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Taking Responsibility for Meaning and Mattering: An Agential Realist Approach to Generative AI and Literacy

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ABSTRACT

Questions and concerns about artificial intelligence (AI) technologies in education reached a fever pitch with the arrival of publicly accessible, user-facing generative AI systems, especially ChatGPT. Many of these issues will require regulation and collective action to address. But when it comes to generative AI and literacy, we argue that posthuman perspectives can help literacy scholars and practitioners reframe some concerns into questions that open new areas of inquiry. Agential realism in particular offers a useful perspective for exploring how generative AI matters in literacy practices, not as a unilaterally destructive force, but as a set of phenomena that intra-actively reconfigures literacy practices. As a sociocultural (and as we argue, sociotechnical) practice, literacy arises out of the entanglement of bodies, spaces, contexts, positions, histories, and technologies. Generative AI is another in a long line of technologies that reconfigures literacy practices. In this article, we briefly explain how generative AI systems work, focusing on text-based systems called Large Language Models (LLMs), and suggest ways that generative AI may reconfigure the sociocultural practice of literacy. We then offer three provocations to shift discussions about generative AI and literacy (1) from concerns about intentionality to questions of responsibility, (2) from concerns about authenticity to questions of mattering, and (3) from concerns about imitation to questions of multifarious communication. We conclude by encouraging literacy scholars and practitioners to draw inspiration from critical literacy efforts to discover what matters when it comes to generative AI and literacy.

INTERNATIONAL LITERACY ASSOCIATION

Introduction

Questions and concerns about artificial intelligence (AI) technologies in education reached a fever pitch with the arrival of publicly accessible, user-facing generative AI systems, especially ChatGPT (Peters et al., 2023). Generative AI refers to systems that generate text, image, sound, or other modes of content in response to prompts from users (Ruiz & Fusco, 2024). Trained on enormous corpora of data, these systems' responses can be indistinguishable from human creations. This fact of resemblance, in turn, has prompted panic about academic dishonesty (Surovell, 2023) and obituaries for essay-writing (Marche, 2022). Others, however, remind us that we have been here before, as calculators and laptops provoked similar disquiet (Surovell, 2023). This is not to downplay the serious concerns posed by generative AI and its rapid uptake, including bias and inaccuracy in responses, privacy and security questions surrounding data practices, the environmental costs of developing and maintaining such systems, and further concentration of market power in

Google and Microsoft, the current leaders in this space (Bender et al., 2021; Kak & West, 2023; Solaiman et al., 2023). These are significant concerns that require regulation and collective action to address. But when it comes to generative AI and literacy, we argue that posthuman perspectives, particularly agential realism, can help scholars and practitioners reframe some concerns and explore new areas of inquiry.

The rise of information and communication technologies including computers, mobile phones, the Internet and Web, and the plethora of social, educational, and creative practices that accompanied them, provoked similar questions about the future of literacy (Leu & Kinzer, 2000; New London Group, 1996). Current concerns about generative AI in education express fear that such systems may negate human agency (e.g., "ChatGPT is thinking for my students!") or contribute little value in education (e.g., "Students are not learning when they use ChatGPT!"). These concerns are reactions to techno-deterministic visions of AI single-handedly transforming every facet of social life. However, the sociocultural turn in literacy studies serves as a reminder that literacy is not only the functional skill of reading and writing but also a practice of shared meaning-making (Gee, 2015)—and indeed, *world*-making (Freire & Macedo, 1987). In other words, literacy is contingent—always a work-in-process. Non-representational approaches, or those that attend to the emergence of human and non-human forms rather than the ideas or concepts they represent, direct our focus to the material and affective dimensions of dynamic literacy practices, including bodies, desire, and the emergent potential of their enactments (Leander & Boldt, 2013). Thus, we encourage scholars and practitioners to channel fears about generative AI devaluing literacy into questions about how generative AI reconfigures enactments of literacy practices.

