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The Future is Connection:

Collaboration, Creativity and Compassion in a Digital Society

What makes AI educational? A sociocultural framework for transforming AI from artefact to mediating tool

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Generative artificial intelligence (AI) is increasingly embedded in higher education, yet much of its use positions AI as a private productivity tool for generating answers, feedback or text. This paper argues that AI is not educational simply because it produces outputs. From a sociocultural perspective, its educational significance emerges when pedagogical design transforms it from an artefact into a mediating tool for participation in disciplinary learning. The paper introduces the AI Mediated Participation Framework, grounded in mediated learning, appropriation and participation. It proposes three design principles: preserving learner ownership, scaffolding thinking through dialogue, and developing AI literacy through disciplinary practice. These principles operate through questioning, dialogue, reflection, critical evaluation and decision making to support learner agency, evaluative judgement, responsible AI use, critical thinking and knowledge construction. The framework is illustrated through AI learning activities in undergraduate and postgraduate educational research courses, where educator modelling, peer discussion and disciplinary expectations repositioned AI from a private feedback service to a mediating tool for methodological reasoning and researcher judgement. The framework shifts attention from what AI can do to how pedagogical design determines what AI becomes educationally.

Keywords: artificial intelligence in higher education, sociocultural learning, mediated learning, learner agency, AI literacy, conceptual paper

Introduction

Generative artificial intelligence (GenAI) has rapidly become part of the everyday learning environment of higher education. Students increasingly use AI to support learning, while educators are reconsidering assessment, academic integrity and the capabilities graduates need in an AI rich world (Chan & Hu, 2023; UNESCO, 2023). These developments make AI a pedagogical issue, not only a technical or policy issue. The key question is therefore not simply whether students will use AI, but how AI comes to function educationally within learning.

Recent work on educational AI has increasingly examined adaptive learning, AI literacy, self-regulated learning, feedback, assessment and pedagogical design (Ates, 2026; Darejeh et al., 2025; Hackl et al., 2026; Qian, 2025; Sargazi Moghadam et al., 2024; Xia et al., 2026), alongside growing attention to conversational learning, educator decision making and pedagogically informed GenAI integration (Bakharia & Corrin, 2025; McGuirk, 2025). Across this literature, the primary focus tends to be on what AI can support, how it should be integrated, or what capabilities learners and educators need. Comparatively less conceptual attention has been given to how the educational role of AI itself is constituted through pedagogical and social relations within learning activity. The AI Mediated Participation Framework addresses this gap by explaining how pedagogical design shapes the educational role AI comes to assume within disciplinary learning.

More broadly, research on digital learning has shown that increasing learner interaction with technology is not inherently beneficial; its educational effects depend on the nature of the interaction and how it is designed (Darejeh et al., 2022). This reinforces the need to consider not simply whether learners interact with AI, but how that interaction is pedagogically organised. From a sociocultural perspective, the educational significance of AI lies not in the technology itself but in how it mediates learning through relationships among learners, educators, disciplinary practices and assessment (Markauskaite et al., 2022). AI is therefore not educational simply because it generates outputs. Initially, it is an artefact. It becomes educational when pedagogical design transforms it into a mediating tool that supports participation in disciplinary learning.

This paper introduces the AI Mediated Participation Framework, a socioculturally informed conceptual framework for designing AI supported learning in higher education. The framework explains how pedagogical design transforms AI from an artefact into a mediating tool by positioning it as one resource within a broader activity system that supports participation, dialogue, evaluative judgement and learner ownership. Developed through the design and refinement of AI

supported learning activities in undergraduate and postgraduate educational research courses, the framework offers a pedagogical lens that can inform AI supported learning across higher education.

AI, mediation and participation

The sociocultural view of learning understands learning not simply as the internal acquisition of information but as a socially mediated process shaped by language, interaction, and participation in cultural practices (Vygotsky, 1978; Wertsch, 1991). Within this tradition, artefacts embody accumulated cultural knowledge and ways of thinking, while tools are artefacts that have been appropriated for purposeful action (Cole, 1996). Appropriation is therefore an educational process through which learners come to use an artefact in ways that are meaningful within a particular disciplinary community. This occurs through participation in shared activity, where learners develop increasingly informed ways of thinking and acting alongside others (Mashayekh, 2022; Rogoff, 1995).

