

AI in tertiary education: progress on research and practice

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Generative artificial intelligence (AI) has had a significant impact in tertiary education for practitioners and researchers during 2023. We review the way in which academics have made sense of generative AI, revisit our proposed research agenda and reflect on our changing roles as academics in relation to learning, teaching, design and policy.

Keywords: generative AI, educational technology, educational research

Introduction

In our recent editorial mapping a research agenda for generative artificial intelligence (AI) in tertiary education (Lodge et al., 2023), we argued that tertiary education has a significant role to play in preparing students for a world in which generative AI is used in all aspects of their lives and that we will be best placed to do this if we are collecting evidence to inform decision-making. During 2023, there were rapid changes to the reactions to, and discussions about, generative AI in relation to educational technology (EdTech) in tertiary education. In this editorial, we review the opportunities that our community had to learn about and with generative AI, revisit our proposed research agenda for generative AI (Lodge et al., 2023) and reflect on our roles as academics in relation to the papers in this issue. We argue that as EdTech researchers (Goodyear, 2023) we have a professional obligation to build our capacity in order to meaningfully engage with generative AI in the context of our practice. If we do not, then there is a significant risk that others, with commercial interests, will control the agenda and the way in which decisions are made about generative AI in tertiary education.

Opportunities for learning about and with generative AI

An early version of ChatGPT was released by OpenAI on 30 November 2022 (Marr, 2023). Our colleagues were testing it out, only a couple of days later, at the ASCILITE conference in Sydney, entertained by the novelty yet able to easily demonstrate the problematic underlying algorithms. In the 12 months since, there has been a rapid engagement with the topic as it has impacted our practice in relation to learning and teaching, research, as well as administration and general interactions in our work lives. Generative AI has been positioned as a “game changer” for higher education (e.g., Green, 2023). Internationally, universities were positioned as key stakeholders with responsibility both for academic integrity as well as to prepare citizens and in particular the future workforce with appropriate skills to productively use generative AI in their work (e.g., Laverdiere et al., 2023). Responses to the accessibility of generative AI also included advice about how it could be used to implement personalised or adaptive learning (Laverdiere et al., 2023). Only earlier in the year, automated approaches such as these were being discussed in mostly conceptual ways (e.g., Thompson et al., 2023). In Australia, many universities released policies in time for units run in first semester. The primary focus of the conversation and policy implementation has been assessment and academic integrity.

Building teaching staff capability around the pedagogical opportunities and challenges of generative AI has been a key area of focus within this context of evolving tools and changing perspectives. FutureLearn (2023) offers a unit in generative AI in higher education, led by academics from King’s College London, although they are not researchers in this field. A strong emphasis of the professional development offered

by learning and teaching units has been to inform assessment design to mitigate academic integrity issues. There were also opportunities for informal learning by attendance at panel presentations, for example, “Who does the Thinking? The Role of Generative AI in Higher Education”, hosted by the United Nations Educational, Scientific and Cultural Organisation (UNESCO)’s International Association of Universities (2023). The proliferation of these panel presentations and the number of people attending can be interpreted as the need we, as practitioners and researchers, had to talk about this changing space. There were also a number of opinion pieces and editorials written in an attempt to unpack the hype (e.g., Hodges & Ocak, 2023). Many universities provided practical advice for staff that is open to interested people beyond their own university (e.g., the University of Sydney (2023) has provided a series of insightful and open blog posts on AI in teaching and assessment).

During 2023, international and national policy positions were released by organisations including UNESCO (Miao & Holmes, 2023), the U.S. Department of Education (Cardona et al., 2023) and the Russell Group (2023) in the United Kingdom. These policies mainly focus on K-12 education, with less discussion about the higher education context and even less on vocational and corporate or workplace training. The UNESCO guidance is thorough and includes recommendations for a policy framework for the use of generative AI for education and research (Miao & Holmes, 2023). As well as promoting inclusion, equity, interdisciplinary approaches and a plurality of opinions and expressions of ideas, several of their measures relate to the creation of an evidence base for decision-making and capacity building of students as well as academics in the use of generative AI for research and education. The Russell Group (2023, p. 1) released five principles that “universities will support students and staff to become AI-literate; staff should be equipped to support students to use generative AI tools effectively and appropriately in their learning experience; universities will adapt teaching and assessment to incorporate the ethical use of generative AI and support equal access; universities will ensure academic rigour and integrity is upheld; and universities will work collaboratively to share best practice as the technology and its application in education evolves”.