Posthuman perspectives offer ways of making sense of literacy practices that attend to entanglements of human, non-human, and more-than-human forms (Kuby & Rowsell, 2017). Their aim "is not to blur the boundaries between human and nonhuman, not to cross out all distinctions and differences…but rather to understand the materializing effects of particular ways of drawing boundaries between 'humans' and 'non-humans'" (Barad, 2011, pp. 123–124). One prominent posthuman approach, agential realism (Barad, 2007), understands reality not as a fixed set of objects and relations, but the dynamic enactment of material-discursive phenomena.

In the dominant understanding of reality, objects exist as distinct entities that interact with each other in temporary cause-and-effect relations. That is, reality consists of independent objects that briefly relate to one another. Agential realism contends that reality operates in the inverse. Phenomena, not objects, are the fundamental units of existence, where phenomena are ontologically inseparable relations of material-discursive actions. Such actions, constantly reconfiguring the fabric of spacetime, are agency. Agency is "not something that someone or something has…[but the] enactment of iterative changes to particular practices" (Barad, 2007, p. 178). As agency congeals and phenomena continuously materialize, matter arises. However, matter is not fixed; it is "not a thing but a doing" (Barad, 2007, p. 151). In conventional understandings of reality, matter preexists and *interacts* with other units of matter to produce relations. In agential realism, phenomena preexist and *intra-act*, or mutually constitute entangled agencies (Barad, 2007, p. 33), to produce matter.

The process of mattering is inseparable from the process of making meaning: "It is through specific agential intra-actions that the boundaries and properties of the components of phenomena become determinate and that particular concepts (that is, particular material articulations of the world) become meaningful" (Barad, 2007, p. 139). Here, literacy entails "learning how to intra-act responsibly within the world" (Barad, 2000, p. 237). Although agential realism operates in a different ontology compared to much literacy research, its focus on responsible action resonates with the aims of critical literacy to transform structures that perpetuate marginalization (Freire & Macedo, 1987). We believe that agential realism offers a useful perspective for exploring how generative AI matters in literacy practices, not as a unilaterally destructive force, but as a set of phenomena that intra-actively reconfigures literacy practices. Like any technology, generative AI systems can participate in literacy practices and help enact them in ways that make the world differently.

As a sociocultural (and we argue, sociotechnical) practice, literacy arises out of the entanglement of bodies, spaces, contexts, positions, histories, and technologies. Generative AI is another in a long line of technologies that reconfigures literacy practices. In the following section, we briefly explain how text-based generative AI systems work. We then review the sociocultural turn in literacy studies and explain how agential realism can help literacy scholars and practitioners examine how generative AI reconfigures literacy practices. To ground such inquiry, we offer three provocations that shift discussions about generative AI and literacy (1) from concerns about intentionality to questions of responsibility, (2) from concerns about authenticity to questions of mattering, and (3) from concerns about imitation to questions of multifarious communication. We focus on text-based generative AI systems and examples of essay writing, but we believe these provocations can help scholars and practitioners grapple with other generative AI modalities and literacy practices.[i] We conclude by noting several challenges of generative AI and encouraging scholars and practitioners to draw inspiration from critical literacy efforts as they discover what matters when it comes to generative AI and literacy.

How Text-Based Generative AI Systems Work

Text-oriented generative AI systems like OpenAI's Chat-GPT or Google's Gemini are based on large language models (LLMs). A language model is a computational system trained to predict the chance that a unit of language (e.g., character, word) could logically appear in a given text (Bender et al., 2021). These models are trained on data, typically corpora scraped from the Web, and make inferences based on patterns identified in the training data (Bender et al., 2021). Before training the model, developers must process the training data. This involves breaking its text into units, called tokens, which can be a word or part of a word, and converting each token into an integer (Microsoft Developer, 2023). Training is a multi-step process where the model computes relationships between various tokens. Each connection has a numerical weight, and each task the model performs involves different weights. The model computes the various weights to determine which combination best fits the task. As the model completes more tasks, it adjusts the weights. These weights, also known as parameters, are the variables that structure the model (Wolfram, 2023).

