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### Who authors learning? Teaching design with intelligent technology

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#### Abstract

African philosophies of Ubuntu prioritise humanising the community of learning. Contextualising Ubuntu within the emerging Fifth Industrial Revolution (5IR) creates a tension between algorithms and the craft of design scholarship. The effect of the 5IR, while being more human-centred, is also unpredictable in terms of how technology replaces or automates human activity. This has led students to use technology tools to shortcut or circumvent activities that result in deep or transformative learning. Within the context of design education, this threatens the aptitudes and dispositions needed for engaging with the design process with the goal of establishing critical and creative authorship. The threat of automation has destabilised learning systems and structures to the point where such authorship holds the possibility of being appropriated by artificial intelligence (AI). The challenge for educators is how do we create the curricula, material, and learning activities that interpolate students to actively engage in the processes of learning.

This paper draws on post-structural paradigm as it seeks to reposition the formative debates around the perceived threat AI poses to learning, taking cognizance of the ethical concerns regarding authorship, and developing the capacity for creative and cognitive authorship across the various design disciplines. Where AI, such as ChatGPT or Google's Bard, surveys the known in order to respond to queries and seems to imitate to create. However, the requirements of learning activities such as research or creation/design forge a path through the unknown, using technology as a tool rather than as a substitute for human activity. The paper will offer reflection as discourse on how to reorientate one's practice against the cardinal framework of teaching and learning in design education. It concludes that cardinal directions embedded within human-centred learning, Ubuntu philosophy, and the criteria for authorship, despite the disruption of AI, still orientate towards the primary goal of student learning.

**Keywords:** Authorship, design education, human-centred learning, Ubuntu.

#### Introduction

The term artificial intelligence (AI) may be defined as “the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings” (Copeland 2023). Much of what we understand about the potential of AI is derived from the work of Alan Turing (1950, p. 435), who famously defined the discipline of AI as “an imitation game”. The development of smart algorithms, chatbots, and even voice-activated virtual assistants has laid the groundwork for increased human-technology interfacing in our living, working, and learning (see, for example, Sidley 2023 and Ormond 2023).

The return to a more “normal” classroom after the COVID-19 pandemic has been re-disrupted by the public release of generative AI. The ongoing debates, fears, and discussion continue as the capabilities

of generative AI is explored and tested, and further developed. In many disruptions, some faculty remain reactive and uncertain about how to incorporate growing technology disruptions within their practice in a consistent, adaptive, and academically credible way. This paper will offer exploration and reflection as discourse on how to reorientate one's practice against the cardinal framework of teaching and learning in design education. The aspirations of developing future designers, triggering student learning and professional practice in an African context, are held as fundamental to this paper.

## Methods

The paper draws on Post-Structuralist Theory to determine the impact of AI on teaching and learning in design education. Where structuralism proposes an inflexible distinction between, and hierarchical organisation of, phenomena, post-structuralism destabilises such notions by disrupting the influence of boundaries and hierarchies. Gilles Deleuze and Félix Guattari (2004) propose how post-structuralism aligns with the cardinal framework necessary for mapping the teaching and learning journey that education systems are traversing. Kairiené advocates for Deleuze and Guattari's (2020, p. 104) approach that challenges fixed notions of subjectivity and hierarchy in proposing a nomadic, rhizomatic form of thinking that reimagines stakeholder roles in teaching and learning. Deleuzian logic, therefore, no longer regards higher education as exclusive, but rather as part of a multifaceted collection of meaning-making systems (Kairiené 2020, p. 106). Consequently, AI disruption allows stakeholders to navigate multiple learning journeys simultaneously (and collaboratively) but offers little sense of certainty of location or direction.

