and aid just-in-time learning anywhere, anytime.

## Learning to code and program

The use of generative AI may be particularly useful as a tool for learning to code and program – and this is already being incorporated into practice in these professions. The Technologies Curriculum that has been implemented since 2016 required many teachers to undertake professional learning in this field and requires students to learn to program in multiple languages by the end of Year 8. Generative AI could be an effective tool to support primary and secondary teachers in their classroom practice.

## Digital and data literacy

Generative AI tools (such as Chat GPT or Midjourney) are effective examples to be able to teach data science and computer science concepts and tools such as large language models (LLMs). They are also useful to demonstrate the different meanings of terms, such as risk, and predictions that are used in different ways in different disciplines.

## Support for teaching

As in many other fields, there is potential for generative AI tools to do some of the more routine work of educators. This could be for design or planning (such as platforms to create a first draft of a unit design or lesson plan), teaching (through personalised learning models that allow just-in-time interactions with students and the provision of feedback) or assessment (although privacy should be considered).

# 2. The future impact generative AI tools will have on teaching and assessment practices in all education sectors, the role of educators, and the education workforce generally

## Listening to educators

There is significant work needed to talk to educators about how they are using generative AI in their practice to collect stories of best practice and to document what has not worked. This should then be shared in a way that is accessible and promotes further interdisciplinary and transdisciplinary approaches to research about the impact of generative AI on education with implications for policy and practice. This is particularly relevant for assessment practices, which will need considerable rethinking on a continuous basis, as AI tools are continuously changing and improving.

## Helping people learn

Generative AI could be used to support collaboration, interaction, the creation of visualisations, and communication. Generative AI can build on the work done in personalised learning and learning sciences research. Learning sciences research takes an interdisciplinary approach to working with the end users to decide how best the technologies can support teachers and learners. Greater emphasis will need to be placed on skills such as critical and creative thinking to be able to interrogate what AI has produced. There will be a need to develop students' skills in using AI tools effectively (just like we already do with practices like using search engines effectively).

## Far reaching impacts of generative AI on education practice

These impacts apply to all aspects of education practice. There will be an impact on the design of learning tasks: for example, modelling the effective use of generative AI tools for the particular discipline such as an AI generated lesson plan for preservice teachers or AI generated code for programmers and asking students to critique the examples. The design of assessment tasks will also be affected (as discussed in further detail below). Educators need to ask the question – if AI can generate the answers, then why do students need to also demonstrate they know the answers? This therefore has the potential to change how learning itself occurs. Education systems will also need to adapt in response to the use of generative AI. One example of this is to consider how we will take the use of generative AI into account in systems that relate to transitions – such as senior schooling or university – and determining the role for these institutions in confirming that standards and outcomes that are valuable have been achieved.

## Provision of feedback

The use of generative AI could influence the way educators give summative and formative feedback to students. Some of the considerations include data privacy (students should be given the option to agree to their work becoming part of the data on which the LLMs draw),

the impact of this on the LLM outputs including for those tools that are aimed at academic integrity if non-finalised work is entered as data, and the implications for students on connection with educators when given feedback from generative AI tools. These are areas that will require further research.

#### Acknowledging contributions to learning

Using generative AI tools can support establishing practices of acknowledgement of contributions. Some examples can draw on the practices of journals (Nature, Science, AJET) which is to ask for authors to describe in what way generative AI has been used in the creation of the work (for example, for final checking, idea generation, etc.). More specifically, students could be asked to include their use of generative AI in the reference list, including the prompt that they used. It is important to recognise that this would necessarily incorporate a reliance on trust, as it would not be independently verifiable.

#### Workforce implications

The education workforce requires deep engagement with design, understanding of AI, and the implications of policy changes. This needs leadership and regulations around the use of generative AI that give educators rules and guardrails within which to innovate and develop practice. In addition to the critical and creative use of generative AI tools, preparing students for the workforce will require educators to understand how AI is currently being used in professional settings as well as anticipating how it may be used in these settings in the future. Professionals are likely to look to education institutions for professional development in the effective use of AI (approaches such as micro credentialing may be useful for this).

#### Assessment

The potential for educators to use AI tools to generate learning activities and assessment tasks appears to be significant. This creates the possibility of a situation in which activities are created by the educators using AI, the learners use AI to create their responses, and the educators use AI to mark/grade and even give feedback. At its most extreme, such a scenario suggests the question of who, if anyone, has learnt anything? And what was the purpose of the assessment?