LLMs are called "large" because of the enormous size of their training data. For instance, OpenAI's GPT-3 model (created in 2020) contains 175 billion parameters and was trained on 300 billion tokens derived from 570 GB of training data (Bender et al., 2021; Microsoft Developer, 2023), while Meta's LLaMA model (created in 2023) contains 65 billion parameters and was trained on 1.4 trillion tokens derived from 4749 GB (4.75 TB) of training data (Microsoft Developer, 2023). Training for the LLaMA model required 2048 A100 GPU circuits, 21 days, and USD$5 million (Microsoft Developer, 2023). The sheer computational size of LLMs and the fact that their output now resembles coherent human language has provoked assertions that such systems understand language and engage in reasoning (Andersen, 2023; Harwell et al., 2022). Although it is unclear how exactly these systems produce what looks like human responses, some take the fact that they can as evidence that language may be a less complex phenomenon than we thought (Andersen, 2023; Wolfram, 2023).

Such assertions must be readily recognized as naive misunderstandings of language, learning, and expression. LLMs, on their own, are neither understanding nor reasoning (Bender et al., 2021; Bender & Koller, 2020; Kambhampati, 2023). They are what Bender et al. (2021) have famously called "stochastic parrots"—systems that manipulate variables to produce information that mimics language but do not understand meaning. As computer scientist Timnit Gebru, who coined the term with computational linguist Emily M. Bender, explained, "when you see a parrot repeating what humans are saying, you're not thinking that the parrot is understanding what we said, but [that] the parrot can repeat what we said back to us" (Zuckerman, 2023). For a word to mean something, it needs a linguistic form and a communicative intent (Bender & Koller, 2020). When we utter, read, or write the word formed by the letters l-i-t-e-r-a-c-y, we are trying to say something about the act of making meaning with language. But to an LLM, "literacy" is not a rich social practice. It is a set of integers numerically related to a plethora of other integers. Thus, if an LLM outputs the word "literacy," it is doing so not because it wishes to convey something about the way people make meaning with language, but because the system has computed that a particular arrangement of integers and weights is the most efficient way to solve a task.

Computer scientists and computational linguists like Gebru and Bender draw an important distinction between humans and LLMs. Even if the text they create looks similar, the processes by which they create it are different, and those differences matter. Scholars and practitioners can make valuable contributions by identifying those differences and articulating why they matter. But we encourage this work to proceed in a way that accounts for the role that technologies like LLMs play in meaning-making, rather than negating it. Agential realism provides a potent framework for this work by directing focus to the "specific material practices" that make meaning possible (Barad, 2007, p. 148). In agential realism, "meaning making is not a human-based practice, but rather a result of specific material reconfigurings of the world" (Barad, 2007, p. 465). The labor of collecting, labeling, and cleaning vast amounts of training data; the concentration of this labor in precarious and exploitative conditions in the Global South; the transformation of linguistic units into integers; the creation of digital interfaces to mediate end-user access; the consumption of colossal quantities of water and energy to operate data centers (Bender et al., 2021; Crawford, 2024; Kak & West, 2023; Perrigo, 2023; Solaiman et al., 2023)— all of these processes that contribute to the development of LLMs affect how and what kind of meaning can be made from their output as well as what world is called into being. An agential realist approach contests fears about the involvement of generative AI in learning that rely on a presumption of literacy as a stable target that human agencies alone enact. This agential realist approach resonates with the sociocultural turn in literacy, which we now discuss.