Post-structuralism further assumes that agency is important for the learning, well-being and relationships of educators and their students. In addition, Heikkilä (2022) characterises professional work as requiring agency to be enacted within one's domain of expertise. Thus, professional agency, within the context of teaching and learning, relies on purposeful direction, stability, and the power to act and choose actions that result in achieving outcomes through learning. Significant disruptions – like the COVID-19 pandemic or new technologies such as generative AI – seem to threaten both well-being and agency because choice becomes constrained or reactive. However, post-structuralism questions the assumption of professional agency as resting squarely on the shoulders of the individual educator and claims a more entangled and relational approach (Heikkilä 2022). This approach aligns with the African philosophy of Ubuntu, as expressed by authors like Waghid (2020). Teaching and learning that is informed by Ubuntu includes balancing concepts of human interdependence and humaneness with practices that result in purposive, responsible, collaborative, and mindful activity (Waghid 2020, p. 1).

As design faculty seeking to incorporate practices of professionalism, agency, and accounting for practice in our own narratives, we explore the discourse and evidence around recent developments of generative AI and the potential impact on the practice of design education. As faculty, we hold space for responsive, reflective practice and emergent thinking from a human-centred learning approach in an African higher education context. How the cardinal values of education are lived out in teaching and learning practices in a consistent, adaptive, and academically credible way remains an ongoing dynamic dialogue in the scholarship of teaching and learning.

## Incorporating Ubuntu principles within the context of the Fifth Industrial Revolution (5IR)

Industrial Revolutions, largely through technology<sup>1</sup> changes, are characterised by a fundamental change in how we live, work, and relate to one another. The Fourth Industrial Revolution (4IR), first

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<sup>1</sup> Technology here is used in the sense of tools and techniques, i.e., “scientific knowledge used in practical ways in industry” (Oxford Learner's Dictionaries 2023)

defined by Schwab (2016), is still diffusing, and emerging as disruptive and converging technologies throughout African economics. While there is no single or definitive narrative of the 4th IR in Africa, reflecting the diverse needs and aspirations of African people and communities, there are calls for more inclusive and participatory approaches to Africa's participation in the world economy (see, for example, Yende 2021). There have always been concerns that Africa may "lose its sovereignty and identity in the face of globalisation and digitalisation", as a type of neo-colonisation. Still, the new 4IR raises many questions about how human-beneficial the new IRs are, given the sustainability concerns, employment changes, exploitation and widening inequality evident and the digital divide. For example, Authors like Khoa, Gip, Guchait, and Wang (2023) have described the rise of robotisation in the hospitality industry, in which a key consideration is whether competition (i.e., robots take over all human tasks) or collaboration (i.e., humans collaborate closely with robots to perform work better) will define the future. Similar discourse pervades discussions regarding AI, with several raising concerns about AI displacing humans in jobs and enabling students to engage AI in completing assessments in ways that put Academic integrity at risk.

Ubuntu is an African philosophy that emphasises the interconnectedness of humanity and the importance of community. It is often translated as "humanity towards others" or "I am because we are" (Kotze 2023; Jahnke 2021). The philosophy of Ubuntu has been applied to many fields, including politics, education, and technology. In recent years, there has been growing interest in applying Ubuntu to AI (Jahnke 2021). The conceptual approach is that AI should be designed to reflect more inclusive human values and promote human well-being (Mhlambi 2020; 2023; Jahnke 2021). Sabelo Mhlambi (2020, p. 1) argues that the traditional Western view of personhood is based on rationality and that "truth could be rationally deduced through formal rules of logic". This Western approach has largely informed the development of AI, and therefore, perpetuates individualistic approaches (humanness as the individual's ability to arrive at the truth by logical deduction). The outcome of this philosophy leads to a competitive approach "to build a machine that would match or surpass humans in reasoning or rational thinking" (Jahnke 2021). In contrast, Ubuntu, which is the basis of African philosophy, defines a person from the perspective of their social relationships, as "fundamentally relational", where "a person is a person through other persons" (Mhlambi 2020, p. 3).

The Fifth Industrial Revolution (5IR) is often positioned as encompassing the notion of harmonious human-machine collaborations, with a specific focus on improving the well-being of the humans affected by the 5IR. From discussions on climate change to health, authors like Noble et al. (2022, p. 199) argue that this creates a path for "a (r)evolution in thinking about and leveraging human-machine collaborations for greater societal well-being". In truth, these types of discussions of the 5IR remain aspirational and hopeful. In this discourse, the emergence, and applications of generative AI remain optimistic, focusing on the as-yet unrealised potential to improve human-technology collaborations. Incorporating the values of Ubuntu would align with these aspirations as we as Africans seek to influence the 5IR emergence in Africa.

