

**TENSIONS BETWEEN GENERATIVE AI PRINCIPLES AND PRACTICE IN
EQUITY EDUCATION¹**

TENSÕES ENTRE OS PRINCÍPIOS DA IA GENERATIVA E A PRÁTICA NA
EDUCAÇÃO PARA EQUIDADE

TENSIONES ENTRE LOS PRINCIPIOS DE LA IA GENERATIVA Y LA PRÁCTICA EN
LA EDUCACIÓN PARA LA EQUIDAD

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ABSTRACT:

Many strategies have been proposed for responding to generative AI (genAI) in higher education since the public launch of ChatGPT, but many challenges remain for teaching, learning, and assessment. This conceptual essay explores tensions arising from the introduction of genAI into higher education, focusing on implications for equity outcomes. These tensions include the need to teach foundational academic skills concurrently with critical AI literacy, assessment redesign challenges, and genAI's impact on knowledge production. In this articulation of tensions, genAI is conceptualised as an “assemblage” of technologies, sociopolitical and pedagogical contexts, epistemological foundations, and so on. By understanding genAI in this way, this essay argues that there are fundamental aspects to how genAI functions as a technology, along with the particularities of the contexts into which it is introduced, that make it a potential threat to equity outcomes. Countering this potential threat must not be left up to individual educators but will require institutional and sector-wide leadership.

Keywords: generative artificial intelligence; equity; assemblage; assessment; higher education

RESUMO:

Muitas estratégias foram propostas para responder à inteligência artificial generativa (genAI) no ensino superior desde o lançamento público do ChatGPT, mas muitos desafios permanecem para o ensino, a aprendizagem e a avaliação. Este ensaio conceitual explora as tensões que surgem com a introdução da genAI no ensino superior, com foco nas implicações para os resultados de equidade. Essas tensões incluem a necessidade de ensinar habilidades acadêmicas fundamentais juntamente com a literacia crítica em IA, os desafios de reformulação da

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avaliação e o impacto da genAI na produção do conhecimento. Ao conceber a genAI como um "assemblage" de tecnologias, contextos sociopolíticos e pedagógicos, fundamentos epistemológicos, entre outros, este ensaio argumenta que existem aspectos fundamentais de como a genAI funciona como tecnologia, juntamente com as particularidades dos contextos nos quais é introduzida, que a tornam uma ameaça potencial aos resultados de equidade. Combater essa ameaça potencial não deve ser deixado a educadores individuais, mas requer liderança institucional e setorial.

Palavras-chave: inteligência artificial generativa; equidade; assemblagem; avaliação; ensino superior.

RESUMEN:

Se han propuesto muchas estrategias para responder a la inteligencia artificial generativa (genAI) en la educación superior desde el lanzamiento público de ChatGPT, pero persisten muchos desafíos para la enseñanza, el aprendizaje y la evaluación. Este ensayo conceptual explora las tensiones que surgen con la introducción de la genAI en la educación superior, centrándose en las implicaciones para los resultados de equidad. Estas tensiones incluyen la necesidad de enseñar habilidades académicas fundamentales junto con la alfabetización crítica en IA, los desafíos en el rediseño de la evaluación y el impacto de la genAI en la producción de conocimiento. Al conceptualizar la genAI como un "ensamblaje" de tecnologías, contextos sociopolíticos y pedagógicos, fundamentos epistemológicos, entre otros, este ensayo argumenta que existen aspectos fundamentales de cómo la genAI funciona como tecnología, junto con las particularidades de los contextos en los que se introduce, que la convierten en una amenaza potencial para los resultados de equidad. Contrarrestar esta amenaza potencial no debe dejarse en manos de educadores individuales, sino que requiere liderazgo institucional y sectorial.

Palabras clave: inteligencia artificial generativa; equidad; ensamblaje; evaluación; educación superior

Introduction

Since the public emergence of generative AI (genAI) tools such as ChatGPT in late 2022, educators have scrambled to find ways to take advantage of the opportunities presented by genAI while navigating its many challenges. This sharing of ideas and practice is highly valuable and has led to guidelines and principles that help integrate genAI into university curricula (e.g. Commonwealth of Australia, 2023; Lodge *et al.*, 2023; Lodge, 2024; UNESCO, 2023). Studies of educators' perspectives have generally found that while educators feel that genAI should be integrated into curricula, there are various challenges and concerns about doing so (e.g. Barrett and Pack, 2023; Fuller and Barnes, 2024; Kasneci *et al.*, 2023; Kutty *et al.*, 2024). Anecdotal conversations also suggest that even educators with a strong knowledge of genAI struggle to manage its impact. Despite the numerous guidelines and sharing of advice, it appears there is no ideal approach to integrating genAI into educational contexts, and the challenges can at times seem overwhelming.