In Australia, there were several significant national responses to generative AI during 2023. The Tertiary Education Quality and Standards Agency (TEQSA, 2023) has provided a range of resources including slides that contain a regulatory perspective, advice for students and tips for using generative AI in research. The advice about assessment reform commissioned by TEQSA (Lodge et al., 2023) provided support materials for learning and teaching decision-makers within institutions and was a unique opportunity for almost 20 academics to collaborate on thinking through the impact of generative AI on assessment practice in universities. This group included academics from 12 universities with a range of expertise in learning, technology and assessment in higher education who spent time framing the discussion paper. This was then sent to academics from another 21 higher education institutions to provide feedback on the paper before it was released for further feedback from the community. TEQSA’s response to generative AI also included other examples of collaboration with higher education providers. In partnership with Deakin University, a series of webinars was provided, which contained links to individual universities’ advice for academics about the use of generative AI. These include advice about designing assessment for artificial intelligence and integrity (Flinders University, 2023), a research integrity resource sheets in relation to artificial intelligence and research outputs (Griffith University, 2023) and specific advice about the use of ChatGPT in teaching from the Australian National University (Swift, 2023).

Another significant national response in Australia came from the House Standing Committee on Employment, Education and Training’s inquiry into the use of generative artificial intelligence in the Australian education system, following a referral from the Minister for Education (Parliament of Australia, 2023). Submissions were invited to address any of six key topics related to generative AI tools for teaching and learning in early childhood education, schools and higher education sectors. Almost 100 submissions were accepted, and the committee is currently calling on people involved in these submissions to give evidence at public hearings. When these are complete, the government will publish a response. The submissions are public documents from stakeholders including individuals, universities, networks of universities, government departments and other advocacy organisations.

Also in the Australian research context, the Australian Research Council Discovery Grant scheme funded 421 projects in total, and four were in relation to generative AI and education. This research included two projects focused on supporting school teachers, one focused on assessments for writing, and the final about democratising policy (Australian Research Council, 2023). This amounted to almost \$2 million invested in research related to generative AI in education (Australian Research Council, 2023), although none of it specifically focused on the higher education sector. At the ASCILITE conference this year, 14 of the 142 presentations included generative AI in the title, although the topic was raised in many more presentations and workshop discussions across the event.

Despite all these developments in Australia and globally, much of the agenda is still being driven by the technology and technology advocates.

Revisiting a research agenda for generative AI in higher education

Given the significant advances since our editorial earlier this year, it is timely to revisit our research agenda for generative AI in higher education and reflect on what has happened in this space. We outlined five critical research areas in which evidence was needed to inform decision-making in relation to generative AI in tertiary education. These included sensemaking, assessment integrity, assessment redesign, learning and teaching with generative AI and ethics and AI. Although there has been initial work done in all these areas, as expected, the way in which evidence and research are needed has become more nuanced as we have more experience of the impact of generative AI on learning and teaching.

There is still sensemaking work to be done, as misconceptions about what generative AI is and how it works remain common. However there is also more work needed on understanding the skills needed to engage with generative AI, for teaching and learning but also in professional situations. There is an obligation for those in tertiary institutions to continually update their knowledge and skills in relation to generative AI, not only to support their own practice but also to critique, adapt and expand their knowledge as new platforms become available.

Academic integrity, in particular cheating on assessment tasks, remains an acute problem. But more chronic issues about what tertiary education should and could be like in the age of AI are emerging, bringing with them some uncomfortable realities. For instance, if work in some professions is going to be largely done with or by generative AI (think architecture, for example), will there be an ongoing need to do entire degrees devoted to these professions?

Assessment redesign continues to be a key consideration and focus of institutional responses. Despite what generative AI can do, it is apparent that a level of foundational knowledge is necessary for those who want to drive generative AI (Bozkurt & Sharma, 2023). Generative AI can often do the busy work and produce results beyond the capability of humans lacking certain skills (e.g., MidJourney can be used to create an image by someone with limited artistic ability). However, while they may not be able to draw, knowledge of what styles and parameters to set for the design of the image (e.g., a photo, drawing, in the style of ...) is necessary. It is increasingly becoming apparent that the level of knowledge students will need to move beyond the “acceptable” to get “good” or “excellent” responses from generative AI is higher than some educators and administrators may think. Despite this, there is still the possibility that students will use generative AI strategically to get responses that are “just enough” to pass.