## Perceived threats and opportunities from AI disruption

All industrial revolutions include shifts in jobs. Ormond (2023) cites an IBE (2021) survey, which found that 62% of South Africans expressed concern that AI would lead to unemployment. This and concerns regarding academic integrity and authentic assessment remain the most significant perceived threats from AI disruption.

OpenAI (2022) has been developing GPT (generative pre-train) since 2018. Since its launch in November 2022, ChatGPT-3 reached 100 million active users in January (OpenAI 2022), just two months after its release, making it the fastest-growing consumer app in history.<sup>2</sup> Since then, GPT-4 has been integrated into a variety of platforms and applications, including websites, messaging apps,

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<sup>2</sup> OpenAI's GPT-4 is the largest language model created to date and was released on March 14 2023.

virtual assistants, and other AI applications. This release of ChatGPT-3 accelerated the release of Microsoft Bing and Google's Bard. Ormond (2023) points out that all technology has unforeseen consequences, and that AI is not a public good, as it is developed by corporations for profit. Actively engaging with and shaping the implementation of new technologies seems key to harnessing the potential benefits. With the distribution of new generative AI technologies, such as ChatGPT, Bard, and Bing, feedback loops, and experimental opportunities are available. OpenAI (2022) publicly discloses limitations to ChatGPT and states, therefore, that it released ChatGPT to get users' feedback and improve the moderation of their AI.

Mollick and Mollick (2022, p. 1) were among the earliest educators to argue that "AI can be used to overcome three barriers to learning in the classroom: improving transfer, breaking the illusion of explanatory depth, and training students to critically evaluate explanations". Baidoo-Anu and Owusu Ansah (2023) point out that the ability of ChatGPT to perform complex tasks within the field of education has caused mixed feelings among educators. The perceived competence of ChatGPT-3 on certain examinations (Terwiesch 2023) has caused consternation amongst some academics. Still, we agree with Oppenheimer (2023) that while AI like ChatGPT could make it easier for some students to cheat, "it doesn't fundamentally change the integrity dynamics in higher education".

Baidoo-Anu and Owusu Ansah (2023, p. 1) argue that the potential benefits of ChatGPT include but are not limited to the "promotion of personalised and interactive learning, generating prompts for formative assessment activities that provide ongoing feedback to inform teaching and learning, among others". Yet these authors also point out some inherent limitations in the ChatGPT AI, such as generating wrong or fabricated information, biases in data training, which may augment existing biases, privacy issues, among other elements. Several authors, including Mhlangu (2023), argue that the use of ChatGPT in education requires respect for privacy, fairness and non-discrimination, and transparency in the use of ChatGPT.

## Authorship and AI

The first cardinal value relates to authorship, and the potential for collaborative authorship. In weighing the degree to which AI establishes itself as coming alongside human endeavours in multiple contexts, and in light of the perceived threats and opportunities outlined above, one of the key considerations relating to creative and critical outputs is the question of authorship. Debates concerning authorship have extended across a spectrum from the philosophical to the legal, and some of these will be highlighted here as they frame the intrinsic need to validate the products of human critical and creative thought and how AI would be perceived in relation to that.

Within the context of philosophy, authorship is rooted in the humanist view that humanity is "the measure of all things" (Braidotti 2013, p. 2), and that the human capacity to think and create colonises the scope – the breadth and the depth – of authorship. Edmund Wilson (1936, p. 176) adds to this humanist view by stating that it is the author's spirit, their "Impulses and emotions" that ultimately fix their creative ownership over the embodied work. However, the poststructuralist, postmodernist and posthumanist views seek to challenge such notions of absolute human authorship. Of particular note is the work of Roland Barthes. In his 1967 essay 'The death of the author' (reproduced in *Image-Music-Text* in 1977), Barthes subverted author as an absolute originator of meaning – that it was not the author's history, biography and intentions that informed how their work would be received and understood. This idea opened the door for more readerly views, which have, in turn, contributed to the understanding that meaning making is collaborative, enacted by both human and nonhuman stakeholders.