Literacy in a World with Generative AI

Frameworks like critical literacy and new literacy studies understand literacy as more than the encoding and decoding of written text, recognizing the diverse array of communication channels and media through which people construct and express meaning as well as the situated

nature of meaning-making (Gee, 2015; New London Group, 1996). Literacy is "something people [do] in the world and in society, not just inside their heads" (Gee, 2015, p. 35); it involves "getting and giving meanings" within different social, cultural, political, historical, and institutional contexts (Gee, 2015, p. 37). Scholars and practitioners have advocated for the understanding of literacy as a technique of empowerment through which to advance social equity and justice (Freire & Macedo, 1987; Mirra & Garcia, 2021; Naqvi, 2015). Yet, literacy should not be understood as a panacea for addressing social inequities. Indeed, it has also served a "domesticating function," assimilating learners into dominant modes of being, doing, thinking, and knowing (Collins & Blot, 2003; James, 1990; Naqvi, 2015). Literacy does not automatically liberate marginalized people from unjust systems of power that disenfranchise them and constrain opportunities (Graff, 1991; James, 1990). Rather, literacy can help learners and educators become "active participants in social change" (New London Group, 1996, p. 64).

Posthuman perspectives further urge an unmooring of literacy studies from questions of what literacy means or what knowledges or capacities it entails to treat it as something that is actively produced through intra-action of human, non-human, and more-than-human forms (Kuby & Rowsell, 2017). This shift encourages the destabilization of literacy in order to see how different entanglements of learners, educators, technologies, languages, and physical environments dynamically configure literacy as a practice situated in time and space. From this perspective, the introduction of generative AI does not require a radical reimagining of literacy, as some might suggest. Rather, it invites us to ask questions about how generative AI systems are reconfiguring literacy practices. For instance, what material and discursive processes are at work in prompting generative AI systems, in evaluating the output of these systems, and in integrating their output into assignments, creative work, and other forms of expression. What boundaries are phenomena involving generative AI systems crossing, erecting, and/or dissolving? How does the material from such systems come to matter? We encourage scholars and practitioners to explore such questions in the context of the specific literacy practices they work with. To ground this work, we offer three ideas of ways to move from concerns about generative AI to questions about its role in literacy, encouraging a balance of curiosity and criticality.

From Concerns about Intentionality to Questions about Responsibility

One concern is that the use of generative AI systems in education reduces introspective and independent thought (Akgun & Greenhow, 2022), rendering people less willing to exert their own decision-making capacities. If a student writes an essay for a course assignment by typing a few prompts into ChatGPT and paraphrasing the output, are they fully engaging in the learning process or taking a backseat?

When students use generative AI tools, they may be seen as sacrificing, to varying degrees, their independence, right to privacy and power of choice (Anderson et al., 2018). However, literacy theory has recognized that agency in literacy acts can be distributed across human and non-human actors (McEneaney, 2006). Agential realism carries this idea further and approaches agency itself as "the possibilities for the iterative reconfiguring of the materiality of human, nonhuman, cyborgian, and other such forms" (Barad, 2007, p. 178). The concern that students who use LLMs may not be thinking deeply belies the conventional belief that thinking is an intentional act performed by an agentive subject. Agential realism would have us examine the myriad material-discursive processes that constitute the broader practice we call essay writing. For instance, reading an essay prompt alone involves visual stimuli in the form of words, embedded in an interface like a learning management system and displayed on a laptop, tablet, phone, or projector screen, being perceived by eyes, transmitted through nerves, received by neurons, and processed through a whole host of physiological processes that are themselves influenced by psycho-social processes (e.g., the student's mood, their attitude toward the class) and broader cultural conditions (e.g., campus environment, family situation, prior life experiences). In this context, focusing on intentionality oversimplifies the reality of the student's experience.

