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The Future is Connection:

Collaboration, Creativity and Compassion in a Digital Society

When teachers and game designers evaluate together: A participatory co-discovery study of educational game design gaps

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This concise paper reports on a participatory co-discovery approach in a project that brought together six primary school teachers and six game designers (based in Australia) to collaboratively evaluate Mammals, a digital science game designed for K–5 learners. Using affinity mapping technique, the study surfaces four themes: learning through play, game critique, expectations versus potentialities, and classroom application. A central finding — reached independently by both sets of experts — is the game's critical absence of feedback, scaffolding, and visible goals. The study contributes a replicable co-evaluative methodology that makes tacit professional knowledge visible across the educator–designer divide, with direct implications for human-centered educational game design process and addressing the voices of teachers and game designers through the educational game designing process.

Keywords: human-centered design, participatory design, educational games, affinity mapping, teacher–designer collaboration, co-design practice, interactivity

Introduction and context

A persistent gap exists between what teachers need from educational games (EGs) and what game designers produce. This gap is rooted not in technical failure but in the structural absence of dialogue between these two expert groups during design and evaluation (Hamdaoui et al., 2019; Tobar-Muñoz et al., 2023). Teachers bring deep knowledge of learner needs, curriculum alignment, and classroom constraints while game designers bring expertise in interaction design, motivation systems, and engagement mechanics. When these perspectives remain siloed, the result is often a game that excels at one dimension while failing at the other. This study addresses that gap through a human-centred participatory design methodology aligned with the ASCILITE 2026 theme of Human-Centred Learning Design — which calls for pedagogical approaches that prioritize human connection and relationships through design and play, including feedback systems, assessment approaches, and community-based learning. Recent scholarship reinforces the urgency: Alfredo et al. (2024) demonstrate that excluding teachers and learners from EdTech design leads to reduced trust, weaker adoption, and diminished accountability; Kontkanen et al. (2024) identify a continuing research gap in cross-community co-design of digital games. Two research questions guide this study:

RQ1: How do primary school teachers and game designers differ in evaluating the educational value and design quality of a digital educational game?
RQ2: What does a structured co-discovery session reveal about human-centred design gaps in educational game development?

Methodology

The study is situated within a constructivist–interpretivist paradigm: it assumes that meaningful knowledge of an educational game's value is co-constructed through participants' lived professional experience of evaluating it, and that this meaning is best accessed through participants' own interpretive accounts rather than an external measure of "correct" evaluation. Operationally, this paradigm is enacted through participatory design research methods (Muller et al., 1993), which structured how data were collected and analysed. Dewey's (1938) theory of experience and Kolb's (1984) experiential learning cycle are not used as coding frameworks in the analysis; rather, they are applied afterward, in the Discussion, as interpretive lenses for making sense of the inductively derived themes. Könings et al.'s (2007) Combination-of-Perspectives (COOP) model plays a further, distinct role: it is a theoretical positioning device used to situate this study's contribution relative to prior co-design research, rather than a method applied to the data itself. This concise paper reports Phases 1

and 2 of a larger six-phase participatory co-design and co-evaluation project. Phases 1 and 2 — an independent evaluation phase and a co-discovery affinity-mapping workshop phase — are the focus of the methodology, findings, and discussion presented here. Subsequent phases of the project extend these co-evaluation findings into co-design feedback and ideation activities with the same participant groups and are reported elsewhere. Twelve participants — six primary school teachers (T_1–T_6) and six game designers (GD_1–GD_6) based in Melbourne, Australia — evaluated Mammals (Tinybop Schools), a K–5 digital science simulation selected from a pool of 46 EGs for its exploratory, non-linear design and absence of explicit feedback or assessment mechanisms. Ethics approval was obtained from the university; all participants provided informed consent, and the results are anonymized throughout. Data collection occurred across two phases via Zoom. In Phase 1, participants independently evaluated the game using structured four-quadrant sheets (interesting / boring / engaging / not motivating) hosted on MURAL. In Phase 2, participants engaged in facilitated co-discovery affinity mapping workshops, clustering and comparing their evaluative responses collaboratively. Sessions were audio-visually recorded and transcribed. Data were analysed using Braun and Clarke's (2006) six-step thematic analysis in NVivo 10; themes were derived inductively from the data, with Dewey's (1938) theory of experience and Kolb's (1984) experiential learning cycle applied interpretively during the discussion phase, as detailed above. Dewey's concepts of interaction and continuity further informed this interpretation — specifically, how each participant's engagement with the game environment connected to their prior professional experience, and how the individually completed, reflective, hands-on evaluation activity that preceded the workshops shaped their subsequent co-discovery contributions. The researcher occupied a dual role as facilitator and curriculum design practitioner throughout the study. This positionality informed interpretive decisions within the constructivist–interpretivist paradigm and is acknowledged as a reflexive dimension of the qualitative analysis process.