GenAI can be understood as such an artefact. It carries traces of accumulated human knowledge and language, yet access to AI alone does not make it educationally meaningful. AI becomes educationally meaningful only when learners are supported to appropriate it through participation in disciplinary practice (Cole, 1996; Rogoff, 1995). Its educational significance therefore lies not in its capacity to generate fluent responses, but in how pedagogical design positions learners to interpret, question and evaluate those responses in relation to disciplinary standards. This process of mediation is distributed across the wider activity system rather than located within AI alone. Educators mediate learning by modelling disciplinary reasoning and guiding interpretation. Peers mediate learning by questioning, comparing and refining ideas through dialogue. Assessment criteria and disciplinary standards mediate judgements about quality. Within this wider activity system, AI becomes one mediating tool among many rather than the central actor. Its educational value depends on how it is integrated into social activity, where learners collectively interpret, critique and act on its outputs rather than interacting with AI in isolation, consistent with learner centred views of technology rich learning contexts (Luckin, 2010). When AI is used primarily as a private source of answers, it can narrow learning to output production. When AI generated responses become shared objects for discussion, critique and decision making, learners compare interpretations, negotiate meaning and exercise judgement. In this way, pedagogical design transforms AI from an artefact that generates responses into a mediating tool for participation in disciplinary thinking.

This distinction matters for AI literacy. AI literacy is often described as the capacity to understand, use, evaluate and critically respond to AI systems (Long & Magerko, 2020). However, higher education also needs students to develop judgement about when AI is useful, when it is misleading and how its outputs relate to disciplinary standards and purposes. Such capabilities are close to evaluative judgement, understood as students' capability to make informed decisions about the quality of their own and others' work (Tai et al., 2018). For this reason, AI literacy should not sit outside disciplinary learning. It should be developed through participation in activities where students practise questioning, critique and decision making with peers and educators.

AI Mediated Participation Framework

The AI Mediated Participation Framework (see Figure 1) addresses a practical design problem: how can educators integrate AI in ways that support agency and participation rather than dependency and passive consumption? The purpose of the framework is therefore not simply to guide AI use but to explain how pedagogical design changes AI's educational role. The framework therefore treats pedagogical design as the mechanism through which AI is transformed from an artefact that generates outputs into a mediating tool for participation in disciplinary learning. Its focus is not AI itself, but the learning relations and intellectual actions organised around its use. The framework is grounded in a sociocultural view of learning, which understands learning as emerging through participation in socially organised activity rather than through individual cognition alone. Accordingly, the design principles, mediating processes and intended outcomes should be understood as situated within this broader activity system, where AI, educators, peers, disciplinary knowledge and assessment all shape opportunities for learning.

Three design principles underpin the framework. The first is preserving learner ownership. Students remain responsible for interpreting the task, evaluating evidence, making decisions and constructing the final response. AI may offer possibilities, but it does not decide what counts as a strong argument, an appropriate method or an ethical choice. The second principle is scaffolding thinking through dialogue. AI prompts and outputs generate questions, alternatives and tensions that can be explored in class discussion, peer dialogue and individual reflection. The third principle is developing

AI literacy through disciplinary practice. Students learn about AI limitations, bias, hallucination, privacy and appropriate use while working with authentic disciplinary problems rather than through isolated technical instruction.

