

ASCILITE 2023

People, Partnerships and Pedagogies

The implications of generative AI for creative composition in higher education and initial teacher education

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This position paper explores the impact of generative AI on creativity and creative production in higher education, with focus also on initial teacher education. Creative outputs are an essential part of the business of higher education across different disciplinary areas, along with pedagogical and assessment practices matched to these outputs. However, the advent of generative AI has sparked a reconsideration of how we think about creativity, creative output, and the hybridity of relationships between generative AI and humans in creative endeavours. This emergent technology also has significant implications for teacher education and for the develop of new teachers who need confidence with using AI in learning contexts. We suggest that new thinking and critical dialogue are essential in developing educational futures in which generative AI is understood for its affordances, limitations, and dangers.

Keywords: generative AI, creative production, higher education, initial teacher education

The rapid emergence of generative artificial intelligence (AI) has potentially afforded new approaches to and possibilities for creative output in higher education (Tzirides et al, 2023). These possibilities and approaches are still in their infancy, and it is crucial that academics and policy makers consider critically how generative AI relates to the core business of higher education. Popular media have represented this innovative set of technologies with notoriety as being highly disruptive across society, if not dangerous in its potential to bring unwanted change and education and work (Heaven, 2020). The recent Hollywood strikes by writers and actors in the US have partially been driven by opposition to the potential of generative AI to diminish the work of creative professionals.

AI's capabilities have proliferated in the last several years to encompass now creative domains of output such as poetry, art, music composition, design, assignment generation, and storytelling (Humble & Mozelius, 2019). This development, which is especially connected with generative AI, may have profound implications for both higher education and initial teacher education, reorienting the landscape of creative production and the pedagogies and assessment practices that support that production (Hao & Yunyun, 2023). Technologies have always had a significant place in creative production, including the assignment work of students, but arguably generative AI is taking this support to another level in providing substantive and novel content. This being the case, educators and policy makers in higher education need to critically rethink and new perspectives about what generative AI means for the learning and assessment of students.

Implications for creative output in higher education

The advent of generative AI and its impact on what is produced in higher education (by students and academics) is beginning to significantly affect what we mean by the notion of creative production and the ways in which AI-based technologies integrate with human creativity. OpenAI's GPT, building on previous generative AI models, has shown an increasing ability to generate coherent and contextually relevant narratives, compositions, artwork, scripts, and poet texts, creating outputs that have human-like creativity (Brown et al., 2020; Mazzone & Elgammal, 2019). In many creative tasks, students in higher education can leverage AI to generate new ideas, draft content for assessment activities, design tasks and refine their writing and compositions, potentially making the creative process more efficient (Lim et al., 2023; Williams, 2023). It is highly likely that generative AI will create possibilities in creative production and idea generation that might not exist otherwise. Generative AI, in its creative capacity, seeks to replicate this human capacity by generating original and innovative content. The algorithms are trained on vast datasets to learn patterns and create new, imaginative outputs. A significant point is that GAI simulates human speech patterns from existing linguistic resources but is not human (Baidoo-Anu & Owusu Ansah, 2023). It has no stable worldview or belief system. With generative AI, this output can be autonomously generated without direct human intervention, leading to opportunities and challenges in the creative industries, and in education at all levels.

While this capacity may augment human productivity, it also raises practical and ethical questions about authorship and ownership of work (Craig, 2022), and thus prompts questions about assessment and how the input of generative AI should be understood. If students leverage AI in their creative process, can the resultant output be considered authentic or genuine? Indeed, does it have the same legitimacy as a creative product produced only through human creativity. Shneiderman (2007) argues that creativity is a distinctively human quality that includes not just the final product but also the process that led to the outcome. If generative AI becomes a 'living' agential participant in that process, the evident distinction between the creativities of human and machine become difficult to determine, perhaps complicating the final evaluation of creative output and assignment work in higher education environments. Perhaps what is evolving in this space is a hybrid creativity in which generative AI is partnering with human creativity in ways that go beyond what has been previously operative in human-technology productive environments in higher education (Peeters et al., 2021).