One of the persistent challenges with managing genAI's impact is how educators can ensure equitable outcomes for students. The first measure proposed by the UNESCO (2023) in

its policy guidance for genAI in education and research is to “promote inclusion, equity, and linguistic and cultural diversity”. It is this issue of genAI’s implications for equity that we explore in this conceptual essay, drawing on our experiences as educators in enabling/pathway programs in an Australian university with a focus on equity outcomes. While genAI presents many challenges for educators today, we focus here on three main sources of tensions: the concurrent need to help students learn foundational academic skills and critical AI literacies; strategies to redesign assessments in response to genAI and the consequences for equity outcomes; and the impact of genAI’s machinic operations on knowledge production and the pursuit of equity.

This essay aims to deepen the discussion of these challenges by arguing that many of the tensions educators are now experiencing are caused by the introduction of genAI into specific socio-material contexts. Rather than treating genAI simply as a bundle of technological features, this essay understands genAI as an “assemblage” (Lindgren, 2023) of technologies, sociopolitical and pedagogical contexts, epistemological foundations, and so on. Understanding genAI this way allows for a deeper understanding of the tensions and challenges currently being experienced in teaching and learning practices.

Because the tensions experienced by educators emerge from the collision of the technology with specific contexts, we argue that we must attend to the particularities of these contexts to effectively manage genAI’s impact. An important implication stemming from this point is that these tensions cannot be resolved solely through the actions of individual educators, such as tweaks to curriculum content and assessments. The significance and complexities of these various contextual factors means that comprehensive strategies and leadership need to come from universities and higher education sectors to ensure genAI’s impact on education is effectively managed and equity outcomes are safeguarded.

Enabling education and equity

To provide context for the following essay and explain our roles and perspectives as educators, this section outlines the “enabling education” programs in which we work. Students from marginalized contexts have historically faced challenges in their access to higher education. Consequently, enabling education programs are an enactment of Australia’s move to widen participation for groups of students who are under-represented in higher education. The programs play an important role in opening access to tertiary education and achieving greater social inclusion for students who would not typically enter university via the “traditional” school-university pathway. Internationally, there are similar models and initiatives

such as academic development programs in South Africa, access courses in Britain, developmental education in the United States and foundation and/or bridging programs in New Zealand.

The enabling education student cohort includes a significant representation of individuals from low socio-economic backgrounds, Indigenous communities, culturally and linguistically diverse groups, as well as those from regional and remote areas. The programs, alternatively known as pathways, provide Commonwealth Supported Places so that students are not charged with tuition costs to participate (Bennett *et al.*, 2018). Officially, enabling education programs are regarded as “a course of instruction provided to a person for the purpose of enabling the person to undertake a course leading to a higher education award” (Department of Education, 2023).

Because many students in these programs have experienced social marginalization and educational disadvantage, a critical pedagogy approach is deemed suitable to empower them to take agency of their learning (Freire, 1994; Shor and Freire, 1987; Stokes and Ulpen, 2015). Educators assist this group in developing academic language and literacies, fostering critical thinking within an inclusive environment as they prepare for undergraduate studies. The successful implementation of critical pedagogy in enabling programs has led to the development of a model known as critical enabling pedagogies (Stokes, 2021; Syme *et al.*, 2022; Bennett *et al.*, 2018; Hattam *et al.*, 2024). Critical enabling pedagogies foster inclusiveness, support, a sense of belonging, and a philosophy of care in students’ educational experiences. This approach is essential for students to feel safe and valued for their knowledge, which is crucial for their transition into university. Without the appropriate teaching methods, core academic literacy skills cannot be effectively taught. Students need to feel empowered and accepted to grow, develop new knowledge, and begin to understand academic culture.

There is considerable diversity in the curricula and content delivery amongst the 48 Australian enabling education programs (Pitman *et al.*, 2016). However, in general, the programs are designed upon a common mission to prepare students with the requisite academic literacy skills needed for university study within a supported teaching and learning environment. Typically, the programs offer a broad array of subjects, from general study techniques to specific degree preparation including instruction in academic writing, language development, library research, basic mathematics, study strategies, and specialised knowledge related to particular disciplines (Hattam *et al.*, 2024).

However, the emergence of genAI has necessitated a reconceptualisation of how academic literacies are taught in enabling pathway programs. GenAI is likely to maintain a

permanent presence in educational, professional, and societal contexts (Godwin-Jones, 2023). As such, university graduates will need to demonstrate competency in critical AI literacies. Consequently, educators must now consider how these literacies are taught and positioned within their programs.