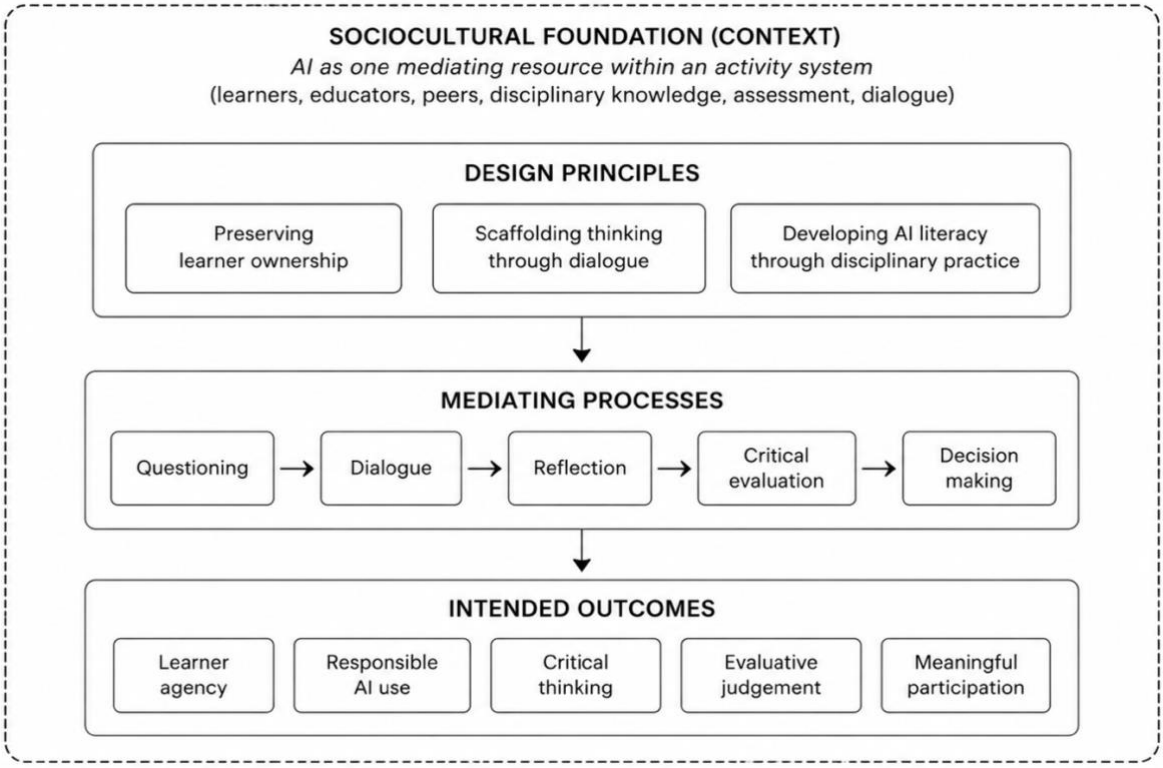


Figure 1. AI Mediated Participation Framework

These principles support five mediating processes of questioning, dialogue, reflection, critical evaluation and decision making. Questioning encourages students to surface assumptions and explore alternatives. Dialogue invites comparison between AI suggestions, peer interpretations, educator guidance and disciplinary expectations. Reflection asks students to examine how their thinking has changed. Critical evaluation requires students to scrutinise evidence, relevance and quality. Decision making keeps students accountable for what they accept, adapt or reject.

The intended outcomes are learner agency, responsible AI use, critical thinking, evaluative judgement and meaningful participation in knowledge construction. Importantly, these outcomes do not arise from AI alone. They depend on pedagogical design. This is consistent with feedback research, which argues that feedback becomes useful only when learners actively interpret information and use it to improve future work (Boud & Molloy, 2013). In the same way, AI generated feedback has educational value only when students learn how to judge, contest and act on it.

Applying the framework in educational research courses

The framework was developed through the design and refinement of AI supported learning activities implemented within undergraduate and postgraduate educational research courses. Educational research is used here as an illustrative context in which the framework was developed and operationalised. The purpose of this section is not to evaluate the learning activities themselves but to demonstrate how the framework can inform pedagogical design. This context is particularly significant because students are learning not only research methods but also how to think and act as beginning researchers. Developing researcher judgement requires students to ask worthwhile questions, justify methodological choices, interpret evidence, evaluate feedback and make defensible decisions. If AI is used primarily to produce answers or polished text, these practices can become obscured. Designed as a mediating tool within learning, however, AI can make them more visible, discussable and contestable.

