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

Inquiry into the use of Generative Artificial Intelligence in the Australian Education System

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Date 13 July 2023

Dear Committee,

We welcome the opportunity to contribute to this important inquiry into the use of generative AI in the Australian education system. We are a team of academics from RMIT University. Our aim in this submission is to contribute our experience using generative AI in research and education. We outline RMIT generative AI initiatives — such as short courses and internal workshops — and how we are navigating the inevitable but welcome disruption of AI throughout the education system.

We are deeply involved in the scholarly practice of research and education through the RMIT Blockchain Innovation Hub, the RMIT The Business School Vietnam and RMIT Digital 3. Our

research examines frontier technologies — notably blockchains and AI — from the perspective of economics, law, finance and taxation. We have collectively spent decades studying, using and building the technologies and business models of the digital economy. The breadth of our research informs our views on how generative AI may change the nature of education.

Our education initiatives translate these research insights to students. We have produced tens of courses and degrees on the frontiers of the digital economy, including undergraduate, postgraduate and short courses on topics including blockchains and AI. For instance, we have recently released short courses including *Generative AI: Implications and Opportunities for Business* and *Doing Business in Web3*. As we will describe below, we have also launched internal workshops on generative AI and its use for RMIT staff and industry partners.

The public narrative surrounding generative AI typically emphasises potential harms. There have been many calls for regulatory and policy responses to address real and perceived issues from deepfakes through to job losses. This cautious approach to a new disruptive general purpose technology is common and it is unsurprising. Indeed, the perception of the early stages of many disruptive technologies emphasise tangible harms rather than the potential enormous, but ambiguous (initially), benefits that come alongside innovation. While the adoption and diffusion of generative AI will be disruptive, in the famous words of economist Joseph Schumpeter, it will be a process of creative destruction and rebirth that ultimately generates greater prosperity.

Generative AI will bring significant benefits to the Australian education system. It will raise the productivity of workers, create more robust research, and provide for more bespoke learning opportunities for students. Many benefits will be further realised through combination with other frontier technologies, such as data analytics and new decentralised credentialing infrastructure.

This inquiry is about the uses of generative AI in the Australian education system — those uses must be *discovered*. We simply don't yet know how generative AI will be used in a sustainable and value-generating way. The viability of various uses, including their costs, will emerge through a

process of experimental trial and error. This process is fundamentally entrepreneurial — we are discovering valuable uses under uncertainty. There is no other way but to experiment.

Thinking about the future uses and impact of general purpose technologies such as generative AI is hard. And so while our submission is optimistic about the opportunity of generative AI, our approach is to provide practical insights into how we are using and embracing this technology in our scholarly practice. We also discuss how we are thinking about the use of generative AI in research and education. Some of these thoughts may turn out to be wrong. That is the nature of innovation. Nevertheless, our views are informed by decades of combined experience in the education system, and a deep understanding of the economic effect of new technologies on organisations and institutions.

There are two parts to our submission. In the first part we ask how generative AI can be used in the research process. In the second part we examine how generative AI can be used in the education process. The common thread is a belief that this technology will speed up the transition to a more digitally-enabled and dynamic education system. This submission only outlines some of our experiences. **We would welcome the opportunity to address the committee on the themes or specifics of our submission.**

USE IN RESEARCH (WRITING TOOL, ANALYTIC TOOL, MENTOR)

It is incumbent on Australia's research community to experiment with the use of generative AI in their work. We outline three potential applications of generative AI in research:[1]

- **As a writing tool** to develop more robust research. As a writing tool, generative AI helps to generate new and adjacent ideas, refine arguments, and overcome writers' block — all of which have the potential to improve both productivity and quality.

[1] This section draws partly on Berg, C. (2023). The case for generative AI in scholarly practice. Available at SSRN 4407587.

- **As an analytic tool** alongside other scholarly methods. Generative AI models are increasingly being used as a new analytical method, from revealing patterns in case studies to acting as an experimental participant.
- **As a mentor** to guide researchers through complex ideas and methods, and to provide feedback. Generative AI models can not only help researchers navigate new areas, but provide bespoke tutorial content (a kind of education) and imitate a peer review process from multiple perspectives.

Writing with Generative AI

As a writing tool, generative AI will help researchers produce more robust and clear research.

A common misconception is to assume that the role of the researcher in this process is passive. People often imagine that a researcher briefly prompts the model and the output is some long-form highly-polished and relevant text. The reality of using generative AI in the research writing process differs significantly from this perception. Even with well-crafted prompts, high-quality and sufficiently deep and long text outputs that would feed directly into academic writing are rare.