## 3. The risks and challenges presented by generative AI tools, including in ensuring their safe and ethical use and in promoting ongoing academic and research integrity

#### Learning practices

There is substantial pedagogical value to be found in the significant risk taking involved in learning without generative AI: learners often feel uncertain about a learning situation and it is precisely by overcoming this challenge that they engage and learn. The reliance on generative AI has the potential to reduce opportunities for critical thinking and problem-solving, creativity; it may promote laziness and lack of independent thought; and it may limit the development of deep knowledge. Students may lack the confidence to engage in that first step and take the essential risk on not knowing in order to further understand a topic. In addition, AI responses can be deceptively convincing, leading to an assumption that the response generated is accurate. This therefore required a deliberative approach to learning design to ensure that independent thought, critical thinking and creativity are central to the learning experience.

## Academic Integrity

The immediate reaction by education institutions and sectors has been in relation to academic integrity. This is appropriate, however it should be noted that any tools that claim to be able to automatically detect the use of generative AI in the creation of assessment submissions (e.g. text, images, videos) will need to be continually updated as the tools and accuracy of the underlying model(s) continue to improve. In addition to tools, education policies need to be developed in relation to the acceptable use of generative AI in assessment. Some regulations can be a good thing – even if it's only to help people understand how to be safe – because people are not always sure what they are and are not allowed to do. Yet, these regulations will need to be dynamic to some extent and be continuously adapted to changing contexts.

The use of AI tools can present a risk to academic integrity, similar to contract cheating and other more traditional forms of cheating that some learners may engage in. Educating students in the use of AI, in how it works and in understanding its impact in terms of their learning and integrity is the key way forward. Educators must design assessment that minimises the risk of AI tools supplanting the learner, to ensure that the learner can demonstrate mastery of the learning outcomes. The growth in detection tools is unlikely to completely ensure integrity while introducing risks to the student experience, for example, the risk of false positives that have the potential for serious detrimental impact.

## Assessment design

Changes as a reaction to academic integrity considerations will most probably result in the need for substantial assessment and task redesign. Education systems and individual institutions and processes will need to budget for the time it will take practitioners to do this work. Some of the models of assessment commonly used (for example multiple choice questions) have been adopted because educators need to be able to implement the assessment, generate marks, and provide feedback at scale and in a reasonable timeframe. If generative AI could be used to achieve different types of marking at scale then this provides us with an opportunity to consider other approaches to assessment that may better represent student learning. A risk and challenge in relation to this is that education systems including universities can be slow to change. The policies developed need to be flexible enough to adapt as the technology changes.

## Ethical data practices

There are risks associated with the data that the large language models are using. Whether this data has been acquired ethically is still being challenged, with implications for multiple considerations including privacy, copyright, structural bias, data integrity and cultural safety. Also, using data and models owned by multinationals for education and then giving our students' data to them entails inherent risk. Students should be asked for their consent to share their documents with generative AI. In many journals, they do not allow reviews to be written by generative AI because they do not have the permission of the authors to do that.

Ethics and integrity go hand in hand, but teaching students the ethical use of AI will require more than teaching them about academic integrity. Understanding the ethics would involve considering privacy, copyright, bias, misrepresentation and deception. Perhaps the use of AI tools is more about the ethics and understanding the risks than it is about technology.

## 4. How cohorts of children, students and families experiencing disadvantage can access the benefits of AI

## Models built on representative data

Education needs to ensure that generative AI tools and models that are accessed are built using data that is representative and diverse. For the most part, large language models are built on data that is from English-speaking countries. There needs to be consideration of other languages, the impact that this has on ways of thinking and framing questions. Consideration particularly needs to be given to Indigenous languages and ways of knowing, the privacy of this data, the impact on the responses generated and the potential for assessment and teaching practices to further minimise the experiences and ways of knowing of Aboriginal and Torres Strait Islander peoples. These models are also largely built using data generated from contributions to text available on the internet. This does preference the ways of writing and the opinions of mostly white, male, middle and upper class professionals. Education needs to advocate to ensure that children, students and families experiencing disadvantage have a voice and that their experiences are included in the way that generative AI produces responses.

#### Access to generative AI tools

Education needs to ensure that the gap that already exists for children, students and families experiencing disadvantage in terms of access to technology does not grow further through the growth and spread of generative AI. There are challenges in terms of access to technology, to reliable internet, and access to data. Any education that builds on the use of generative AI needs to consider support for students who cannot continue the connection with the technology when they leave the schoolhouse. This is particularly relevant considering the nation-wide bans on the use of mobile phones in schools. These bans have significant implications for students experiencing disadvantage to be able to seamlessly transition their learning with technology in and out of school.