Generative AI principles

This section outlines some principles we aim to follow as enabling educators seeking to address the challenges and opportunities of genAI. In our university, decision-making about genAI has largely been the responsibility of individual course coordinators, and so our approaches have emerged in the context of our specific courses whose subject matter is mainly English language teaching, information literacy, and digital literacy. Our approach largely aligns with a report published by Australia's Tertiary Education Quality and Standards Agency (TEQSA) which considers how assessment might be productively reformed in the context of genAI (Lodge *et al.*, 2023), so this is a useful starting point for establishing our approach. The report presents two guiding principles:

1. Assessment and learning experiences equip students to participate ethically and actively in a society pervaded with AI.
2. Forming trustworthy judgements about student learning in a time of AI requires multiple, inclusive and contextualised approaches to assessment (Lodge *et al.*, 2023).

These are followed by five propositions:

Assessment should emphasise 1) appropriate, authentic engagement with AI, 2) a programmatic/systemic approach aligned with discipline and qualification values, 3) the process of learning, 4) opportunities for students to work appropriately with each other and AI, 5) security at meaningful points across a program to inform decisions about progression and completion (Lodge *et al.*, 2023).

For the purposes of this paper, we are mostly interested in the first, third, and fourth propositions, as these are the ones we have more direct control over as individual educators. These propositions are valuable for informing our teaching practice and align with the approaches we have aimed to follow since ChatGPT's public launch in late 2022.

Consistent with the first and fourth propositions, we consider it important to allow students to use genAI authentically, where this is possible and reasonable. Our goal has been to find a balance between accommodating genAI use and maintaining the validity of assessments. This has required giving students clear guidelines for acceptable and unacceptable use of genAI in course work and assessments, and transparency has been crucial. Guidance on acceptable use must be nuanced and explained in relation to course learning objectives. For example, in a

written assessment genAI may be permitted as a tool to assist with brainstorming and to help clarify terms and concepts, but using it simplistically to generate the written content of the submission is not permitted because students would not be able to demonstrate their achievement of learning objectives. This transparency aims to reassure students about appropriate use while building their understanding of how genAI can potentially be useful as an assistive tool.

Simply allowing the use of genAI is not adequate on its own, as this technology is opaque and hard to understand. It is therefore vital to model acceptable use in formative activities to help build students' critical AI literacies. AI literacies is an emerging concept, with several review articles seeking to map out how it has been defined by researchers (Casal-Otero *et al.*, 2023; Long and Magerko, 2020; Ng *et al.*, 2021; Velandar, Otero and Milrad, 2024). The concept will continue to evolve with the emergence of genAI. In our teaching practice, we consider the development of critical AI literacies to involve knowledge and skills in how to use genAI tools for specific tasks, as well as knowledge of whether and why to use AI for these tasks – in other words, making sound judgements about its use. In addition, it includes developing knowledge of the broader contexts and impacts of genAI, such as interrogating ethical impacts (including on labor and the environment), algorithmic and data bias, the commercial interests of AI companies and how this fuels AI hype, and the impact of genAI on learning and creativity.

The third proposition is a longer-term goal – and perhaps a necessity – to reconceptualize assessment to focus more on the process of learning rather than seeking to infer a student's learning from a final submitted artifact. In many cases genAI has made it next to impossible for assessors to infer learning from that final product. In this new context, assessing the process of learning is both sensible and arguably a better approach to assessment regardless. One potential advantage of this approach is that instead of students focusing solely on the perceived “correctness” of a final product, assessment can be conceptualized as more of a “messy” process. This might include giving students opportunities to discuss and reflect on their learning. Essentially, assessments that allow students to submit work with the attitude of “This is what I want to show you” rather than “This is what I think you want to see” afford students more control over their learning.

These approaches of allowing genAI use where possible and helping students develop informed judgements about their use of it lead logically to a further principle we aim to follow as equity educators, but which is not addressed in the TEQSA document: that of supporting students' choices and agency. “Protecting human agency” is one of the measures proposed by

the United Nations Educational, Scientific and Cultural Organization (2023) in its genAI education policy guidance. The ultimate goal with developing critical AI literacies is not to have students simply follow educators' instructions but for students to make wise choices about whether or not to use genAI based on a solid and critical understanding of the technology and its relation to their work. It is therefore vital that student agency is supported, fostered, and respected, including possibly rejecting the use of genAI.

While these are all valuable principles, there are many challenges with following them. Some principles are in tension with others, and further tensions arise when genAI is introduced into specific educational contexts. To better explore the reasons for these challenges it is necessary to conceptualize genAI not simply as a technology but as a technology that exists within and acts on the social world. To this end, the next section discusses the notion of (gen)AI assemblage, a concept which encompasses the broader contexts of genAI use.

