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The Future is Connection:

Collaboration, Creativity and Compassion in a Digital Society

Making teamwork visible: Using routine traces to support process-focused feedback in project-based learning

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Supporting student teamwork in project-based learning requires timely, contextual feedback on how collaboration is developing, not only retrospective evaluation of final outputs. However, teamwork processes are often difficult for educators to observe while projects are underway, limiting opportunities for meaningful process-focused feedback. This paper presents a design case study examining how routine traces of teamwork, generated through ordinary course activities, can support AI-assisted draft feedback in an undergraduate IT project management course. The study originated from an equity, diversity and inclusion initiative involving interviews with neurodivergent students, which surfaced recurring teamwork visibility challenges relevant to the broader student population. These challenges informed a prototype that organises available traces and course context to generate AI-assisted draft feedback for teaching assistant review. An exploratory evaluation with 32 students and four teaching assistants found that feedback was broadly perceived as relevant, aligned, actionable and appropriate, while identifying boundary conditions around trace richness, feedback tone, student expectations and the necessity of educator mediation. The paper contributes teamwork visibility as a pedagogical design condition, routine traces as a practical evidence base for collaborative feedback, and exploratory evidence from student and educator perspectives.

Keywords: learning analytics, collaborative learning, process-focused feedback, teamwork visibility, AI-assisted feedback, project-based learning, equity and inclusion

Introduction

Project-based learning engages students with authentic problems requiring disciplinary knowledge, communication, and sustained collaboration (Helle et al., 2006). In computing and engineering, students must communicate, coordinate interdependent tasks, negotiate roles, and contribute to shared goals (Borrego et al., 2013; Oakley et al., 2004). Yet collaboration does not emerge automatically: it develops through ongoing planning, communication, task allocation, and shared regulation of work (Järvelä & Hadwin, 2013), while educators often encounter teams only through artefacts, peer assessment, or end-of-project reflections. Difficulties may therefore remain invisible until opportunities for support have diminished.

Feedback is increasingly understood as a process through which learners interpret evidence and act on it (Carless & Boud, 2018; Winstone et al., 2017), so process-focused teamwork feedback requires visibility into collaboration while unfolding. Neurodivergent students are particularly affected when expectations are unclear, communication barriers arise, or concerns remain unseen (Clouder et al., 2020), although improving teamwork accessibility benefits students more broadly (Hamilton & Petty, 2023).

Learning analytics can make learning processes visible (Wise, 2014), and collaborative learning analytics uses trace data to support how teams learn together (Martinez-Maldonado et al., 2021; Wise et al., 2021). However, the field focuses predominantly on individual behaviour and prediction (Siemens, 2013), its tools are criticised for weak grounding in feedback theory (Pardo, 2018), and little attention has been paid to how routine traces, lightweight records from ordinary teaching and team practice, might provide a practical, low-burden basis for process-focused teamwork feedback.

This paper addresses that gap through a design case study in an undergraduate IT project management course. The work originated in an equity, diversity and inclusion (EDI) initiative involving interviews with neurodivergent students, whose accounts surfaced teamwork visibility challenges relevant to the wider

cohort, and informed generating AI-assisted draft feedback for teaching assistant review, explored in a six-week intensive course. Three research questions guide the study:

RQ1: What teamwork visibility challenges emerged from neurodivergent student interviews and teaching staff check-in records?
RQ2: What design considerations informed a prototype for process-focused teamwork feedback?
RQ3: How did students and teaching staff perceive AI-assisted draft feedback generated from these traces?

The paper contributes a design case demonstrating how routine teamwork traces can support AI-assisted draft feedback, while identifying the conditions under which such feedback is perceived as relevant, actionable, and appropriate.

Background

Teamwork as a developmental process and the challenge of visibility

Socially shared regulation of learning (SSRL) theory holds that effective collaboration requires group members to jointly establish goals, monitor collective progress and adapt their ways of working (Järvelä & Hadwin, 2013). This shift from individual to collective regulation distinguishes genuine collaboration from parallel individual work (Järvelä et al., 2016) and is associated with group performance and knowledge building (Järvelä et al., 2015) but rarely emerges without structured support. Common supports, such as peer assessment, reflective tasks and consultations, operate retrospectively or at single points: peer assessment typically occurs near submission and can feel threatening or miss informal contributions. This points to what we term teamwork visibility: the extent to which collaboration becomes available for pedagogical action while a project is still running. Where visibility is limited, educators encounter teamwork mainly through its outcomes, when opportunities for developmental feedback have often passed.

This visibility problem is not experienced equally by all students. Neurodivergent students, including students with autism, ADHD, dyslexia and related differences, often experience uncertainty about team expectations, difficulty navigating unwritten communication norms, and heightened consequences when team difficulties remain invisible until late in a project (Clouder et al., 2020). Bridging their own communication styles and normative group expectations adds cognitive and emotional load (Hamilton & Petty, 2023). These challenges are not confined to neurodivergent students. The neurodiversity paradigm frames cognitive differences as natural variation rather than deficit, directing attention to institutional designs that are fragile for some and improvable for all (Hamilton & Petty, 2023).

