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The Future is Connection:

Collaboration, Creativity and Compassion in a Digital Society

Mastering the art of human-centred global collaboration: Designing AI bots as teammates in higher education

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Higher education largely frames generative AI (GAI) as a productivity tool, overlooking a relational problem: how globally distributed student teams build shared understanding and trust. This paper reports on two conversational AI bots built on BoodleBox and designed as "teammates" rather than assistants: AINO, used in an in-person Erasmus+ Blended Intensive Programme (BIP) in Finland, and Collaboration Cosmo, used in the eight-week, fully virtual Cosmogogy Collaborative (CosCollab). Drawing on Cosmogogy's Human-AI-World ecosystem, we argue that an AI teammate's value lies as much in the relational infrastructure it holds (memory, mediation, inclusion) as in its outputs. Analysis of CosCollab chat logs identified the roles Cosmo assumed, while reflexive thematic analysis of BIP focus group and reflection data revealed four themes: expectation setting, bot dominance and the anthropomorphisation paradox, language equity, and AI as instrumental partner versus formative presence. We propose design refinements for AI-embedded global collaboration.

Keywords: Cosmogogy, agentic AI, Human-AI-World ecosystem, relational partnership, socially shared regulation of learning, global collaboration, qualitative

Introduction

Higher education is under sustained pressure to prepare graduates for a workplace being reshaped by generative AI (GAI) (Portocarrero Ramos et al., 2025). Much of the current debate still positions GAI as a productivity tool: something that drafts, summarises, or checks work, and is otherwise a risk to be managed through academic integrity policies (Memon & Kwan, 2025). This framing casts AI in a "master-servant dynamic," where the human directs and the AI simply executes (Yan, 2025). It also overlooks a distinctly relational problem: globally distributed teams working asynchronously across time zones, languages, and cultures struggle to build the shared understanding and trust that collaboration depends on. Treating AI purely as an individual productivity aid does not solve this relational-coordination problem, and may work against it (Darban, 2024).

This paper argues that AI can be deliberately designed not as a subordinate tool but as a teammate and relational partner, whose value lies as much in how it holds a team together as in what it produces, inviting engagement, negotiation and even discomfort that an instrumental tool would not surface (Chaaban et al., 2026). We explore this through two BoodleBox bots: AINO (AI Network Orchestrator), used in a largely in-person Erasmus+ Blended Intensive Programme (BIP), and Collaboration Cosmo, used in the virtual Cosmogogy Collaborative (CosCollab). Drawing on BIP focus group and reflection data and CosCollab chat logs, we examine students' experiences of relational AI and propose the next iteration of AI bot design.

Theoretical foundations: towards a relational partnership model

Cosmogogy and the Human-AI-World ecosystem

Cosmogogy (Lindsay, 2016) is a theory that proposes a shift from learning about the world to learning with it, rejecting the closed-tank model of education, where learners are fed information cut off from the real systems they will work within (Illich, 1971). Cosmogogy ideates collaborative cross-border learning in which students,

educators, AI, and the wider world are co-evolving participants. This is operationalised through the Human-AI-World (HAW) ecosystem: the Human domain contributes autonomy, ethical judgement, and lived experience; the AI domain shifts from oracle or subordinate tool to genuine collaborative partner, providing cognitive augmentation, persistent memory, and critical provocation; the World domain grounds the work in authentic challenges and relational accountability. Navigating this ecosystem well requires the Global Collaborator Mindset, with attributes of Connection, Openness, Autonomy, Innovation (Lindsay & Redmond, 2024), and now a fifth disposition made newly urgent by conversational bots in learning environments: Creative Agency, namely the willingness to originate ideas rather than simply edit what AI produces.