What material-discursive processes constitute "using ChatGPT" in writing the essay? Many of the same processes involved in reading the essay prompt, plus the acts of conceiving ideas and words, crafting them into prompts, typing or speaking the prompts to the system, interpreting the system's output, integrating these ideas with other information the student has or knows about the subject, aligning the information with the essay prompt, etc., all iteratively unfolding in what the student may experience as a fluid process. In addition, we must not forget that all of the practices involved in creating and sustaining generative AI systems mentioned at the end of the section on "How Text-based Generative AI Systems Work" also play a role in this process of essay-writing, though they likely do not enter the student's conscious awareness. It is out of this dynamic entanglement of practices that something we recognize as literacy emerges. With this understanding of literacy, concerns about intentionality can be reconfigured into questions about responsibility, or, as Barad frames it, response-ability (Barad, 2007; Kuby & Rowsell, 2017), signifying "the possibilities of mutual response" (Dolphijn & van der Tuin, 2012, p. 55).

Educators are likely familiar with the process of responsibility responding to changing conditions. Consider how an educator might respond to a struggling student. Trauma-informed pedagogy suggests that arts-based assignments can help students enduring chronic stress develop literacy (Cramer, 2018). This response is grounded in an understanding that systemic oppression materially affects the body in ways that diminish health and wellbeing (Geronimus, 2023) and reduce academic achievement (Crouch et al., 2019). While educators may not be able to change the difficult conditions in a student's life, by recognizing and responding to the way trauma affects that student, they expand the boundaries of literacy to include sociocultural forces.

Similarly, the entanglement of generative AI systems in education presents an opportunity to expand the boundaries of literacy practices to include sociotechnical forces (Tacheva & Ramasubramanian, 2023). Educators can work with students to explore questions like: What does it mean to create ideas with a system that relies on people going through the trauma of filtering out graphic and violent content (Perrigo, 2023)? How would our practices change if each time we submitted a prompt, we could see the water that cools the system's servers leach out of an Iowa community (Crawford, 2024)? These practices are not "ours" alone, yet we are responsible, in part, for what they create.

From Concerns about Authenticity to Questions about Mattering

The fact that generative AI systems can produce human-like output has raised concerns that it may become harder to tell whether various forms of communication, from class assignments to academic papers, are authentic reflections of a person's thoughts (Kiser, 2023; Májovský et al., 2023). Concerns about authenticity matter because, from a societal perspective, authenticity serves as a social glue that helps reinforce trust. For instance, when a student submits an essay, a teacher trusts that the work reflects the student's own effort as well as their own understanding of the topic at hand. One common question is that if a student writes an essay by simply paraphrasing ChatGPT output, does the essay really represent *their* understanding?

But if we understand meaning-making as a constellation of material-discursive processes then understanding is *already* a product of more than just the writer. As Barad (2007) declares in the opening lines of her book on agential realism, "Matter and meaning are not separate elements. They are inextricably fused together" (p. 3). We typically regard the process of writing an essay as an act of representing ideas that pre-exist in the world, perhaps in a novel or insightful manner. Agential realism eschews representationalism, instead regarding the world as "an open process of mattering through which mattering itself acquires meaning and form through the realization of differential agential possibilities" (Barad, 2007, p. 141). In other words, all of the material-discursive processes that go into writing an essay create meaning through their intra-actions, with agency being the force that propels this performance. Knowing is a matter of responding to what matters (Barad, 2007, p. 149). Engaging in "responsible actions…requires that we come to learn how our practices come to matter" (Barad, 2000, p. 237).

One concern is that if students overly rely on generative AI systems, they will end up stringing together platitudes, parroting bland, quotidian ideas at the expense of developing novel or unique interpretations (Akgun & Greenhow, 2022), not fully engaging with what matters. This concern is well founded. As noted earlier, generative AI systems require enormous amounts of training data, but even these massive data sets do not capture the totality of expression (nor could they). Training data only encompasses information that is digital or has been digitized and primarily includes information in dominant languages (e.g., English), meaning that information recorded in analog formats or expressions in non-dominant languages (e.g., Dhivehi, Sudanese Arabic) are unavailable or overlooked (Bender et al., 2021). One training data set, containing content from 15 million sites, is "dominated by websites from industries including journalism, entertainment, software development, medicine and content creation" (Schaul et al., 2023). A system trained on this data may generate output that overly reflects these genres at the expense of other forms of expression.