Findings: Convergences and divergences across four themes

Four themes emerged. Table 1 summarizes the key convergences and divergences between the two participant groups.

Table 1
Convergences and divergences between teachers and game designers' evaluations of Mammals

Theme	Teachers	Game designers
1. Learning through play	Overwhelming text; confusion causes disengagement; no assessment tasks	Rich content; discovery-based approach valued; no entry point or goals
2. Game critique	Interface is main asset; not a "real game;" needs feedback and achievements	High-quality visuals; absent mechanics; no feedback on correctness
3. Expectations vs potentialities	Exploratory potential; lacks hooks; no way to demonstrate learning	Builds comparative knowledge; rich but lacks didactic scaffolding
4. Classroom application	Supplement only; time constraints; limited accessibility	Suitable for exploration; group discussion could compensate for absent assessment

The most striking finding was a convergence neither group anticipated. Teachers and game designers, evaluating independently before any dialogue, arrived at the same core diagnosis: the game lacks feedback, clear goals, and scaffolded progression. Teachers: "the major problem is that there was no feedback" (T_1); "no assessment tasks to evaluate what students went through or learned" (T_4). Game designers: "there was no feedback to where I answered the question" (GD_1); "no visible achievement; no progress line" (GD_2). In Dewey's (1938) terms, this absence of feedback severs the purposeful structure that transforms raw experience into directed learning. In Kolb's (1984) cycle, it prevents the shift from concrete experience to reflective observation. Interestingly, where the two expert groups *diverged* was in their evaluative frames of EG. Teachers foregrounded curriculum accountability: "there are no learning outcomes…how do I know what they completed?" (T_3). Game designers accepted the exploratory logic but identified structural weaknesses: "it is not structured — depends on the type of learner you are" (GD_4). This divergence in professional frame — not visible within either group's experience of the game in isolation — only became legible through co-evaluation.

Evidence from affinity mapping

The findings above are grounded in the affinity mapping artefacts produced during the co-discovery workshops. Figures 1 and 2 show the clusters produced by teachers (yellow) and game designers (green) for Theme 2: Game Critique. Each sticky note represents a direct participant observation; the oval boundary groups related ideas. Figure 3 presents the synthesis "parallels" diagram produced during the concluding workshop activity.