This supposed blending of human and AI creativity evokes critical questions around plagiarism and intellectual property, so that ownership may become a significant issue. Lomas (2015) notes, however, that there is no legal precedent for ascribing authorship to AI, and higher education students using AI in their creative process might unintentionally wander into uncertain ethical and legal territory. On the other hand, perhaps the ways that we see creative production and the nature of authorship might need critical re-examination in light of the changing technological environment that affords deep hybridities between humans and generative AI. Also, conceivably, the growing autonomy and agency of AI needs to be factored into how we consider creative output. Posthuman thought points to creativities and potentialities beyond the human Anthropocene (Schober, 2022). These considerations are likely to have an impact on the ways that assessment is conceived and practiced across many disciplines in higher education. This is not to ignore the genuine concerns with the potential for over-dependency of students in deploying generative AI as a creative partner in their compositional work. Despite the perceived and proven limitations about what AI can do in collaboration with humans, new possibilities might be given birth. Hybrid collaborations between generative AI and humans might deliver unprecedented creative outputs in what might be considered postmodern junctures of possibility (Banks & de Graaf, 2020).

Issues for initial teacher education

For initial teacher education, the expansion of generative AI creates both challenges and opportunities. Pre-service teachers (and the teacher educators who work with them) might need to understand AI's affordance, limitations, and dangers to successfully integrate it into teaching practices (Trust et al., 2023). They might experiment with new pedagogical approaches and strategies for using generative AI as a relational technology that works alongside and perhaps ahead of humans to facilitate creative expression in all its modes and genres without diminishing the value of human creativity and the authenticity of work. This may include creating explicit guidelines for AI use and developing assessment criteria that balance the contributions of AI and human effort. Given that pre-service teachers will go out into the teaching profession where there is uncertainty about the place of generative AI in teaching and learning, this critical engagement with AI becomes all the more important.

Within teacher education programs generative AI has the potential to broaden the scope of teaching and learning towards new educational futures. It can transform the learning process and offer new ways of producing content and interacting with learners. Teachers can work with generative AI to create curriculum content, generate new ideas, research, build resources and produce lessons that are adaptive to students' learning needs. Generative AI, therefore, can serve as an invaluable teaching aide or digital tutor for demonstrating the creative process, providing real-time, adaptable examples of, for example, narrative constructions or artistic expression. Educators in higher education might also design generative AI to create highly personalised and engaging learning resources that potentially can enhance the teaching and learning experience (Luckin et al., 2016).

Clearly the obligation is on academic leaders and policymakers in initial teacher education to critically appraise the use of generative AI in education, but an appraisal that does not buy into popular dystopian discourses about the effects of AI in higher education that are not useful in taking the debate and research forward. According to Buckingham (2020), there is a need for a more sophisticated understanding of AI's role in education that includes the development of a balanced scepticism about its capabilities and limitations.

Generative AI, with its groundbreaking capabilities, is steadily permeating the educational landscape. However, its integration into educational content brings forth several pressing concerns. Zaglas (2019) rightly highlights the potential risks of an over-reliance on AI, suggesting that it could engender an excessively uniform educational approach. Such standardisation could inadvertently curb students' creativity and hinder the

development of their critical thinking abilities.

Furthermore, we cannot merely embrace generative AI without thorough scrutiny of its implications. A study by Williamson et al. (2020) emphasises the paramount need to address ethical dimensions, encompassing data privacy and the ever-looming threat of algorithmic bias. These considerations underscore the fact that technology, while transformative, should be harnessed with vigilance.

Additionally, a future where AI dominates educational settings may have unintentional ramifications. Devi & Roy (2023) express reservations about the potential erosion of the educator's role. Such an evolution may compromise the invaluable human interactions that significantly enrich the educational journey. In essence, while generative AI offers a plethora of benefits for education, its deployment requires a balanced and reflective approach, ensuring that technology augments, rather than supplants, the multifaceted dynamics of learning. More work into how AI is used is needed, and with some urgency. It is reasonable to suggest, therefore, that as we harness AI's potential, we must ensure that it supports rather than supplants human creativity, fostering an enriching, equitable, and ethical learning environment.