#### Tools and platforms for the use of generative AI

Education also needs to consider the implications of age restrictions on access to generative AI tools, with most primary school students being too young to consent to using the tools. This will have consequences for the potential use of generative AI by primary school teachers for feedback or assessment. Generative AI tools require specific tools and platforms to enable interaction. An example of this is Midjourney which requires the user to have a Discord account. Current education rules around the use of interactive platforms such as this may need to be reconsidered if they are to provide students with opportunities for interaction and learning. Platforms such as Midourney also require payment for access, sometimes with subscriptions. Education institutions may wish to consider paid access to these tools in the same way they do with other tools. Otherwise, those with paid subscriptions to AI tools will have an advantage. This also raises questions around sustainability of the use of particular tools, which therefore constantly needs to be monitored.

#### Broadening accessibility

The large language models on which generative AI is built have been available for several years. The significant innovation was in the user interaction design that has made them accessible to the entire population, not just computer- and data-scientists. There are already platforms and tools that have been built, such as AI-powered tutoring (e.g.,

Khanmigo from Khan Academy) that have the potential to help students outside of formal classes to receive support that their parents/guardians may be unable to ordinarily provide. In addition, there are several tools built using generative AI that support students and professionals with grammar and tone to enhance written communication.

5. International and domestic practices and policies in response to the increased use of generative AI tools in education, including examples of best practice implementation, independent evaluation of outcomes, and lessons applicable to the Australian context

#### The Australian context

In Australia, each university decided the response to generative AI, mostly relative to questions of assessment and academic integrity, for itself, within the parameters set by the central regulator, the Tertiary Education Quality and Standards Agency (TEQSA). Within QUT, each unit coordinator was able to decide for themselves whether students would be allowed to use generative AI as part of the unit and the implications for assessment practices. Support was supplied from the Learning and Teaching Unit for academics to consider these implications. At other institutions, the decision was made centrally, and some subscribed to formal systems that were intended to check for the use of generative AI in any student submissions.

#### International practices and policies

Some examples of international responses:

- Carnegie Mellon University in the USA is considering collaborating with other universities to create their own data and large language model to support educational and research use, in order to establish an alternative to relying on commercial versions. One of the barriers to doing this is the infrastructure required for the processing;
- Singapore has created a national strategy for the inclusion of generative AI in Initial Teacher Education and also a national professional development program;
- France also has a national strategy for the use of generative AI in education.

## 6. Recommendations to manage the risks, seize the opportunities, and guide the potential development of generative AI tools including in the area of standards

#### Evidence informed decision making

We want to encourage innovative, safe practice for the use of generative AI in education. There is significant potential for generative AI tools to be used to improve education outcomes, however we currently have no research to support any decisions. Educators need to be supported to be able to make evidence-informed decisions about how generative AI can be used in their practice. Without generative AI-specific evidence, the only basis of any recommendations and discussion is prior experience with the introduction of other technologies on learning, learners, practitioners, and educational institutions and systems. There is an urgent need for investment in high quality research specific to this technology to ensure that the enormous impending changes (from ways of learning through to system processes) are informed by evidence. This needs to be ongoing as education will need to adapt relatively quickly as the applications of generative AI expand and the tools change.

Areas of priority for research:

- Learning and collaboration with generative AI
- Innovation in practice
- Impacts of generative AI on feedback and assessment
- Systems change
- Effective implementation of generative AI in teaching (for the generation of examples of best practice)
- Impacts of diversity in the data on which large language models are created on learning and teaching

#### Guiding principles for the use of generative AI in education

Al is part of our lives and so it is vital we take an educative stance to helping students to be aware of Al's limitations and implications, and to become thoughtful and purposeful users who are open to the opportunities, yet critical consumers of content generated.

Those of us in education sectors are preparing people to use generative AI as part of their practice in a variety of fields, but also future leaders and policymakers who will need to understand new developments and their impact on systems at all levels.

Generative AI has the potential for impact on all parts of educators' practice. Educators must be supported in this significant change in terms of time, professional learning, and to be partners in the creation of evidence to support their decision making.

#### Acknowledgement of contributions:

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QUT experts would be willing to engage further with the Committee to share their insights and help Members deepen their understanding of this critical and rapidly developing area.

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