Gen AI assemblage

In the discourse of genAI in higher education, it is important to avoid any assumption that educators have free choice and control over its implementation and use. Since a great deal of the responsibility of navigating genAI's challenges has fallen on the shoulders of individual educators, this assumption would be pernicious, as though if we could only find the "correct" way of implementing genAI we could realize its benefits and avoid its pitfalls. In discussing some key tensions in the collision of genAI and equity education, this paper seeks to avoid treating genAI simply as a technology over which we have full control. Instead, the contexts into which genAI has been introduced are vitally important in understanding what educators and students can and cannot do with genAI, and the factors that might constrain people's ability to follow principles such as those outlined above. As Van Dijk (2020) explains, a dialectical view of technology holds that technology and society mutually shape each other, and that technology has both enabling and defining dimensions; that is, while people have some choices over the use of technologies, defining characteristics of the technologies also limit these choices. Importantly, this view of technology attends to the social contexts of their use.

Following from this, a productive way of understanding the array of challenges facing educators is to conceptualize AI not simply as a technology but rather as a technology that has particular effects on people and society when it is introduced into the world. Sociologist Simon Lindgren (2023), in articulating a "critical theory of AI", uses the notion of "AI assemblage" to conceptualize AI in this way. Drawing on definitions of assemblage from Deleuze and Guattari (2005) and DeLanda (2016), Lindgren explains how AI is a technology – or rather an array of

technologies – entwined with social and political reality. This requires seeing AI as socio-material interactions and arrangements rather than simply a technological artifact. As Lindgren (2023, p. 24) writes, “AI both consists of things, and does things”, and moreover does things to people and societies.

In mapping out AI assemblage, Lindgren (2023) identifies numerous “layers of AI” that include not just the technological elements of data, algorithms, machine learning systems and so on, but also power, ideology, social imaginaries of AI, political economy, labor, the environment, and more. This concept of AI assemblage is not only about the “meaning” of AI (various definitions, ideologies, and imaginaries) but also how socio-material reality shapes people’s interactions with it. In fact, as Lindgren has it, these social contexts are what gives AI its conceptual shape: AI is “defined by the complex sociopolitical settings where it comes into play and co-functions” (Lindgren, 2023, p. 25). Incorporating these contextual factors allows for a richer understanding of what AI is and does in the social world.

The purpose of leveraging this concept of AI assemblage in this paper is to consider how generative AI specifically, when it is introduced into educational settings, enters into particular sociopolitical arrangements that shape how genAI can be used, and which are in turn shaped by genAI. Using this concept, a student’s or educator’s interaction with genAI is understood as being enmeshed with the socio-material reality of the university and the world more broadly. This includes factors such as teaching arrangements, assessment design, assessment policy, pedagogical approaches, management structures, epistemological foundations, ideological stances, and so on. Instead of understanding genAI as merely its technological aspects, which can lead to the false notion that people have free will over its implementation, it is understood as an assemblage of socio-material forces that influence whether and how people engage with genAI, and the effects it has on them. By attending to these contextual factors and understanding genAI in this way, it is possible to identify the tensions and contradictions that emerge when genAI is introduced into educational settings.

Tensions in teaching and learning

The following two sections explore the tensions arising between the principles we aim to follow regarding genAI and the socio-material complexities that arise when genAI enters into educational settings. Existing teaching, learning, and assessment arrangements are part of the assemblage of genAI and must be accounted for in responses to its emergence. Keeping the imperative of equity outcomes foremost in mind, these sections consider the tensions between

the learning of foundational academic skills and critical AI literacies, followed by challenges that arise in redesigning assessments in response to genAI.

Foundational skills and critical AI literacy

Of the many contextual factors in the assemblage of genAI, one of the most pressing for educators, especially those in the equity space, is the socioeconomic circumstances of students. An immediate concern when genAI was made widely available is whether it would worsen digital divides between students (Capraro *et al.*, 2024). Given the claims that this new technology could potentially improve students' educational outcomes, would students be able to pay for more advanced tools and better outcomes? As AI and technology companies seek to recoup their extraordinary investment in the technology, there are likely to always be paid versions with more features or greater capabilities. This problem is unlikely to be solved even if universities provide their students with access to genAI tools. In the interest of equity outcomes, contextual issues such as socioeconomic circumstances must be carefully considered in any strategies to manage genAI's impact.

Furthermore, existing factors such as differing levels of access to and knowledge of digital tools and platforms can further exacerbate divides in genAI access. A study of differences in knowledge of ChatGPT among United States residents, based on search patterns, found that these differences appear to be proceeding along the same socioeconomic and demographic lines as other digital divides (Daepf and Counts, 2024). In this study, education level was the strongest predictor of search interest in ChatGPT. This seems to be a strong argument for introducing genAI and building literacies early in a student's education to mitigate the effects of a digital divide. However, the early integration of genAI is fraught with further challenges.