In order to inform our approaches to learning and teaching with generative AI, including decisions about using or avoiding these tools, we need a better understanding of what generative AI use looks like in the professions. What skills do students need to harness the power of generative AI and how do we frame this within an ethical approach to maintain the “professional” conduct of industry employees? The focus of research to come will need to shift to figuring out what learning and curriculum should look like now that the AI genie is out of the bottle. The problem we face goes well beyond assessment; we need a balanced view of the threats of generative AI alongside the possibilities to support the learning process (e.g., using generative AI as a personal tutor or to provide feedback). The role of the educator remains

very important as a mediator to help students discern when the generative AI provides information that might be questionable or simply incorrect.

Ethics and generative AI continue to be a focus for discussion amongst researchers and practitioners. There are concerns regarding the transparency of the data (and the sources of the data) on which large language models are based, with implications for whether diversity of cultures and language is accounted for. In the Australian context, students as well as academics need to consider whether their use of generative AI is in line with copyright laws and ethical guidelines, which differ depending on the context in which the tools are used. As there are new developments in user interaction design and functionality in existing and new tools, policies and procedures will need to be reconsidered.

We did not directly address policy in our agenda earlier this year, although it has been a significant driver in research directions and in situating generative AI conversation in Australia primarily through TEQSA initiatives. There are still many questions about how AI can be effectively implemented in tertiary education institutions at scale. Also a challenge is how to communicate these policies to educators on the front line of learning and teaching – especially where some uncertainty remains (as institutions wait to see how fast generative AI will develop). Policies are likely to change and will have to adapt as the technology evolves.

Our roles in EdTech research with generative AI

AJET welcomes good quality work in this area for publication to contribute to the wider conversation and help the tertiary education community respond to, challenge and evolve along with the technology. In this themed issue, the articles cover the use of generative AI for learning in a global context through an engineering course in South-east Asia (Pham et al., 2023), students' experiences with ChatGPT in online courses in Turkey (Kayali et al., 2023) and its use in teaching in universities in China and Vietnam (Li, 2023; Thanh et al., 2023). These studies show that generative AI can be used in productive ways in higher education settings but all raise the importance of instructors being informed participants in its use. The paper by Matthews and Volpe (2023) presents research that is related to whether instructors in an Australian university can identify texts written by generative AI. A key aspect of these findings is a better understanding of academics' decision making processes in relation to the detection of a human voice in the text (Matthews & Volpe, 2023). Knight et al.'s (2023) article concludes this themed issue by presenting interesting insights into the commonalities and tensions in response to the use of generative AI in education in Australia and raises the issue of whether the processes of policy creation currently provide opportunities for more diverse views and concerns.

Goodyear (2023) identified a number of meanings of EdTech that included those who are “developing, testing and promoting new technology-based tools and services” (p. 2) as well as “people whose job involves supporting other people's use of technology in education” (p. 2). As EdTech researchers with generative AI we have also become public intellectuals (Giroux, 2016), with more opportunities than ever before to speak in public forums and influence national and international policy and recommendations related to the messy intersection of technology, learning, teaching and design. We have had an opportunity to explain our craft, and in doing so, we need to be able to advocate for research and evidence. To a certain extent, this has been successful in the Australian context, if we take the collaborative nature of the TEQSA recommendations and the success of national research funding as measures. As this research is carried out and the recommendations are implemented, sharing experience and observations as well as reporting on progress and the need to be agile and adapt as the technology shifts will be key.

Conclusion

AI in education has been a topic that has been discussed and researched for a long time, without much progress in terms of widespread implementation or uptake until the last year or so. In order to be the leaders in this field, we must be prepared to meaningfully engage – as learners, designers, teachers and

public academics, and in doing so, address our own misconceptions and reluctance to change practice. If we do not, we risk becoming the barriers to sharing of the vital evidence needed to contribute to decision-making by institutions, colleagues and learners. We need to help connect the technology (generative AI) with the pedagogical concepts and the learning designs that will enable educators to use generative AI effectively.

What has been nice to do for this editorial is to shift from the opinions and sensemaking that comprised most of the commentary during this year, to being able to provide some of the initial evidence about a range of practices within academia. We see this as only the first of many opportunities to ensure that our community has access to the highest quality research to inform our different roles. In turn, it is the responsibility of all of us to continue to be curious, engage with new developments and consider the impact on all aspects of our practice so we can ensure that we are the ones leading the conversation of how generative AI is incorporated within our policies and practice.

Author contributions

Kate Thompson: Conceptualisation, Writing – original draft; Writing – review and editing; **Jason Lodge:** Writing – review and editing; **Linda Corrin:** Writing – original draft; Writing – review and editing.

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