Cooperative Research Australia

CRA's submission to the House Standing Committee on Employment, Education and Training's inquiry into the use of generative artificial intelligence in the Australian education system

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Cooperative Research Australia acknowledges the traditional custodians of the land on which we operate, the Ngunnawal people. We also acknowledge the traditional custodians of the various lands across Australia upon which our members operate.

We pay our respects to Elders past, present and emerging and celebrate the diversity of Aboriginal peoples and their ongoing cultures and connections to our lands and waters.

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Executive Summary

Cooperative Research Australia (CRA) welcomes the opportunity to provide a submission to the House Standing Committee on Employment, Education and Training's inquiry into the use of generative artificial intelligence in the Australian education system.

CRA is the voice of industry-research collaboration and advocates for the translation of research into commercial, economic, social, and environmental outcomes that benefit all Australians. Our members are the lynchpin in the Australian innovation system and are focused on creating new products, services, industries, and value in our economy. CRA represents Cooperative Research Centres (CRCs) and their spinoff/successor entities, CRC – Projects grant participants, 30 universities and research institutions, as well as other industry-research collaboration entities, associated businesses, alumni and professionals.

Our contribution focuses on the potential, risks and strategies to consider to strengthen the implementation of generative AI tools in the higher-education sector.

The highlights of CRA recommendations are:

- The strengths and benefits of AI to improve education outcomes include: personalised learning, enhanced critical thinking, accessibility and inclusivity, data-driven insights, streamlined administrative process and future ready skills.
- The future impacts of generative tools on Education can be turned into positives if we focus our efforts on continuous professional development, emphasising human value, clear policy guidelines and collaboration between different stakeholders.
- The implementation of AI tools encompasses risks and challenges which need to be carefully considered, in order to develop the right strategies to address them.
- We can draw on past/current experiences that represent a parallel to AI on Education. The experience of a virtual classroom rollout and the learnings from the Health sector on setting up the pathways for a successful implementation of AI tools, are cases that can serve as guidelines for best practice.
- A collaboration between educators, researchers, policymakers, and technology developers is needed to ensure that generative AI tools are developed based on evidence-based research and aligned with educational goals.

Cooperative Research Australia is committed to working collaboratively with the Australian Government in its efforts to preparing the way for the use of generative artificial intelligence in the Australian education system. We are committed to a prosperous and innovative future for all Australians, and -as such- we are open to facilitating a platform for further consultation and/or clarification on any of the recommendations.

A rapid survey conducted among education managers within our membership base revealed that many of them have limited exposure to generative AI tools, leaving them unsure of the full potential of these technologies.

At CRA, we recognize that providing accurate and comprehensive information about AI is crucial in enabling education managers to grasp, evaluate, and effectively implement generative AI tools to their advantage.

Through broader consultations, we gained insights into the practical applications of generative AI within the higher education sector. These insights were directly sourced from experts in the field, creating a synthesis of diverse perspectives.

Interestingly, while specialist academics have expertise in AI implementation, research institutions are slowly beginning to disseminate their expertise more widely across their organizations. As a result, many staff are awaiting guidance through policy or regulatory directives, before fully delving into its potential benefits.

For this reason, we recommend legislators addressing potential concerns and challenges and providing education institutions with clear guidelines and policy intentions, so that they can explore their options with more confidence. These may include ethical and privacy concerns, training and support, and long-term sustainability.

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.

The innovation ecosystem expertise on the strength and benefits of AI to improve education outcomes point to a range of possibilities including:

1. **Personalized Learning:** Generative AI tools can tailor educational content and experiences based on individual learning styles, preferences, and capabilities. This personalisation can lead to more effective and engaging learning experiences for students, as it addresses their specific needs.
2. **Enhanced Creativity and Critical Thinking:** Generative AI tools can stimulate creativity by providing students with new and unique challenges. These tools can encourage critical thinking and problem-solving skills as students interact with AI-generated scenarios and content.
3. **Accessibility and Inclusivity:** AI can help bridge the educational gap by providing accessible content to learners with disabilities or those in remote areas. Generative AI tools can adapt materials to different learning needs and ensure a more inclusive educational environment.
4. **Data-Driven Insights:** AI tools can analyse vast amounts of educational data to identify patterns and trends, providing educators with valuable insights into student progress and learning behaviours. This data-driven approach can inform targeted interventions and support personalised teaching strategies.