Our experience is that the highest-value integration of generative AI into the academic writing process is far more active, iterative, and collaborative. The process is better described as a process of co-production between researcher and the model. This approach could also be described as Socratic, with the researcher undertaking lengthy dialogue and conversation with the model. Our experiences mirror this, having spent hours discussing complex topics with generative AI models, before closing the model and beginning to write.

In this way, it is also a misconception that using generative AI in the writing process always involves the direct copying and pasting of outputs. By contrast, often the model is useful as a tool to provide new perspectives, refine ideas, critique and explore alternative viewpoints. They can help overcome “writer's block”, rather than becoming the writer. The relationship between the researcher and the model involves using the researcher’s expertise to strategically guide the prompts and outputs.

That strategic expert insight is necessary to generate both valuable and interesting findings — knowing what questions to ask and how to ask them remains a human skill. Importantly, experience and expertise are necessary to make judgements over the validity and value of generative AI models and their output.

The role of generative AI in the academic writing process differs across disciplines and methodological approaches. Its applicability is of course constrained by the inputs into the model, and will be more effective at applying and understanding more widely applied methodological approaches and ideas. Our experience has been that these tools are useful to stimulate new and adjacent ideas when writing complex conceptual and theoretical topics.

Here we have largely described the value of generative AI to help researchers to refine, expand or contract their arguments. Each of these examples of integrating generative AI in the writing process maintain an important and critical role for researcher expertise in generating novel results. Below we describe how generative AI can be used not just for conceptual or theoretical refinement, but as an analytical tool.

Generative AI as an analytical tool

As an analytical tool, generative AI adds to more familiar methods in a scholarly toolkit. The models can be used as part of a methodology for a board range of uses including generating synthetic data, classifying the language of a large dataset (e.g. the sentiment of social media posts), identifying unexpected patterns in case studies (e.g. through applying a theoretical framework to scattered empirical data), and creating new personas of subjects in an experiment (rather than the time-consuming and costly process of human subjects). Interestingly, many of these applications provide significant opportunities over other methods that might require costly and lengthy approaches (including ethics approval). These examples are additions to the existing suite of tools that academics use in understanding the world. They also require researcher expertise in creating valuable outputs including an understanding of how and why different methods are applied in different contexts.

Take the examples of using generative AI in economic experiments and market surveys. Current methodologies for conducting market surveys and economic experiments often suffer from issues such as bias, limited scalability, inefficiency, and the inability to test the clarity of instructions before implementation. Generative AI enables scalable and efficient analysis of vast datasets, providing a potentially more objective interpretation than humans. This efficiency, coupled with its constant availability, allows for accelerated and cost-effective data collection and analysis.

Furthermore, the simulation capabilities of generative AI provide a way to model complex economic systems, offering valuable insights into diverse economic decisions or policies. The ability of AI to personalise surveys and adapt experiments based on individual responses enhances the accuracy and robustness of the data. Notably, the comprehension skills of LLMs can be leveraged to evaluate the clarity and validity of survey and experiment instructions before implementation, reducing potential misinterpretations and ensuring the experiment's smooth execution.

It is important to acknowledge that the use of AI in experiments and surveys also raises significant challenges and concerns regarding data privacy, consent, and the potential misuse of AI. By deepening their understanding of AI systems and the training data used, researchers can anticipate these potential challenges and employ proactive strategies to conduct AI experiments that are not only more effective, but also ethically sound. The extent to which these new methods will be accepted by the scholarly profession will emerge over time (such as through the peer review process), just as we experienced with previous technological advances (e.g. search, computational software).

Using generative AI as a research mentor

As a mentor, generative AI models can guide researchers throughout the research process. Research often involves grappling with complex tasks or methods that are necessary to produce valuable outputs, but outside of our training or skill set. Due to the nature of the peer review process, we must also contend with how different perspectives or disciplines might react to research outputs. Generative AI models can act as a mentor in these circumstances.

For instance, generative AI can help us to navigate complex new topics, such as branches of mathematics, theoretical concepts or new coding languages. Importantly, these models can guide us through new topics not in a general sense, but tailored to the local conditions and specific problems that we face. We are no longer limited to grasping entire new general fields, but we can mobilise the knowledge contained within an LLM to specifically tailor and personally guide us through a problem. This suggests significant productivity improvements in academic research, and suggests a lowering of the cost of cross-disciplinary research.