In the spirit of exploring how generative AI comes to matter in literacy practices, we encourage educators to help students see how certain ideas and forms of expression have "sedimented out of the process of making the world intelligible through certain practices and not others" (Barad, 2000, p. 236). Educators and students can explore how the practices that build generative AI systems produce biased and inaccurate output and how to probe, critique, and question such output. They can study grassroots efforts to create AI systems for languages like Amharic, Tigrinya, Catalan, Indonesian, Jamaican Patois, and Māori (Schacht, 2023), which present alternatives to the domineering practices of technology platforms. Educators also help students learn how to use generative AI responsibly, for instance, to gather ideas or brainstorm different ways of phrasing a thought (Kambhampati, 2023; Microsoft Developer, 2023), rather than to locate definitive answers. This framing of responsibility draws focus to the world-making practices that become possible (or not) by engaging with generative AI. The way we enact literacy makes the world in both meaning and matter.

From Concerns about Imitation to Questions about Multifarious Communication

Although generative AI's capacity to parrot speech patterns raises concerns, this capacity also presents opportunities for learners. Language embeds deep cultural knowledge not easily learned. Generative AI has the potential to help translate meaning across languages, dialects, genres, and stylistic conventions within diverse social worlds. As a translator, generative AI could make multifarious communication easier for learners, such that they could experiment with the substance of their message as well as its delivery. In doing so, learners may convey and interpret meaning across "a multiplicity of discourses" (New London Group, 1996, p. 61) to better connect with those whose language (linguistic, cultural, and social) they do not share. Although a student may not feel confident in her ability to compose a five-part persuasive essay, she may have a persuasive argument with well-founded points to support it. Experimenting with generative AI could help open new pathways for communication and interaction. Rather than seeing generative AI as approximating or displacing what we take to be human capacities, agential realism invites us to question what are "human capacities" and reposition such systems as companions supporting the exploration of different facets of literacy through relationality. This reimagining of literacy with generative AI could render it a technology of connection, with critical emphasis on empathy and inclusion.

Importantly, this shift must entail "taking into account of what materializes and of what is excluded from materializing" (Barad, 2011, p. 149) in the enactment of expression. As noted earlier, LLM training data, while massive, primarily encompasses professional genres and dominant languages. While more comprehensive training data could expand the repertoire of generative AI applications, no training dataset will encompass the complete range of expression. The goal is not to facilitate universal translation, but rather to explore how the enfolding of generative AI into literacy practices can differentially enact "boundaries, properties, and meanings" (Barad, 2007, p. 392). This "differentiating is not about othering or separating but on the contrary about making connections and commitments" (Barad, 2007, p. 392). Already, scholars are using relational approaches to explore how LLMs reconfigure practices of creativity and subjectivity (Celis Bueno et al., 2024; Yan, 2024). Literacy practices are ripe for analysis through a relational approach, especially considering the chatbot-based design of interfaces like ChatGPT that promote inquiry as a conversational act. Educators can take advantage of the fact that generative AI systems constantly generate different output, even in response to the same prompt, to encourage playfulness and curiosity. For instance, students could prompt the system to present the same idea in different ways, varying the persona (e.g., "state this as if you were the president"), genre ("explain this as if it were a murder mystery"), or the mode (e.g., "turn this idea into a poem"). Each intra-action among learner-prompt-system enacts the world a bit differently, and collectively, these differences convey something about the shared process of performing meaning. Exploring such differences can help us see how meaning comes to matter.

Conclusion: Situating Generative AI in the Practice of Literacy

To understand the emergence of generative AI tools in literacy practices, we must move beyond conventional views of literacy based on historical or path-dependent projected visions. We have suggested a view of literacy as a dynamically enacted practice that materializes meaning, which shifts even as it comes to be. This view precludes an understanding of literacy as performed exclusively by an agentic human subject who acts with individuating intention.