Discussion and conclusions

In conclusion, the arrival of generative AI might be understood as a paradigm shift in the how we understand of creative output in higher education and initial teacher education. It incites us to rethink conceptualisations about creativity, pedagogy, and assessment. We believe that there is need for critical dialogue and research that engages with the possibilities that come out of the intersections of human and machine creativity. One of these possibilities is the wholesale reconsideration of assessment practices in light of the hybridities possible between AI and human creativity. While AI-based grading systems can streamline assessment processes, optimising educators' time and resources (Chhatwal et al., 2023), we must ask whether these processes represent considered reflective practice for both the teacher and the student. Understanding that feedback and assessment influence both the learner and the learning, generative AI may push teachers towards more innovative assessment practices sooner than they may like.

We suggest that new understandings need to emerge that are adaptive to the technology, ones that conceive of the possible hybridities that might ensue as generative AI becomes more central in creative practices and in the outputs and assessment practices that are emerging in higher education. Clearly, there is tension and a delicate balance between AI's creative and compositional potential and concerns about the loss or diminishing of human creativity that has been of concern among administrators in higher education and echoed in the popular media. We propose that there is a need to explore this tension and investigate how to balance the human-machine compositional relationship before rushing into policy and practice determinations.

Generative artificial intelligence (AI) has ushered in a new era for creative production (Anantrasirichai & Bull, 2022), prompting a re-evaluation of the traditionally understood dynamics between machines and humans in the realm of creativity. As generative AI's computational capacities expand, it becomes increasingly bound to creative processes, from industry applications to academic research and educational possibilities (Anantrasirichai & Bull, 2022). However, this burgeoning relationship is not without challenges. Integrating AI in creative outputs presents pressing concerns regarding privacy and intellectual property (Dwivedi et al., 2023). For instance, if a piece of content is co-created by both humans and AI, who owns the rights to it? Who then might claim the right to redistribute or repurpose the creative output?

As governments grapple with the ethical and legal challenges posed by generative AI, it is imperative that policies are crafted with a keen focus on the creative products that emerge from these systems. However, it's equally important to delve into the creative processes behind them, understanding not just the end result, but also the methodologies and mechanisms that lead to these outputs.

Generative AI, a ground-breaking advancement in the realm of technology, presents both opportunities and challenges, especially when considering its applications in education and creativity. Historically, creativity has always been revered as a quintessentially human endeavour, a testament to our innate ability to innovate and think outside the box. With the advent of generative AI, this narrative is facing potential upheaval, ushering in a new era of machine-generated creativity. Teachers and creatives alike will be forced to question what is 'real' and what is not as AI accelerates in efficiency and in accuracy.

While there's no denying the utility of such AI in educational and creative fields—providing vast amounts of data, simulating countless scenarios, and possibly even offering fresh perspectives—it is essential to be critical

of its limitations. One prominent concern is the debate surrounding authenticity and originality in AI-generated works. As cited by Gillotte (2020), there's a growing discourse about whether creations borne from algorithms can genuinely mirror the depth, nuance, and unpredictability of human creativity. Can a machine, regardless of its programming sophistication, truly replicate the spontaneous bursts of inspiration characteristic of human beings? While Generative AI offers a valuable toolkit for enhancing education and creativity, it remains a flawed instrument. To fully harness its potential without compromising the essence of human creativity, it is crucial to approach it with a discerning eye, appreciating its benefits while being wary of its shortcomings.

Alongside this exploratory paper, we are undertaking a research investigation through a collaborative autoethnographic inquiry approach to explore the intersection of creativity and computer-generated art using generative AI (Chang et al., 2016). We will delve into the confluence of generative artificial intelligence and evolving creative domains. A primary emphasis will be discerning the potential collaborative dynamics between humans and emerging machine intelligence. Merging anticipated theoretical paradigms with forward-thinking experimentation, this study aims to uncover the nuanced facets of authorship, ownership, and the pioneering capacity of AI to reshape the landscape of creative practices. As we project forward, the insights from these inquiries could revolutionise educational methodologies and paradigms, offering a fresh perspective on how future generations interact with and leverage technological advancements. The ramifications of these shifts could profoundly influence the realm of creativity and the broader societal and educational contexts in which this synthesis of human-machine collaboration occurs. This future holds both promises and challenges that we are only beginning to comprehend.

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