Generative AI models also help researchers make their research more robust. They provide quick, low-cost critique, assessment and review of research. We have found generative AI particularly useful when prompted to provide peer reviews and critiques from particular perspectives, enabling us to refine our research outputs outside of the often-lengthy and laborious peer review process. As researchers we value rapid and personalised feedback on our work in order to improve it. So too will be the case in education.

USE IN EDUCATION

The use of generative AI in education will be disruptive but will open up significant opportunities for both educators and learners. For educators, generative AI is an important productivity tool that can enable lower-cost and more bespoke offerings. We can educate better, and on more complex topics. For learners, generative AI will fundamentally reshape their education opportunities, not least because generative AI will fundamentally reshape the economy.

The first and most obvious use is integrating generative AI into the classroom. It's first important to examine why this matters. Authentic learning and assessment, to provide employment-ready graduates, means students must learn how to use generative AI in practice. That means using generative AI in the classroom. There are many ways this can be done, such as using or requiring use in assessments. Educators must adopt a perspective that generative AI will be diffused throughout the economy, so it is also incumbent on them to use the technology with students.

There will, inevitably, be tensions in bringing generative AI into the classroom. Use of the technology will pinpoint attention on precisely what learning outcomes are being taught and assessed, and whether they are as important in the new generative-AI-powered digital economy we're moving into. The new skills that students require (e.g. prompt engineering, editing model outputs, fact checking), for the *new jobs* that we might not have conceived of yet, will also raise many hard questions around evolving norms (e.g. authorship, plagiarism). These tensions will need to be resolved, and new norms will emerge. One effective way to do this is through further experiments, and educational institutions (including universities) offer ideal settings for this.

At a more practical level, generative AI will also improve educator productivity, including:

- Designing bespoke case studies.
- Creating assessment tasks.
- Generating rubrics.
- Giving detailed feedback to students.

Ultimately these tools will lower the cost of traditional activities in educating, and present opportunities to change its shape towards more value-adding and potentially satisfying work for educators. This is good for educators and for students. For educators, it enables them to delve deeper into more value-added roles focused on authentic engagement and the assurance of learning. It is particularly good for learners who are disadvantaged and lack access to education support, such as tutoring.

At a deeper level we anticipate the nature of education to fundamentally shift. Some of us have previously written about the suite of new technologies (including blockchains) that will shape the organisation of the university sector.[2] Generative AI will contribute to this deep disruption in our education system.

[2] https://soyourunauniversity.substack.com/

Universities will shift not just because the dynamics between the educator and the learner have changed (e.g. a massive lowering of the cost of producing traditionally written content), but because the skills that are valued in an economy will also shift. Much of this will involve students moving *up* a level of abstraction in their learning, and a further move towards applying first-principles learning to novel scenarios. Education will shift from written assessments to oral examinations, interpersonal skills, pitch decks, and so on, much more aligned with the work tasks knowledge workers and professionals will be expected to be doing. The boundaries between work in the economy and education will become blurrier, and so too will the boundaries between disciplines and methods.

Educators will need to evolve with these dynamics. They will develop sound practices that are informed by understanding the benefits and challenges generative AI presents, and they will need to evolve *at pace*. For students to be digitally ready, they will need to have experienced the tensions and understand ethical use and conduct to develop the necessary skills and understandings to be work ready. Institutions will need to be mindful of policies and procedures implemented that facilitate appropriate protections (such as data privacy), whilst enabling critical, value adding opportunities.

In this submission we have provided some broad insights into the impact of generative AI models on both research and education. Our insights are based on our experiences in the higher education system. At RMIT we are also undertaking significant activities to facilitate the adoption and diffusion of generative AI:

- Launched a global 4-week short course on Generative AI: Implications and Opportunities for Business.[3] The course is hosted on Future Learn and examines how AI can disrupt business.
- Hosted a workshop as a joint initiative between the RMIT Blockchain Innovation Hub, RMIT Digital 3 and the The Business School RMIT Vietnam, to explore and encourage the use of

[3] https://www.futurelearn.com/courses/generative-ai-implications-and-opportunities-for-business

generative AI in research.[4] That workshop covered applications including as a writing tool, literature review, data analyst and experimental subject.

We would be pleased to provide any further information to the committee regarding our submission.

Regards,

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[4] https://www.youtube.com/watch?v=Awsw3oN03oo