These courses required students to move from broad interests to focused research problems, review literature, justify methodological choices and prepare research proposals. The framework was operationalised through a sequence of educator modelling, guided AI use and collaborative discussion. The educator first modelled AI use with sample research

writing. Students examined the prompt, the AI generated response and the relationship between that response and the assessment criteria. Whole class discussion focused on what the AI appeared to understand, what it missed, what assumptions shaped its advice and which suggestions would need to be checked against disciplinary standards and assessment expectations. This modelling was important because students cannot be expected to use AI critically simply because they have access to it. Rather, it supported students to appropriate AI as a disciplinary tool by learning how to interpret, question and evaluate its outputs against the norms of educational research. Through this shared analysis, AI ceased to function merely as a source of generated feedback and became a mediating tool through which dialogue about research quality, methodological reasoning and scholarly judgement became possible.

Students then used the same structured prompts to seek feedback on their own research ideas or draft sections before bringing selected AI responses to small group discussion. Rather than accepting AI suggestions automatically, they explained which suggestions they considered useful, inaccurate, generic or misaligned with their intentions. Peers asked questions, compared responses and discussed alternative interpretations. Throughout these discussions, the educator drew attention to research design principles, methodological coherence and the distinction between surface improvement and stronger conceptual development.

In these activities, AI did not provide the final judgement. Its value was that it created a visible and contestable text around which students could practise researcher judgement. Students had to decide whether a research question was sufficiently focused, whether a proposed method aligned with the research aim, whether a literature gap was warranted, and whether feedback should be accepted, adapted or rejected. In sociocultural terms, AI had been appropriated as a mediating tool. Rather than functioning as a private answer generator, it became a shared object through which students negotiated meaning, exercised researcher judgement and participated in the practices of educational research.

Conclusion

The AI Mediated Participation Framework makes a conceptual and theoretical contribution by shifting attention from the capabilities of AI to the pedagogical and social relations through which AI acquires educational meaning. Rather than treating educational value as a property of the technology itself, or of an individual learner's interaction with it, the framework positions AI within a wider activity system in which educators, peers, disciplinary knowledge, assessment and dialogue mediate learning. In doing so, it brings together sociocultural concepts of mediation, appropriation and participation to explain how AI can be transformed from an artefact that generates outputs into a mediating tool through which learners participate in disciplinary thinking and knowledge construction.

The framework also makes a design contribution by translating this theoretical account into principles and processes that educators can deliberately organise. Preserving learner ownership, scaffolding thinking through dialogue and developing AI literacy through disciplinary practice provide the conditions for questioning, reflection, critical evaluation and decision making. Accordingly, educational AI design should focus not only on what AI enables learners to produce, but on the forms of participation, judgement and agency that pedagogical design makes possible around its use.

The AI Mediated Participation Framework has three implications for AI supported learning design. First, AI should be embedded within shared learning activities rather than individual interactions so that interpretation, dialogue and judgement become visible. Second, educators should model critical engagement before expecting independent AI use by demonstrating how to evaluate accuracy, recognise generic advice, identify missing context and judge whether AI supports disciplinary purposes, consistent with human centred approaches to AI (Markauskaite et al., 2022; UNESCO, 2023). Third, learning activities should assess students' decisions and rationales, not only their final products, shifting attention from detection and compliance towards judgement, transparency and learning.

GenAI is often discussed in terms of faster answers, feedback and efficiency. This paper argues that its educational value depends less on these capabilities than on pedagogical design. The AI Mediated Participation Framework positions AI as a mediating tool within an activity system, preserving learner ownership, scaffolding thinking through dialogue and developing AI literacy through disciplinary practice. The framework shows that AI is not educational because it generates outputs. Its educational significance emerges when pedagogical design transforms it from an artefact into a mediating tool that supports participation, dialogue and disciplinary learning.

References

Ates, H. (2026). Human-centered GenAI feedback design in higher education: A multisite experiment on direct, reflective, and hybrid approaches to scientific argumentation. *International Journal of Educational Technology in Higher Education, 23*, Article 38. https://doi.org/10.1186/s41239-026-00614-9

Bakharia, A., & Corrin, L. (2025). Revisiting Laurillard's Conversational Framework in the GenAI era. In S. Barker, S. Kelly, R. McInnes, & S. Dinmore (Eds.), *Future focussed: Educating in an era of continuous change. Proceedings ASCILITE 2025, Adelaide* (pp. 511–516). https://doi.org/10.65106/apubs.2025.2702

Boud, D., & Molloy, E. (2013). Rethinking models of feedback for learning: The challenge of design. *Assessment & Evaluation in Higher Education, 38*(6), 698-712. https://doi.org/10.1080/02602938.2012.691462

Chan, C. K. Y., & Hu, W. (2023). Students' voices on generative AI: Perceptions, benefits, and challenges in higher education. *International Journal of Educational Technology in Higher Education, 20*, Article 43. https://doi.org/10.1186/s41239-023-00411-8

Cole, M. (1996). *Cultural psychology: A once and future discipline.* Harvard University Press.