As outlined in the principles above, early engagement with genAI is necessary to help students build critical AI literacy so they can make wise choices about its use in university contexts. This involves developing evaluative judgements not only of AI output but also of the utility and propriety of AI tools (Bearman *et al.*, 2024), and this is surely of vital importance early in students' time at university to allow them to make informed decisions during their program. But there is a fundamental tension here. While much of the marketing of genAI suggests that these tools can "accelerate student learning" (OpenAI, 2024) and level the playing field among students, it has become clear that effective use of genAI requires sufficient domain-specific knowledge to form judgements about whether the output is suitable for the task. Students in pathway/enabling programs are still developing foundational literacy skills such as

basic academic reading, writing, and language proficiency. Mastering these skills is arguably necessary before students can meaningfully develop critical AI literacies. Warschauer *et al.* (2023, p. 3) describe this as the “with or without contradiction” in regard to second language learners: “the better students can write without AI, the better they will be prepared to write with it”. As such, students with higher levels of language proficiency stand to benefit more from using these tools, whereas students with lower language proficiency are at risk of becoming further marginalized and excluded. Students who are still developing foundational writing skills may become overly reliant on and trusting of AI-generated text for easy assessment completion, which compromises meaningful language learning and understanding of how to leverage AI tools for communication in professional contexts (Warschauer *et al.*, 2023). The same issue is found in other subject areas. Prather *et al.* (2024) found there is a risk of genAI widening the gap between “well-prepared” and “under-prepared” novice programmers. In their study, while genAI could accelerate the learning of the well-prepared learners, the under-prepared were less able to assess their own learning because genAI could exacerbate metacognitive difficulties as well as add new ones, such as instilling a false sense of confidence. Our own experiences have been similar: students who over-rely on genAI in their assessment work tend to do poorly, as they are usually unable to demonstrate the required learning outcomes assessed by the marking criteria. In other words, the students who need the most assistance are in fact most disadvantaged by their use of genAI because they struggle to evaluate the suitability of the output.

The key tension, therefore, is between the need for students to engage with genAI early to build literacies and the simultaneous need to develop their competencies without it. This is further complicated by the principle outlined earlier of supporting student choice and agency. In our own teaching, we have noticed a small but still significant number of students who are not interested in using genAI. In some cases this is simply because they want to do the work themselves and do not feel the need to use genAI for a given task. In other cases it is because they have ethical objections to using genAI. These ethical objectives are well founded, given the high energy and water requirements of AI tools, the exploitative labour practices used by some companies such as paying Kenyan workers a miserly wage to sort through horrendous AI output to further train the models (Perrigo, 2023), and the practices of some companies of collecting vast amounts of human creative work without permission or attribution. It would be remiss of educators to ignore the importance of these issues to students if they raise concerns on such grounds. Universities often stress the need to produce ethical graduates, and this is a notable test of the rhetoric. Ethical issues such as these should loom large in the work of equity

education, and students should be supported if they make ethical choices about their use of genAI.

Ideally an assistive tool like genAI should be able to scale along with a learner's skills and knowledge. But genAI exerts its strengths in the opposite direction: it is very good at imitating basic skills, potentially short-circuiting a student's learning, yet as a student's own capabilities increase in later years of study and into a career, genAI is less capable of meeting the higher expectations of quality in more complex, highly contextualized tasks. At that point, it would be vital for users of genAI to possess the knowledge required to evaluate the output and put it to use. As a result, a reliance of genAI early in a student's learning may leave them unprepared for more challenging study and work later. A possible response to this is that genAI will continue to improve over time and perhaps it will become more capable of performing those more complex tasks as well. Perhaps time will tell on this point, but for now it is a mere assumption and we must not gamble students' futures on it. It would be a perverse outcome if genAI is integrated into students' learning in the hope of narrowing gaps only for it to exacerbate existing inequities.

Assessment redesign and consequential validity

Many suggestions have been shared between educators about the best ways to approach assessment in the wake of genAI, including the TEQSA report (Lodge *et al.*, 2023) that aligns with the principles we aim to follow in our teaching. Our aim here is not to catalogue the vast array of possible strategies for redesigning assessments, but instead to argue that the challenges educators face with doing so are created by the introduction of genAI into existing pedagogical arrangements, assessment policies, and procedures. These are important elements of the assemblage of genAI in higher education. These contextual arrangements are what shapes how genAI can be used the effects that it has (Lindgren, 2023) and so any productive strategies must attend to these contexts.