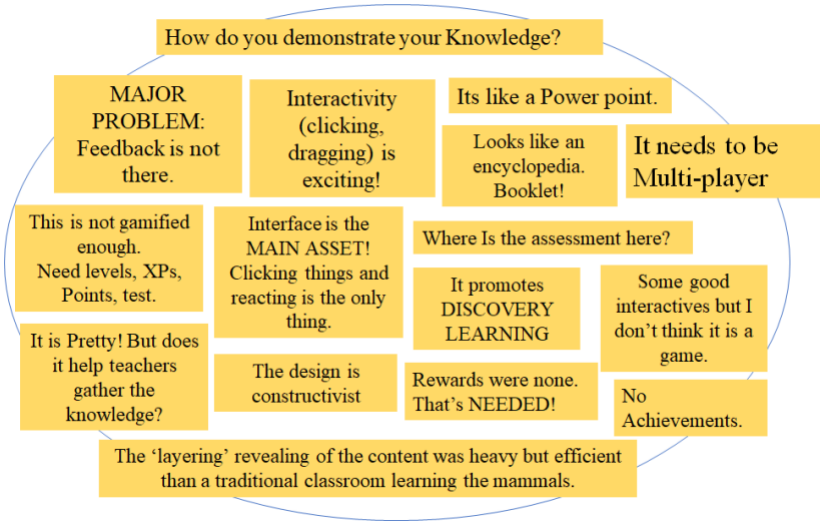


Figure 1. All teacher participants quotes are presented as an affinity cluster (Theme 2 — Game Critique)

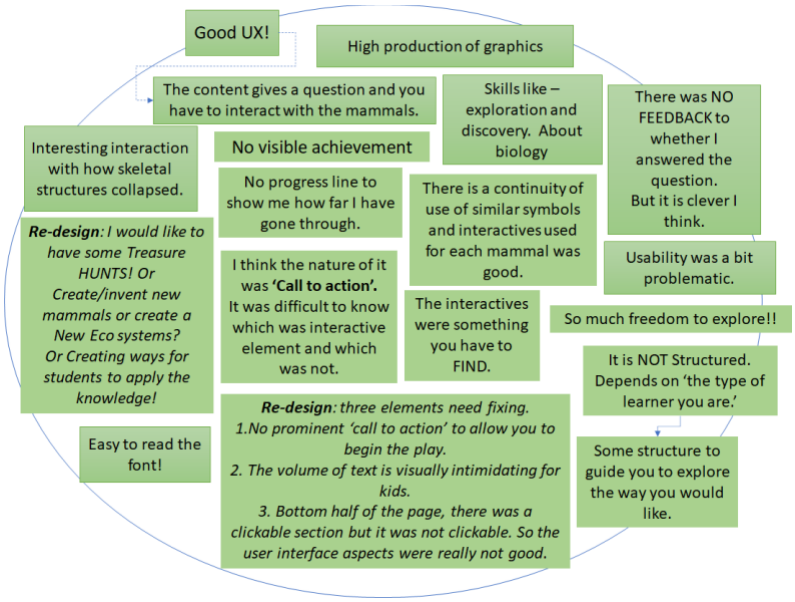


Figure 2. All game designer participants' quotes are presented affinity cluster (Theme 2 — Game Critique)

The teachers' cluster (Figure 1) is anchored by assessment and feedback absence: "MAJOR PROBLEM: Feedback is not there" and "Where is the assessment here?" alongside recognition of interface strengths: "Interface is the MAIN ASSET!" The designers' cluster (Figure 2) maps the same territory from a design-practice lens, identifying specific usability failures and generating concrete redesign ideation — treasure hunts, ecosystem creation, explicit call-to-action elements. The contrast between constraint-focused yellow notes and ideation-rich green notes illustrates how co-evaluation externalizes tacit professional knowledge into a shared, actionable form that neither group produces alone.