Barthes' view on the matter of authorship is not regarded as having absolutely shaped twenty-first-century thinking about authorship. Rather, he posits that the collaborative potential of creative and critical engagement is worth noting as it questions who has power over the act of creating. Darren

Hick (2014, p. 151) agrees with this understanding by proposing the following definition of authorship as it is connected to power:

In short, authorship implies responsibility, and responsibility here (as in any arena) implies power. So, what gives an author this power? [...] Power comes, at least in part, from recognition by others of that power [...] We recognise authors as having power in the creation of their own works, and we do not recognise the power of artistic usurpers.

Hick is proposing here that authorship is an act of negotiation between those who intellectually engage with and create, and those who recognise the source of the creative output while discrediting imitators.

Hick's above definition connects well with the legalistic views of authorship as they pertain to copyright and the emerging concerns regarding AI and authorship. The Committee of Publication Ethics (COPE) is the first point of departure here. Alys Levene (2023) of COPE considers the importance of the question of authorship in relation to copyright when she posits that "definitions like authorship matter" and that "[it] matters who (and what) an author is, and whether they can answer for the ethics and trustworthiness of their work". Levene's argument here is based on her assertion that, unlike humans, AI systems cannot be held responsible for the work they represent. Levene (2023) states that "[a] bot – however well trained, and with whatever degree of clarity that is brought by distance from the messy, human experience of research, planning and writing – cannot understand what it writes". In this sense, Levene's view aligns with Hick's in proposing that AI is discredited as an author because it is an imitator rather than a creator. Certainly, legal precedent has disregarded AI as an author because it does not possess the qualities of author or owner in the human sense (McKendrick 2022). This aligns with the stance taken by the ICJME, who requires accountability and argues that AI tools "cannot be responsible for the accuracy, integrity, and originality of the work, and these responsibilities are required for authorship" (McKendrick 2023).

However, there are those who discredit this assumption, and much of the work in this regard is derived from the theories of Alan Turing. In 1950, Turing posited that a machine is capable of pretending to be human. He argued that if the machine could successfully pretend to be human to a knowledgeable observer, then such technology could certainly be considered intelligent. This test would satisfy most people but not all philosophers because of the nature of the intelligence imitation being enacted by the machine.

In 2012, Raquel Acosta (2012) scrutinised the potential authorship rights debates that may arise from works created by AI within the context of the United States legal system. What Acosta (2012) proposes in her article titled 'Artificial intelligence and authorship rights' has become a commonplace debate among academics and creators alike. She writes:

Advances in AI technologies are making machine authorship a reality, yet the legal standards that govern creative innovation do not take into account non-human innovation [...] Research into AI has led to machine learning techniques and autonomous computing systems where human authorship becomes attenuated or non-existent [...] Yet copyright law excludes works that result from purely mechanised or random processes, so some of the output of computer programs will necessarily straddle the boundary between what is copyrightable and what is not.

Acosta's observation anticipates the current dilemma and anticipates a sense of liminal chaos as boundaries are being dissolved and reconfigured in terms of what authorship is and will be. Humans no longer enjoy autonomy in terms of critical and creative thinking. AI systems are learning these skills as well. It is true that all things that are learnt by humans are initiated through imitation, and that from imitation, humans develop the confidence for critical and creative engagement. Perhaps this is also true for AI, and Turing (1950) was aware of this step in machine evolution as mirroring human evolution. This understanding of the learning capacity of AI opens up the potential for critical and creative collaboration with AI, countering the perceived threat it poses. Jack Stillinger (1991, p. 202)

expressed it eloquently when he commented that postmodern thinking has systematically undone the “romantic notion” of authorship. However, where postmodern and poststructuralist thought empowered the human reader, posthuman thought is now shaping a new relationship between human and nonhuman technology in co-creating. We, therefore, propose that AI technology, applied in design disciplines, should not be regarded as imitators or threats; AI is rather positioned as a mediator in the critical and creative process. It is already mediating our experience of the world and shaping our creative engagement with it.