From regulation to relationship: Theorising the AI bot as a learning partner

A second body of theory speaks more directly to the AI teammate dynamic. Socially shared regulation of learning (SSRL) theory holds that collaborative groups negotiate shared understanding, goals, and strategies across recursive cycles (Hadwin et al., 2018). Recent models show AI bots can detect, diagnose, and act on "trigger" moments within those cycles as a genuine regulatory partner rather than an external tool, using Human-AI Shared Regulation in Learning (HASRL) as a conceptual framework (Järvelä et al., 2023). Building a metacognitive AI to do this requires a design brief that functions as a negotiated, relational contract with its team (Edwards et al., 2025). Framing AI as a partner rather than a tool paradoxically supports critical interaction alongside cognitive offloading, because it carries a sense of shared ownership that pure delegation does not (Wang & Zhang, 2026). Engagement is not simply frequency of AI use; students also show agency by choosing when not to use it (Chaaban et al., 2026; Reeve & Tseng, 2011). Together, this literature converges on a claim central to this paper: an AI bot as teammate becomes a relational partner not by being more capable, but by being designed for the negotiation and give-and-take of trust, control, and accountability that a team requires.

Designing Collaboration Cosmo and AINO as teammates

Both AI bots were built on BoodleBox, a secure, multi-model education platform that gives users access to several leading AI models within one shared workspace. Its custom chatbot builder lets a bot's persona, tone, and pedagogical boundaries be authored explicitly. The shared conversation thread means that an AI teammate's contributions stay as visible to the group as a human member. The CosCollab, an eight-week pilot supported by the International Council for Open and Distance Education (ICDE) Technology and Innovation Network (TIN), connected students and educators from Europe, the Americas, and Africa in fully virtual teams to tackle a shared global sustainability challenge, culminating in a co-created digital pitch. These teams rarely met synchronously, therefore, "Collaboration Cosmo" (Cosmo) was designed as an always-available "collaborative buddy": a mechanism suited to asynchronous work. Rather than pacing live turn-taking, it monitored distributed team members and their contributions (Lindsay & Al-Tawil, 2026). It contributed ideas when discussions stalled, tracked decisions and action items, synthesised conversations and progress, and maintained a single shared conversation thread, as opposed to fragmented private AI chats, visible to the whole team and project leaders. Students described the value of being able to see what team members did when they were away, with Cosmo functioning less as a note-taker than as a persistent continuity bridge and ideational co-creation partner.

The BIP, an Erasmus+ funded one-month course focusing on AI Pedagogy and Well Being, involved 31 students from education- and IT-related graduate and postgraduate programs across six European universities. It commenced as an online experience and in week three participants converged in Jyväskylä, Finland, for a five-day collaborative team-based experience. Students worked intensively, sitting physically around a table with AI bot "AINO" present in a shared BoodleBox chat. Group work culminated in students designing and presenting their own AI bot for educational purposes. AINO's design brief positioned it as a peer learning partner that should "contribute to collaborative thinking without hijacking it" and "notice who hasn't spoken and invite their perspective," but never "think for the team or provide all the answers" (Lindsay & Madtha, 2026).

Data collection and analysis

In each project qualitative data was gathered and analysed for evidence of AI support for collaborative learning. For CosCollab, chat-log transcripts from five student-team BoodleBox workspaces were collected. This provided a complete, non-intrusive record of asynchronous collaborative dynamics between students and with Cosmo. Deductive and inductive coding (Braun & Clarke, 2019) was applied to reveal patterns which we used to categorise Cosmo's roles within the team.

The BIP was chosen as a contrasting set of data specifically collected at a synchronous multi-day workshop. The BIP data included two sets: 1. the transcript of a focus group discussion involving seven students across teams; 2. course-wide Padlet reflections on AI chatbots in teaching and learning, collected independently of the focus group using the "Project Zero '3 ideas, 2 questions, 1 metaphor'" thinking routine. The transcript of the focus group discussion and Padlet reflections were analysed following Braun and Clarke's (2019) reflexive thematic analysis, an inductive approach chosen to let themes emerge from students' own lived experience of working with AINO. The analysis drew on Vygotsky's (1978) sociocultural theory, framing AINO as a "more knowledgeable other" scaffolding "learners' zone of proximal development."

Discussion: Synchrony regimes and mastering relational partnership

Both CosCollab and BIP asked students to relate to their AI teammate across different synchrony regimes. In CosCollab's fully virtual teams, the shared text thread was the collaborative space itself. Table 1 shares some of the highlighted roles that Cosmo took on.