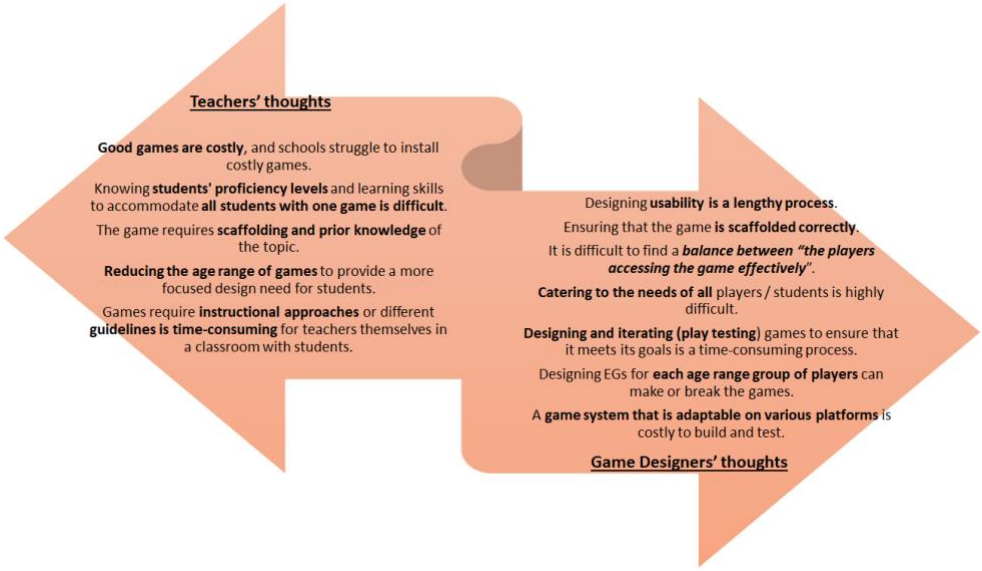


Figure 3. A structural parallel between teachers' and game designers' "pains and gains" in relation to educational games design and gameplay— produced during the co-discovery workshop synthesis activity.

Figure 3 reveals structural homologies that would remain invisible within each group's isolated discourse. Teachers' concern about cost and student diversity maps directly onto designers' acknowledgment that usability design is expensive and catering to all player types is highly difficult. The scaffolding problem identified by teachers mirrors designers' recognition that ensuring a game is scaffolded correctly is a core design challenge. These parallels require the dialogic process of co-discovery to become visible — they do not emerge from interviews with either individual expertise alone.

Discussion and implications

This study makes two primary contributions. First, it demonstrates that co-evaluative participatory methods produce a more complete account of an educational game's design strengths and gaps than either experts' group could generate alone. This extends Könings et al.'s (2007) Combination-of-Perspectives (COOP) model from co-design to co-evaluation — an underexplored but productive shift. The affinity mapping figures are not merely illustrations; they are primary research artefacts that make the evaluative process transparent, auditable, and transferable. Second, the convergence on feedback absence as the game's primary failure — reached independently by teachers and designers — directly advances the ASCILITE 2026 agenda of Human-Centred Learning Design by demonstrating that feedback systems cannot be treated as a design add-on. Both expert groups in the EG design process arrived at a similar association of concepts without prompting from the other; it was the co-discovery process that made this *convergence* visible and analytically productive. This finding reinforces recent systematic reviews showing that EdTech systems fail to achieve classroom adoption when they neglect learner and educator feedback needs and insufficiently involve these stakeholders in the development process (Alfredo et al., 2024; Topali et al., 2024). The study also reveals a subtler finding: the two expert groups make different assumptions about who carries the pedagogical work. Game designer participants proposed workarounds — group discussion, teacher-led reflection — inadvertently displace the assessment burden onto the very teachers who are already stretched by time and curriculum constraints. This misalignment is structurally invisible unless teachers and game designers are placed in direct, facilitated dialogue. As Kangas et al. (2025) found in a recent study of pre-service teachers co-designing digital games, the scaffolding and time concerns raised by teachers and the design complexity acknowledged by game designers represent *parallel* but unresolved professional tensions that structured co-evaluation can surface and address.

Conclusion

Participatory co-evaluation of educational games using affinity mapping to bring teachers and game designers into structured dialogue around the same artefact — offers a scalable, replicable methodology for human-centered learning design research. It surfaces convergences and divergences that neither community can

identify alone, generates actionable design implications grounded in both pedagogical and interaction-design expertise, and makes the evaluative process itself transparent as a research contribution. These findings are exploratory in scope; replication with larger and more diverse participant groups across multiple game types and contexts will be necessary before broader generalizations can be drawn. Future research should examine how co-evaluative findings translate into concrete design changes, test the method's applicability across different learner age groups, game genres, and cultural contexts, and explore how AI-supported and human-centred approaches might jointly ease the tensions between different experts in the co-creation of educational games.

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