### Critical and creative thinking competencies

When we explore direction in spatial terms, mapmakers, pilots, and navigators use the cardinal values for clear consistent directions. The four main points of the compass – north, south, east, and west – are known as the Cardinal Points. In South Africa, if you are navigating the national roads, such as the N1, taking the offramp for the N1 North or the N1 South will determine whether you arrive ultimately in Cape Town or Mesina. Disruption often has a disorientating effect in that some severe disruptions can shift our sense of location and orientation, much like the effects of an earthquake. Orientation is often unconscious, value-driven, and seldom interrogated. In considering how educators find direction in their theory and practice, we consider both the purposes of higher education and the location of the practice. How educators act and respond to changes will be informed by their experiences, practices, and orientation to what they aspire to achieve as an outcome. Immediate action after disruption is often informed by mental models based on past experience, whether or not those models and the related assumptions are still valid. Such modelling may be disrupted, a little like a compass being affected by a large magnet. And yet, cardinal directions remain in place despite the compass swinging wildly. That being said, we may need to pause and use other reference points or tools to navigate consistently through or past a disruption. We acknowledge that some disruptions may be limited temporally or geographically while others may need to be integrated into an updated GPS of practice.

In order to provide direction or orientation in times, two essential aspects are needed: Where are you trying to go and where you are now. These can be related to higher education in the purpose or outcomes of higher education and the current circumstances of educators. How you travel may be informed or constrained by axiology, budget, or the toolbox available.

## Design education and AI

### Human-centred learning and the Ubuntu philosophy

In much of the discourse around the emergence of drawing on generative AI, it emerges that there is not really a challenge to cardinal values in education, such as academic integrity, authentic and valid assessment, or student learning. Rather that academics are concerned that AI can be used in ways that undermine these values and the aspirations of causing learning. Therefore, we consider the ways in which AI can collaborate with educators to support student learning, rather than compete with educators or students to displace them from the learning processes.

Furthermore, various algorithms and AI have already been incorporated into tools that are used by authors and students to edit writing or images, to search for information and to process data. Many remain uninformed as to the extent to which they are already drawing on such tools. The release of generative AI has brought the debate of what can be automated or delegated to technology into the mainstream again.

### Criteria for authorship in student learning

Design education has long positioned students as content creators and designers during their education process. More than this, students are often required to collaboratively generate content

with others in group work contexts. This can be extended to collaborating with technology such as generative AI or differentiating against using generative AI as a tool, in the same way as software packages like Adobe.

The ICMJE recommends that authorship be based on the following four criteria:

- “Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
- Drafting the work or reviewing it critically for important intellectual content; AND
- Final approval of the version to be published; AND
- Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved” (ICMJE 2023).

Similarly, authorship requirements can be proposed for students. For the submission of assessments to be considered as authored by a student, that student would need to show a substantial contribution to the creative and critical conception or design of the work to meet assessment prompts. If students can show multiple drafts, editing and critical review of drafts for improvement to meet assessment criteria, this would support evidence of authorship. Submitting (or uploading) a final version to a learning platform can be construed as final approval of a “published version” and taking accountability for the authorship of such a submission. Assessors can require students to disclose whether they used AI or other tools in the production of submitted work and how they used it (similar to ICMJE (2023) recommendations).

Furthermore, existing principles of assessments can be applied when considering the criteria for authorship. Students are required to take accountability for what they submit for assessment against assessment instructions and outcomes. This supports the fourth criterion above.