Among the various suggested solutions for ensuring the validity of assessment in an era of genAI, some frequently-suggested options include more oral presentation components, including vivas and interactive oral assessments, and invigilated/proctored tasks. While these can be useful tools, they present still more challenges from an equity perspective. Most notably, these approaches imply face-to-face assessment. While they can be done virtually at a distance, the sophistication of synthetic voice and video generation tools now makes it possible to produce AI-generated answers in real time, making virtual oral assessment a challenge for the security of assessments. Remote proctoring may also face threats from these emerging

technologies. In any case, there is as yet not enough evidence of the efficacy of remote proctoring to counter various arguments against it (Dawson, 2024). If oral and invigilated assessment emerge as a common response to genAI, face-to-face therefore seems to be the preferred mode.

From an equity perspective, there are various tensions here. Most immediately, face-to-face assessment is contradictory to the trend towards more online and blended learning. In Australia in 2022, a significant proportion of university students, approximately 23.9%, were enrolled externally (Department of Education, 2024) meaning there is no requirement for these students to attend campus. Online learning allows for greater access to higher education for people not located close to a campus or whose life situations do not allow for easy access. This has great benefits in terms of equity, including for many students in identified equity groups such as those in our enabling education programs (Stone, 2022). Any assessment redesigns need to account for these different learning modes to preserve the benefits of increased access to higher education they afford.

An additional issue that can result from these attempts to secure assessments against genAI is a potential narrowing of assessment types across a program of study. One purpose of implementing a variety of assessments across a program is so students are not unfairly disadvantaged by an over-emphasis on assessment types they struggle with. If the response to genAI is to assign more high-pressure tasks like oral assessments and timed invigilated tasks, there is a danger that the range of assessments is narrowed to the detriment of some students. From an equity perspective this would be an unacceptable outcome.

A useful concept for thinking through responses to genAI in assessment design is consequential validity, which refers to “the implications of the assessment on what students do” (Dawson *et al.*, 2024, p. 8). This means considering the consequences of assessment design beyond the narrow aim of assessing a student’s performance in a task (Sambell, Mcdowell and Brown, 1997). If strategies for managing genAI lead to a narrowing of assessment types clustered around oral and invigilated assessment, this presents a problem in terms of consequential validity, as students are not given an array of assessment tasks to demonstrate their strengths.

Consequential validity, as a concept, can be a useful guide for other assessment redesign options as well. Returning to the principles we aim to follow in our teaching outlined earlier, assessing the process of learning rather than the final product has been suggested as a response to genAI invalidating assessments (Lodge *et al.*, 2023). This is a promising direction for assessment even regardless of genAI’s influence. However, care must be taken in the

implementation. Assessing the process of learning implies much better knowledge of students than is typically the case currently, and so this principle can easily dovetail with another trend, that of increased data collection, surveillance, and thus control of students' learning (Popenici, 2023). From the perspective of consequential validity, it will be important to consider the implications of this. Strategies that lead to more surveillance and control are clearly in tension with critical pedagogies that aim to empower students and give them control over their own learning. Here again, it is important to conceptualize genAI as an assemblage and factor in the broader contexts, including the institutional and pedagogical, in any assessment strategies.

While there are of course many possible approaches to assessment redesign in response to genAI, the argument advanced here is that these approaches must be responsive to the pedagogical context genAI is entering into. Our overriding concern with critical enabling pedagogies, with a focus on equity outcomes, means that many proposed approaches to managing genAI in assessment result in tensions or contradictions that are difficult to reconcile, presenting consequential validity problems vis-à-vis an equity agenda. In any case, regardless of discipline and specific student cohort, it is important for pedagogical principles to guide any responses. The alternative is a surrender to technological determinism: an intolerable situation in which genAI dictates pedagogies rather than the other way around.

Knowledge, justice, and equity

The following sections expand the analysis of tensions to explore some issues that are less obvious in everyday teaching practice but are nonetheless highly significant for educators with an equity focus. Following the declaration by Crawford (2021, p. 19) that “artificial intelligence is now a player in the shaping of knowledge, communication, and power”, an important question is how generative AI shapes knowledge production and how this may affect an equity agenda in education. In particular, these sections focus on how the design and function of genAI models have limitations that place them in tension with the pursuit of equity.