Kasneci, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günnemann, S., Hüllermeier, E., Krusche, S., Kutyniok, G., Michaeli, T., Nerdel, C., Pfeffer, J., Poquet, O., Sailer, M., Schmidt, A., Seidel, T., ... Kasneci, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences, 103*, Article 102274. https://doi.org/10.1016/j.lindif.2023.102274

Darejeh, A., Marcus, N., & Sweller, J. (2022). Increasing learner interactions with E-learning systems can either decrease or increase cognitive load depending on the nature of the interaction. *L'Année psychologique/Topics in Cognitive Psychology, 122*(3), 405–437. https://doi.org/10.3917/anpsy1.223.0405

Darejeh, A., Liu, D., & Mashayekh, S. (2025). Filmmaking education using virtual reality and generative AI for real-time feedback in simulated environments. In 2025 *IEEE International Symposium on Mixed and Augmented Reality Adjunct (ISMAR-Adjunct)* (pp. 708–710). IEEE. https://doi.org/10.1109/ISMAR-Adjunct68609.2025.00151

Hackl, V., Müller, A. E., & Sailer, M. (2026). The AI literacy heptagon: A structured approach to AI literacy in higher education. *Computers and Education: Artificial Intelligence, 10*, Article 100540. https://doi.org/10.1016/j.caeai.2026.100540

Long, D., & Magerko, B. (2020). What is AI literacy? Competencies and design considerations. *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, 1-16. https://doi.org/10.1145/3313831.3376727

Mashayekh, S. (2022). Agentic learners and task negotiation: How is task response constructed? *Studies in Educational Evaluation, 73*, 101149. https://doi.org/10.1016/j.stueduc.2022.101149

McGuirk, K. (2025). Navigating generative AI in higher education: A framework for educator decision-making. In S. Barker, S. Kelly, R. McInnes, & S. Dinmore (Eds.), *Future focussed: Educating in an era of continuous change. Proceedings ASCILITE 2025, Adelaide* (pp. 545–550). https://doi.org/10.65106/apubs.2025.2657

Qian, Y. (2025). Pedagogical applications of generative AI in higher education: A systematic review of the field. *TechTrends, 69*, 1105–1120. https://doi.org/10.1007/s11528-025-01100-1

Rogoff, B. (1995). Observing sociocultural activity on three planes: Participatory appropriation, guided participation, and apprenticeship. In J. V. Wertsch, P. del Río, & A. Alvarez (Eds.), *Sociocultural studies of mind* (pp. 139-164). Cambridge University Press.

Sargazi Moghadam, T., Darejeh, A., Delaramifar, M., & Mashayekh, S. (2024). Toward an artificial intelligence-based decision framework for developing adaptive e-learning systems to impact learners' emotions. *Interactive Learning Environments, 32*(7), 3665–3685. https://doi.org/10.1080/10494820.2023.2188398

Tai, J., Ajjawi, R., Boud, D., Dawson, P., & Panadero, E. (2018). Developing evaluative judgement: Enabling students to make decisions about the quality of work. *Higher Education, 76*(3), 467-481. https://doi.org/10.1007/s10734-017-0220-3

UNESCO. (2023). *Guidance for generative AI in education and research*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000386693

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Wertsch, J. V. (1991). *Voices of the mind: A sociocultural approach to mediated action*. Harvard University Press.

Xia, Q., Liu, Q., Tlili, A., & Chiu, T. K. F. (2026). A systematic literature review on designing self-regulated learning using generative artificial intelligence and its future research directions. *Computers & Education, 240*, Article 105465. https://doi.org/10.1016/j.compedu.2025.105465

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