Therefore, when using AI tools to source content for articles, courseware, or classes, faculty and students must adhere to the existing policy and practice of critically evaluating and verifying the sources of such content, regardless of whether they are original or fabricated by AI. This is analogous to the use of quotations from secondary articles. Allowing or requiring students to disclose the use of, and how they were used, of AI tools would support transparency in assessment.<sup>3</sup>

According to various assessment policies (for example, SAQA 2014), faculty must evaluate the student's work and abilities based on the assessment as learning, fair, valid, and authentic assessment principles, which measure the student's competence against the required outcomes. Therefore, submitting work done by others or AI as if it were their own violates both ethical and assessment principles. Where assessment instructions specifically preclude the use of AI tools, students who integrate generative AI output and submitted writing as if it was their own, therefore did not meet the relevant assessment requirements. This reiterates that when considering the outcomes being assessed, faculty should align assessments and assessment instructions to clearly delineate what is being assessed and what is being permitted.

Faculty, as discipline experts, remain positioned as SMEs who need to be aware of how AI developments are or may impact their disciplines and research areas and mediate such debates in their respective fields with students. Faculty also remain exemplars of acceptable practice in their respective fields. This would include remaining up-to-date with debates, emerging technology, and applications within their disciplines and in relation to their roles as design educators.

A copyright and Intellectual property concern remains. Authors like Aamir Ali (2023), Greenstreet (2023) or Ozcan, Sekhon, and Ozcan (2023) point out variations in copyright law in various countries and that some of the AI terms of use indicate that copyright may be retained by the company that developed the generative AI used. There are already cases testing these boundaries and cases where

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<sup>3</sup> Transparency as defined by SAQA (2014).

writers, songwriters and others are asserting their ownership of creative writing that is used without permission by some AI. Not all generative AI disclose or attribute the sources used in answering prompts, and additionally, some of the sources used may be incorrect attributions. For designers and content creators seeking to earn income from such content, these debates are critical to professional practice and thus for design education.

### Implications for practice

The challenge for educators is how do we create the curricula, material, and learning activities that interpolate students to actively engage in the processes of learning. Oppenheimer (2023) reminds us that “the best ways of thwarting cheating have never been focused on policing and enforcement; they have been about integrity training, creating a healthy campus culture, and reducing incentives to cheat”. Authors like Mollick and Mollick (2022) have published assessment examples and research on how students can collaborate with AI to complete tasks that require evaluation and reflection. Assessment redesign seems essential to maintaining authentic assessment.

Further critical aspects include emphasising the developmental nature of generative AI, the quality of the materials it draws on (from the internet) and what OpenAI’s CEO describes as “emergent (unanticipated) capabilities” (Brockman 2023). This has resulted in reports of wrong or fabricated information provided in response to prompts. Challenging students to assess responses from AI, similar to discussions relevant to fake news and evaluation of academic sources, can provide opportunities to develop critical thinking competencies.

Faculty remain responsible for clear communication of the appropriate use of AI tools and defining the acceptable use of such tools within the larger discourse of academic integrity. For example, faculty may need to point out that responses of various AI to questions or prompts are not peer-reviewed and cannot be considered an authoritative academic source (much like arguments used about Wikipedia). In addition, given the stated limits of AI by its developers and recent cases of error or fabrication in popular media, faculty can emphasise the need to critically evaluate outputs and the need for contextualisation. Faculty can retain a more defensible position with consistent values by linking these discussions to enduring assessment principles and cardinal values.

Faculty may struggle to recognise the outputs of AI if they are not experimenting with generative AI and participating in their communities of practice. These approaches require ongoing professional development, experimentation, and engagement within communities of practice on how these principles and values are practised in design education.

## Conclusion

As can be seen in the discussion above, there is a tension between creation and imitation that is inherent in design education. Design education requires that students become creators. The tension has yet to be resolved, both in the debate as to whether AI will enable greater creation or more imitation, or whether AI will simply imitate the creative. While designers often initiate their learning journey as imitators, a question remains as to whether AI’s trajectory will follow a similar path in truly transitioning from imitator to creator.

The impact of AI disruption may disorientate design educators, yet the cardinal values of teaching and learning remain sure and applicable and enable re-orientation in practice. Part of the disruption of AI is the magnification of existing problems that need to be addressed, such as academic integrity in assessment. The opportunity presented in disruption is to collaborate with technologies to advance and re-align practice to meet the needs of students, facilitate holistic student learning and ease the transition into new ways of teaching and learning.



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