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The Future is Connection:

Collaboration, Creativity and Compassion in a Digital Society

Beyond prompting: An epistemic agency framework for generative AI literacy

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Generative artificial intelligence (GenAI) has fundamentally altered how learners access, construct, and engage with knowledge. Existing discussions of GenAI literacy have largely emphasised operational competencies, such as prompt engineering, understanding AI capabilities, and ethical use. While these competencies remain important, they do not fully address the epistemic challenges arising from AI-mediated knowledge production. This paper proposes reframing GenAI literacy through the lens of epistemic agency; that is, learners' capacity to critically evaluate, regulate, justify, and take responsibility for knowledge generated in collaboration with intelligent systems. Rather than viewing GenAI literacy as a collection of technical skills, this conceptual paper argues that its primary educational purpose is to cultivate learners who can exercise informed judgement in increasingly AI-mediated learning environments. Building on existing AI literacy scholarship and theories of epistemic agency, the paper introduces a conceptual framework comprising four interrelated dimensions: epistemic evaluation, epistemic regulation, epistemic responsibility, and epistemic autonomy. The framework provides a theoretically grounded perspective for understanding how GenAI literacy can move beyond operational competence towards fostering independent, reflective, and responsible knowledge construction.

Keywords: epistemic agency, GenAI, AI literacy

Introduction

Generative artificial intelligence (GenAI) is rapidly reshaping educational practice by enabling learners to generate essays, explanations, computer code, images, and other forms of knowledge with unprecedented ease. Consequently, research on GenAI literacy has expanded rapidly, with existing frameworks primarily emphasising operational competence, including understanding AI capabilities, prompt engineering, ethical awareness, and responsible use (Long & Magerko, 2020; Rapanta et al., 2025). These perspectives provide an important foundation for preparing learners to interact effectively with AI technologies. However, they only partially address the educational implications of GenAI. Unlike previous digital technologies that primarily facilitated access to information, GenAI actively participates in knowledge production. Learners increasingly engage with AI-generated explanations, arguments, and solutions that are linguistically fluent yet not necessarily accurate or epistemically justified. Consequently, the educational challenge extends beyond learning how to use AI effectively towards determining how learners should evaluate, regulate, and assume responsibility for AI-mediated knowledge. This shift represents an epistemic rather than merely technological transformation. This paper proposes an Epistemic Agency Framework for generative AI literacy. It argues that the primary educational purpose of GenAI literacy is not simply to develop operational competence but to cultivate learners' capacity to critically evaluate, regulate, and take responsibility for knowledge produced in collaboration with intelligent systems.

The need to move beyond operational competence

Current AI literacy frameworks have significantly advanced educational thinking by identifying the knowledge, skills, and ethical awareness required for interacting with AI technologies. These frameworks typically include understanding how AI systems operate, recognising their limitations, identifying algorithmic bias, and engaging with AI responsibly (Long & Magerko, 2020). More recent work has further emphasised the contextual and sociocultural nature of GenAI literacy, arguing that effective engagement with AI depends upon disciplinary, institutional, and cultural contexts (Rapanta et al., 2025). Nevertheless, most existing frameworks remain centred on AI as a technology to be understood and used. Their primary concern is whether learners possess

sufficient competence to operate AI systems appropriately. This perspective is increasingly insufficient because GenAI changes the epistemic conditions of learning itself (UNESCO, 2023). Rather than simply retrieving information, GenAI generates new representations of knowledge through probabilistic prediction. Learners therefore engage not only with information but with AI-mediated interpretations, syntheses, and explanations that require continual evaluation. The educational challenge consequently shifts from operational competence towards epistemic competence. Success in AI-enhanced learning is no longer determined by whether students can generate effective prompts, but whether they can critically determine when AI-generated knowledge is credible, when it requires verification, and when independent reasoning should prevail.

An epistemic agency framework for generative AI literacy

This paper proposes epistemic agency as the organising construct for GenAI literacy. Epistemic agency refers to learners' capacity to intentionally evaluate, regulate, justify, and assume responsibility for knowledge claims. Within AI-mediated learning environments, epistemic agency enables learners to remain active participants in knowledge construction rather than passive recipients of algorithmically generated information. Operational AI skills become supporting capabilities rather than educational endpoints. The proposed framework comprises four interrelated dimensions. Epistemic evaluation concerns learners' ability to critically interrogate AI-generated outputs. This includes recognising hallucinations, verifying evidence, identifying omissions, and evaluating the credibility of AI-generated claims against disciplinary knowledge. Rather than accepting AI responses because they appear fluent or authoritative, learners exercise informed judgement about their validity. Epistemic regulation refers to learners' capacity to monitor and regulate the role of AI throughout the learning process. Learners decide when AI should support thinking, when independent reasoning is preferable, and how AI-generated content should be refined or challenged. This dimension highlights metacognitive control over AI use rather than technological dependence. Epistemic responsibility emphasises ethical and transparent engagement with AI-generated knowledge. Responsible learners acknowledge AI appropriately, justify how AI contributed to their work, and remain accountable for the final knowledge claims they present. Academic integrity is therefore understood not simply as avoiding inappropriate AI use but as demonstrating responsible epistemic judgement. Epistemic autonomy represents the ultimate educational goal. Learners retain ownership of their understanding despite collaborating with increasingly capable intelligent systems. Rather than outsourcing thinking to AI, they use AI to extend their reasoning while maintaining independent intellectual judgement. Together, these four dimensions position GenAI literacy as an educational framework for cultivating human judgement rather than merely improving technological proficiency.

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