5. **Teacher Support and Professional Development:** AI can assist educators in managing administrative tasks, grading, and providing instant feedback to students. Additionally, AI can support teachers in their professional development by offering personalised learning opportunities and resources.
6. **Adaptability and Continuous Improvement:** Generative AI tools can adapt and evolve based on user interactions and feedback, continuously improving their effectiveness in supporting education outcomes.
7. **Streamlined Administrative Processes:** AI-powered tools can streamline administrative tasks, reducing the burden on educators and allowing them to focus more on teaching and student engagement.
8. **Future-Ready Skills:** Exposure to AI tools can help students develop the skills necessary for the digital age, preparing them for future careers in technology and data-driven fields.

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

In our consultations, we found a parallel between the time when the virtual classroom was first introduced and our current experience with AI. At that time, there were some concerns about job impacts, operations, skills, capability, capacity, etc.

Eventually, policy, practice (and patience) dissipated concerns and allowed for growth. If we were to analyse the first iteration of the virtual classroom and compare it to what it is now, the evolution would be clear. Now a days, staff have adapted to it, and it is difficult to imagine a higher education sector without it.

Using the virtual classroom as inspiration, we recommend that for the future impact of generative AI tools on teaching and assessment practices in education, upon the role of educators, and the education workforce, the following points should be considered:

- Professional development programs to equip educators with the necessary skills and knowledge to effectively integrate generative AI tools into their teaching practices. This includes an emphasis on ongoing training and support to keep educators updated with the latest advancements in AI.
- To future-proofing the education workforce, a focus is needed on initiatives related to reskilling and upskilling to prepare them for the changing landscape of education with the integration of AI technologies.
- Generative AI tools may augment and enhance the role of educators, rather than replace them. The unique abilities of human educators, such as emotional intelligence, empathy, and adaptability, are not easily replicated by AI.
- Generative AI tools have the potential to provide continuous assessment and timely feedback to both students and teachers. This can support formative assessment practices and enable educators to intervene when needed to address learning gaps.

- With the automation of administrative tasks, such as grading and lesson planning, can free up educators' time, allowing them to focus on building meaningful connections with students and designing innovative learning experiences.
- With the help of AI, the current frontier of education can be extended to reach wider audiences. This can help towards ensuring all students, regardless of their background or location, have equal access to quality education.
- A collaboration between educators, researchers, policymakers, and technology developers is needed to ensure that generative AI tools are developed based on evidence-based research and aligned with educational goals.
- Clear policy guidelines can provide the confidence needed to rollout AI in education, including but not limited to ethical frameworks, privacy and intellectual property regulation.

Risks and challenges presented by generative AI tools.

Risks and challenges	**Strategies to consider**
Ethical Guidelines and Standards: AI technologies can potentially be used in ways that compromise individual privacy, perpetuate biases, or lead to unethical outcomes. Lacking appropriate guidelines may result in unintended consequences, such as the misuse of AI-generated content or assessments.	Clear ethical guidelines and standards for the use of generative AI tools in education.
Transparency and Explainability: The lack of it may lead to a lack of trust and understanding among educators and students. If users cannot comprehend how AI-generated content is produced, they may be hesitant to adopt AI tools or question their reliability.	Promote AI models that are transparent and explainable, allowing educators and students to understand how AI-generated content or assessments are produced.
Bias Mitigation: Generative AI tools trained on biased data can perpetuate those biases in the content they generate, leading to unfair or discriminatory educational experiences. Addressing and mitigating bias is a crucial challenge in ensuring equitable access to quality education for all students.	Encourage methods to identify and mitigate biases in generative AI tools. Curate training data carefully, monitor for potential bias, and conduct regular AI system audits to ensure fairness.
Human Oversight: While AI can enhance educational experiences, excessive reliance on AI without human oversight poses a risk. Human educators play a critical role in reviewing and validating AI-generated content to ensure accuracy, appropriateness, and alignment with educational goals.	Ensure educators review and validate AI-generated content to maintain appropriateness and accuracy.
Responsible Data Use: The risk of irresponsible data use arises when AI tools collect and process student data without adequate safeguards. Mismanagement of data can lead to privacy breaches, misuse of information, or unauthorized access, compromising	Promote responsible data collection, storage, and use in AI implementations. Ensure data is used only for educational purposes and is adequately