While seeing generative AI systems this way may help scholars and practitioners develop educational experiences that orient learners toward a sense of "response-ability" (Barad, 2007) in literacy practices, several challenges emphasize the need for heightened critical reflexivity. These include:

- *Bias*: Generative AI systems are trained largely on text extracted from the Web, which is known to reflect negative stereotypes toward various groups of people based on gender, race, nationality, physical ability, religion, and other identity categories. While developers increasingly recognize this concern, their efforts to address it often rely on automated techniques that cannot grasp the nuance and context embedded in language, and are thus limited in the extent to which they can mitigate harm (Akgun & Greenhow, 2022; Bender et al., 2021; Kak & West, 2023).

- *Privacy*: Generative AI systems collect and store the prompts users provide and the output systems generate, among other types of data. It is unclear how companies that own these systems manage and use this data (Akgun & Greenhow, 2022; Kak & West, 2023).

- *Inequity*: Since generative AI systems are largely trained on text from the Web, their output over-represents ideas from the white, wealthy, male

perspectives that dominate the Web. This means that generative AI systems cannot produce output that reflects the beliefs and experiences of the billions of people in the world who do not regularly contribute text online, let alone in the variety of languages people speak. Furthermore, adoption of such systems is not evenly distributed, which could further exacerbate the digital divide (Akgun & Greenhow, 2022; Bender et al., 2021; Reiss, 2021).

These challenges serve as a reminder that generative AI systems fundamentally embed dominant modes of expression. Inferring meaning from generative AI output without understanding the material-discursive processes that constitute not only the output of such systems but also how this output is taken up, runs the risk of perpetuating literacy as a force for domestication, rather than liberation. Literacy in a world with generative AI must adopt an even greater emphasis on "encourag[ing] critical questioning" (Naqvi, 2015, p. 57) about how text produced with generative AI systems reinforces the existing social order. Thus, concerns about the use of generative AI as constraining intentionality, diminishing authenticity, or bolstering imitation can be reframed into questions about how to connect, how these connections come to matter, and how to collectively take responsibility for the meaning that emerges.

Actualizing this critically oriented approach to meaning-making requires remembering that literacy is not just what goes on in people's minds, but the interplay between bodies, spaces, contexts, positions, histories, and technologies, which are themselves not fixed entities but dynamically unfolding practices. Knowing is a practice that arises out of the intra-action of material-discursive processes (Barad, 2007, p. 149), including the neuronal processing of sensory information in what we conventionally consider the human mind as well as the computational processing of quantitative data derived from textual corpora in what we call LLMs. More than inert tools, technologies including generative AI systems are "forms of life" (Winner, 1989, p. 3) and arrangements of authority and power. Too often, education embraces technologies as means to solve fundamentally social problems (Williamson, 2024). Thus, we encourage scholars and practitioners to engage with developers and critical social scientists to design literacy efforts involving generative AI that are grounded in a thorough understanding of the system's technical capabilities, aligned with the principles of sound pedagogy, and informed by knowledge of the politics of technology (Williamson, 2024).

While it may be tempting to turn away from generative AI systems out of fear that using them may undermine the work of learning, doing so would ignore the "always already entangled" nature of human, non-human, and more-than-human forms in the processes of thinking and learning (Kuby & Rowsell, 2017). Instead, we encourage scholars and practitioners to see generative AI as part of one of literacy's aims–helping learners recognize how to use technology in the process of meaning-making (Leu & Kinzer, 2000), while always keeping in mind the importance of developing critical literacy skills that facilitate responsible intra-actions with the world.

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Conflict of Interest Statement

We have no conflict of interest to disclose.

ENDNOTE

i For cultural critiques on the use of generative AI in visual art, see Jiang et al. (2023) and Wong (2023). We thank Kristen Reynolds for pointing us to this work.

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