Knowledge and algorithmic exclusion

It is perhaps an obvious point to make that the pursuit of just and equitable societies requires changes to unjust and inequitable ones. Structures and ideologies that reproduce injustices must be dismantled and alternatives built. This requires alternative ways of seeing the world, reimagining it, and realising it. The operations of AI – the neural networks, the deep learning architectures, the statistical weightings, and the reliance on pre-existing information

that comprises the training data – represent a danger in this regard. The way AI abstracts the world as data and seeks patterns and predictions from this data means that AI modelling “becomes a rearrangement of the way things have been rather than a reimagining of the way things could be” (McQuillan, 2022, p. 43). Similarly, Bender *et al.* (2021) discuss one of the challenges of language models being “value-lock”, whereby changing societal values are not – and cannot be – accurately captured by models that rely on past data. Such a technology presents a risk of “epistemic anachronism” (Wihbey, 2024). This is of particular concern where algorithmic systems are used for social governance purposes such as in welfare, health care, education, and criminal justice systems (Eubanks, 2018; Katz, 2020; Noble, 2018). But we also need to confront the fact that AI’s “innate conservatism” (McQuillan, 2022, p. 43) will manifest in some way with generative AI output as well.

This fundamental limitation of genAI can be difficult to spot in everyday use, but it is this surreptitious nature of genAI’s operations that make it all the more important to interrogate. It is more obvious with image generation tools which, for example, when prompted to create an image of an architect might produce numerous images of similar-looking middle-age white bearded men. It is often less obvious with text output but certain “biases” like this will be present nonetheless, reproducing hegemonic values, identities, and cultures and de-emphasising or erasing others (Gillespie, 2024; Laywine, Simon and Sinnreich, 2024). This can be called bias, although Albert and Delano (2023) argue that “algorithmic exclusion” is a better term as it signals that these effects are produced by the machinic operations of algorithmic systems rather than some outside source of bias that could be identified and somehow “fixed”. AI companies may intervene and “fix” the problem of the white bearded architects by adding some hidden guardrails, but this is an endless game of whack-a-mole to address problems constantly produced by opaque generative tools.

AI systems produce knowledge through these representations or exclusions of people, values, and cultures, but they also reproduce particular ways of knowing. The epistemological foundations of deep learning systems involve abstracting the world as data in order to find statistical patterns. The efforts to simplify and categorize the world in this way, via the supposed objectivity and rationality of data, is characteristic of Western knowledge systems. At a time when there is increasing emphasis placed on “decolonising the university” and the curriculum (Bhambra, Gebrial and Nişancioğlu, 2018), it is important to consider how AI may work against this goal. Birhane and Talat (2023, p. 137) argue that “machine learning stands in stark contrast to decoloniality” because the necessary deep understanding of historic injustices and the work required to decentre Western ways of knowing runs counter to AI’s processes of abstraction.

The machine learning operations of genAI therefore place it in tension with decoloniality. If universities are to genuinely pursue decolonisation it will require dismantling Western colonialist practices, which among many other things requires avoiding the further imposition of Western epistemologies by hegemonic power structures. GenAI, meanwhile, is a technology that aims to provide fast and simple answers to even the most complex questions by converting the infinitely complex world into datapoints for processing. While this technology is well suited to an epistemology that favours simplifying the world, alternative ways of knowing such as Indigenous knowledges may embrace complexity and relationality (O'Brien and Watson, 2014). In this way, genAI appears to be at odds with knowledge systems that are not aligned with its operations. The necessity of reckoning with historic (and ongoing) injustices is an even more straightforward contradiction: some of these injustices have been barely told or not at all, so any AI tool that relies on pre-existing information to function is utterly unsuited to that task. The central point here is that genAI's inability to reimagine the world in new ways makes it a tool for the perpetuation of dominant knowledges and structures, positioning it against the aims of equity education.

While this sounds like a grim conclusion, Birhane and Talat (2023) offer some hope here by showcasing the reclamation and revitalisation of the Te Reo Māori language using natural language processing technology, a project conducted by and for the Māori community. For equity educators, a hopeful lesson to learn from this project may be that AI systems such as genAI do not need to be at odds with an equity agenda so long as they are used with a clear purpose, for the benefit of users, and with a willingness to resist their tendency to reproduce hegemony. This may offer some useful direction for educators in incorporating and managing genAI in their teaching. However, this does require a clear understanding of how AI systems operate to produce knowledge.

Knowledge and nonknowledge

A major hindrance to managing the issues outlined above is understanding when, how, and why AI tools have produced their output. While there is ongoing research on “explainable AI” (Khosravi *et al.*, 2022; Saeed and Omlin, 2023), such efforts encounter a significant tension. As McQuillan (2022, p. 31) notes, there is “a trade-off between accuracy and explainability”. More complex deep learning systems generally produce more accurate results, but this increased complexity makes it increasingly difficult to explain *how* those results were

produced. Beer (2023) describes this as the tension between the knowable and the unknowable in algorithmic thinking: the pursuit of more knowledge leads to more complexity which leads to “nonknowledge”. Here is a key paradox: genAI is proffered as a tool for acquiring knowledge, and yet the trajectory of its development – towards more complexity – necessitates “the making of mysteries” about how it functions (Beer, 2023, p. 100). Moreover, this is not an undesired consequence. Beer (2023) argues that the authenticity of deep learning systems depends on this unknowability. It is the lack of knowledge of genAI’s operations that makes its output appear, at first glance at least, so magical. It is vital to grasp the danger of this dynamic. If unknowability lends more authenticity to deep learning systems, this can then justify the trajectory towards still more complexity at the expense of explainability.