the trust between educational institutions and stakeholders.	protected from unauthorized access.
Security and Privacy Measures: The integration of AI in education requires robust security measures to protect AI models and educational data from cyber threats. Failing to implement proper security protocols can lead to data breaches, compromising student privacy and the integrity of the education system.	Extend the cyber security national strategy to protect AI models and educational data from cyber threats and potential misuse. Implement privacy-preserving techniques to safeguard individual student data.
Academic Integrity Policies: With the introduction of AI in education, the risk of academic misconduct may evolve, including AI-generated content used for plagiarism or cheating. Establishing academic integrity policies to address these new challenges is essential to maintain the credibility and trustworthiness of educational institutions.	Promote collaboration or forums of educational institutions to develop and enforce academic integrity policies that address potential misuse of AI tools, including plagiarism detection and cheating prevention.
Rigorous Research Validation: The lack of rigorous validation of AI tools for education can lead to the adoption of ineffective or unreliable tools. Proper research and validation are essential to understand the impact of AI on learning outcomes and ensure that educators make informed decisions about integrating AI in classrooms.	Encourage rigorous validation of AI tools for educational purposes. Promote peer-reviewed and transparently published studies to ensure effectiveness and reliability.
Education and Awareness: Educators, students, and stakeholders need to be aware of the opportunities and challenges posed by generative AI tools in education. Lack of education and awareness can hinder the responsible and effective integration of AI in classrooms	Develop ongoing education and awareness programs about the opportunities and challenges of using generative AI tools for educators, students, and stakeholders. Promote discussions on ethical considerations and responsible AI use.
Collaboration and Multidisciplinary Approaches: Addressing the complex challenges of AI in education requires a collaborative effort from experts in education, AI development, ethics, and policy. A lack of collaboration can result in fragmented approaches and limited perspectives on ethical and practical considerations.	Enable collaboration between experts in education, AI development, ethics, and policy to collectively address the complex challenges posed by generative AI in education.

Ensuring Equitable access to AI Benefits for Students and Families from Disadvantaged Backgrounds

Going back to the example of the virtual classroom, a few aspects to consider are:

1. **Digital Infrastructure and Access:** Invest in improving digital infrastructure and internet connectivity in disadvantaged communities, including rural and remote

areas. Ensure that schools and educational institutions in these areas have access to reliable internet and necessary technology to use AI tools effectively.

2. **Affordable Technology:** Research providers to procure or support negotiations with technology companies to provide low-cost or subsidized devices for disadvantaged students and families.
3. **Community Engagement:** Engage with local communities and families to raise awareness about the benefits of AI in education and address any concerns or misconceptions they may have.
4. **Training and Support:** Provide comprehensive training and support for educators, parents, and students on how to use AI tools effectively. Ensure that educators are equipped with the necessary skills to integrate AI into their teaching practices and that parents understand how AI can support their child's learning.
5. **Research and Evaluation:** Invest in research and evaluation of AI implementations in disadvantaged communities to understand their effectiveness and identify areas for improvement. This data-driven approach will help optimize AI use for these cohorts.
6. **Policy Strategy:** Prioritise policies that grant equitable access to AI technologies and educational resources for disadvantaged communities.
7. **AI for Personalized Learning:** Promote the use of AI-driven personalized learning platforms that adapt to each student's needs and learning pace. These platforms can help address individual learning gaps and cater to diverse learning styles.

International and domestic practices and policies for the use of generative AI tools in education applicable to the Australian education sector.

Experts in the field within our cohort have suggested international examples that Australia could be looking into such as the US, Canada, Singapore and Israel. Features that these countries have in common is that they have placed AI on a central pedestal, that there is a significant thinking about it and that it is matched with increasing investment to stay ahead of the game.

Australia can draw on the spaces where it has led implementation. Australia has significant implementation of AI tools in the health sector. We have experts in the field, users, policy advocates, ethical frameworks, etc through organisations such as the Digital Health Cooperative Research Centre. We believe that we should consider our advantage and learn from that experience so we can be at the forefront of another sector, such as education.

In combination with research on other AI models internationally, by promoting inter-sectorial collaboration, Australia can position itself as the spearhead of AI implementation in education.

Further recommendations to manage the risks, seize the opportunities, and guide the potential development of generative AI tools.

We have covered a few recommendations based on our consultations to understand our current state, what are the concerns and what are the missed opportunities for the education sector.

Cooperative Research Australia is also making a submission for the Department of Industry Science and Resources on supporting responsible AI. We encourage to read our submission in conjunction with this response for a more comprehensive view on the potential development of generative AI tools. We will attach it as a separate document.