Table 1
Collaboration Cosmo key highlighted roles

Cosmo's AI role	**Implications**
Collaboration conductor	Facilitated collaboration by structuring tasks, suggesting next steps, and helping coordination across time zones and tools.
Knowledge producer & director	Acted like a team member: answered questions, offered suggestions, engaged in light identity talk, and acknowledged limitations or corrected misunderstandings, making its boundaries visible.
Lead analyst	Generated feasibility ratings, approached problems from multiple perspectives, and created comparative frameworks across contexts and systems.
Co-author	Generated the first full drafts, provided revisions upon request. Participants' roles often shifted from authors to editors.

For BIP, course-wide Padlet reflections echo one student's view that they "used to think there were barriers to learning collaboratively that were too hard to solve" but now believed "AI, carefully designed and used, is a good solution to cross-border group learning" (Madtha, 2026). BIP teams had to narrate live spoken discussion into text for AINO, an effort several found awkward ("why can't I just talk to you? You're here."), though for weaker-English teams this same requirement became an asset. This matters for SSRL theory: Järvelä et al.'s (2023) HASRL model assumes AI can reliably access a team's regulatory activity, an assumption that holds in text-mediated settings but breaks down when synchronous discussion dominates and AINO is structurally excluded unless a human translates that talk into text. Four themes emerged from this engagement (Table 2).

Table 2.
Summary of thematic analysis: AINO as a relational AI teammate

Main themes	Key findings from sub-themes
1. Expectation setting	Students expected transactional AI; AINO's Socratic style initially overwhelmed, but expectations recalibrated with experience – recommend structured onboarding.
2. Bot dominance and anthropomorphisation paradox	AINO's inclusion-driven persistence felt coercive ("bullied"); students hesitated to redirect it as they would a tool, despite holding that authority.
3. Mediation, inclusion and language equity	AINO functioned as mediator/connector, bridging language barriers for non-native speakers and flattening participation.
4. Instrumental partner vs. formative presence	Students split between describing AINO as a functional "assistant" and a relational, gendered presence – relational uptake is not automatic or uniform.

Embedding AI bots into collaborative learning cuts both ways. AINO reduced coordination confusion across a difficult hybrid format, but the same synchrony mismatch compounded the dominance concerns in Theme 2: an AI paced for text-only conversation rarely suits a team also talking live around a table. Our findings add a relational, not just cognitive, account of these risks. Mastering human-centred global collaboration means negotiating a horizontal partnership where control can be renegotiated, yet negotiation was what students found hardest, having already begun relating to AINO as a social presence rather than a configurable tool. An AI teammate can share cognitive labour, but ethical judgement, verification, and accountability must stay human.

Future design directions

Findings directly imply future AI bot design for collaborative synchronous and/or asynchronous team-based work, as shown in Table 3.

Table 3.
Design recommendations arising from the findings

Recommendation	Rationale
Onboarding before deployment	A short orientation to AINO's questioning, non-answering style before it starts, addressing the readiness gap (Theme 1).
A "quiet unless invited" mode	AINO stays quiet in co-present sessions until the team brings it in, instead of pacing as if fully virtual; BoodleBox already supports human-only chat (Themes 1–2).
Easier ways to redirect the bot	Simple pacing/turn-taking commands so teams do not have to override an anthropomorphised presence unaided (Theme 2).
A designed-in mediation role	AINO's language-bridging function becomes a deliberate feature rather than incidental behaviour (Theme 3).

Conclusion

To graduate well into a GAI-enabled digital society, higher education must move past treating AI as either a productivity tool or an idealised teammate and instead design it as a relational partner whose authority students can genuinely negotiate. Our evidence from the BIP project and CosCollab pilot shows AI can hold real relational infrastructure for a global team (memory, mediation, inclusion), but that this same relational presence can quietly outpace students' willingness to redirect it. Setting the two projects side by side also shows that this challenge is not uniform: a fully virtual global team and a team talking live around a table each ask something different of an AI teammate, and of the humans learning to work with it. Mastering human-centred global collaboration with AI is therefore not a one-off design decision but an ongoing negotiation across both the global and the local, one that the next iteration of this work must build into how AI teammates are introduced, structured, and revisited.

Ethics and consent

HREC Project ID: ETH2026-0023, University of Southern Queensland, Australia.

Data collection in both the BIP and CosCollab included privacy and research notice, formal participant consent, and anonymisation. No sensitive information was prompted in the data collection process.

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