A consequence of obfuscatory AI is that the imagining of alternative futures, which is necessary for the pursuit of justice, becomes more difficult. As an array of technologies that function through a process of datafying, abstracting, and categorising the world and finding statistical patterns in what results, AI is incapable of identifying social injustices and their causes in the first place, as this requires the human experience of living in the world and a commitment to political action. The implication for genAI systems is that, at best, they can identify proxies of injustice in response to user prompts – that is, statistical representations in data might output an imitation of concern for justice – but they do so with no understanding of what the injustice is or why it matters. This is a crucial point for educators committed to equity outcomes: the political work of identifying injustices and imagining alternative futures cannot be achieved with AI tools whose reliance on past data inherently reproduces hegemonic knowledge. In practical terms, this means being discriminating about the use of genAI in curriculum content and an awareness of the hegemonic nature of these tools. For these reasons, dialogic and democratic pedagogies that centre the lives, perspectives, and aspirations of learners are necessary as a method of resistance to the stultifying effects of AI.

The key point here is that genAI and other algorithmic systems have inherent characteristics that tend to work against an equity agenda in education. This is not meant to suggest there is no place at all for genAI in programs with an equity focus. It is important to avoid a determinist view that genAI imposes its effects in one direction, which would lead to a binary choice of either embracing or banning it. It is conceivable that genAI can be used productively as a tool in educational settings without the oppressive effects of algorithmic exclusions and calcified value systems. Indeed, coming back to one of the core principles noted earlier, it is important to incorporate genAI in students’ education to develop their literacies with this technology. However, the “inbuilt political commitment to the status quo”

(McQuillan, 2022, p. 43) characteristic of AI systems does create tensions that educators need to be keenly aware of in order to navigate potential pitfalls. This must involve instilling key principles such as avoiding an over-reliance on genAI in educators' curriculum development and students' learning. The development of critical AI literacy among staff and students – that is, developing informed understandings of genAI's operations and developing judgements about whether and how to use it for specific purposes – is vital to preserving the aims of equity education. There always remains room for resistance to the oppressive effects of algorithms (Bonini and Tréré, 2024). Such resistance is necessary to preserve the principles of student equity and social justice.

Conclusion

In raising these tensions and contradictions, the hope is to find ways to navigate them and preserve the goals of equity education. However, as implied by the understanding of (gen)AI as assemblage, this difficult task must not be left up to individual educators. The complexity of AI systems, the specialist knowledge required to understand their operations, and moreover the deep unknowability of algorithmic operations (Beer, 2023), means many educators will struggle to identify and counter any negative outcomes. As Stephenson and Harvey (2023) have argued, there must be institutional oversight built into universities' policies and practices. It is the assemblage of genAI, including these institutional contexts, that result in these tensions and so they must be addressed on an institutional level.

This still does not tell the full story, however. Simply seeking to better understand algorithmic systems is not enough to avoid inequitable outcomes. The tensions resulting from the introduction of genAI into higher education emerge from socio-material complexities far beyond the control of individuals or singular institutions. Some of these contradictions stem from the inherently conservative operations of AI, others from the ideologies, epistemologies, and materialities that structure our societies. In this context, trying to mitigate the negative consequences of such a disruptive technology through curriculum or assessment design alone is an absurdity.

Returning to the illustrative example of Te Reo Māori revitalisation efforts (Birhane and Talat, 2023), one path forward may be advocating for AI models and tools that are democratic and transparent in their *application* and *purpose*, if not their precise operations. This means AI that is under the control and direction of users, and which is used for transparent, specific, and beneficial purposes. Currently, the development of genAI looks very different. It is an arms race of bigger models, more data, and more compute power among for-profit competitors, and

their marketing positions the technology as general purpose “intelligence” whose inscrutability is meant to be taken as a marker of authenticity. Advocates of democratic and transparent AI must resist this trajectory. If we take the goal of equity education to be human liberation (Freire, 1994), there are serious questions to ask about how the operations of genAI impact upon this goal. The opaque recapitulation of existing knowledges stands in contrast to the exploration of new ideas with the goal of liberatory outcomes. Solutions to the tensions raised by genAI in higher education will be difficult to find and implement, but conceptualising genAI as an assemblage of technological, social, political, and epistemological arrangements helps to identify the sources of these tensions, which is necessary for meaningfully addressing them.

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