Process-focused feedback in team-based learning

Winstone et al. (2017) identified learner agency as central to feedback uptake, and Carless and Boud (2018) extended this through feedback literacy: the capacities to seek, interpret and use feedback productively. In team-based work, process-focused feedback, directing attention to how teams communicate, distribute responsibility and distribute responsibility while collaboration is unfolding, can help teams act before difficulties become entrenched (Maheshi et al., 2024). Such feedback must be timely, contextual, and actionable (Carless & Boud, 2018), requiring evidence of collaboration processes rather than only outcomes.

Learning analytics and AI-assisted feedback

Learning analytics supports learning only when connected to meaningful educational questions, interpreted in context and used to support action (Wise, 2014); a gap remains between systems that generate data and those that produce actionable insight (Pardo, 2018). Collaborative learning analytics addresses this individual focus by using trace data to support how teams learn together (Martinez-Maldonado et al., 2021; Wise et al., 2021), and group awareness tools show that externalising collaboration indicators supports reflection (Järvelä et al., 2015). However, visibility alone does not produce adaptive change, and richer multimodal approaches require specialised infrastructure that limits scalability (Martinez-Maldonado et al., 2021), leaving a gap that exists between high-infrastructure analytics and everyday project-based teaching, which routine traces are intended to address.

Large language models can turn contextual records into personalised, formative feedback at a scale previously impractical (Dai et al., 2024; Maheshi et al., 2024). However, generated feedback can misread partial evidence and lacks the relational judgement of educators. A human-in-the-loop model, in which AI drafts feedback for educator review rather than delivering it autonomously, therefore preserves educator agency, contextual appropriateness, and the relational dimensions of feedback that students value.

These literatures approach teamwork visibility only obliquely: group awareness tools display indicators to team members, teacher noticing concerns momentary educator attention, and collaboration analytics and trace-based monitoring model collaborative activity. Teamwork visibility instead names a prior condition, whether usable evidence of collaboration exists at all, making it a property of the learning design. How this is achieved in routine teaching remains unaddressed; this study explores routine traces with AI-assisted drafting as one response.

Method

This design case study documents how a teaching problem was identified, translated into a design response, and examined through initial evaluation (Barab & Squire, 2004). The case is one offering of an undergraduate IT project management course: a six-week intensive period, 155 students in approximately 45 teams, and 10 teaching assistants (TAs). Phase 1 characterised the problem retrospectively with former students; Phase 2 examined whether comparable challenges were observable during live delivery and whether a design response was workable. The two phases are complementary rather than sequential, and inform problem exploration (RQ1), design (RQ2) and exploratory evaluation (RQ3) respectively.

Phase 1: equity, diversity, and inclusion interviews

The first phase arose from an EDI initiative aimed at improving learning experiences for neurodivergent students in project-based computing education. Participants were recruited by email; all had completed the course and self-identified as neurodivergent. Seven semi-structured interviews (November 2025 to January 2026, in person and online) were conducted with neurodivergent students from earlier course cohorts, spanning undergraduate and postgraduate levels. The guide covered project experience, teamwork, communication, assessment and support-seeking. Interviews lasted approximately 60 minutes and were audio-recorded and transcribed verbatim or documented as detailed notes; both transcriptions and notes were analysed. Participants consistently described difficulties interpreting expectations, communicating with team members, raising concerns, and addressing problems before they escalated. Interview records were analysed thematically (Braun & Clarke, 2006), with findings interpreted through a neurodiversity perspective that emphasises support structures rather than individual deficit (Hamilton & Petty, 2023).

Phase 2: teaching and design context

The second phase took place within a six-week intensive undergraduate IT project management course enrolling 155 students in approximately 45 project teams, supported by 10 teaching assistants (TAs). Scheduled bi-weekly in-class team check-ins were a key feature of the course: TAs met individual teams to discuss progress, clarify expectations and identify concerns, documenting structured observations of progress, concerns raised, collaboration issues and follow-up guidance. Check-in records were produced by all 10 TAs as part of normal teaching. The four records quoted in the findings are labelled by record (TA-R1 to TA-R4). These records constituted the primary routine traces used in the evaluation. Interview material was coded first and inductively, generating an initial set of visibility challenges; check-in records were then coded using the same codebook with new codes added where they surfaced patterns absent from the interviews. The first two authors coded independently and resolved disagreements through discussion. Because the sources were produced for different purposes, Table 1 reports which contributed to each challenge rather than treating them as equivalent evidence. Four authors were also course designers and record producers; an author not involved in teaching reviewed the coding to reduce confirmation of the design rationale.

Prototype design

The broader design supports multiple routine trace types, including meeting notes, task allocations, reflections, peer feedback, team agreements, support-orientated checks and teaching-staff observations. The evaluation used a narrower evidence base: feedback was generated from TA-recorded Week 1 check-in observations together with the assignment specification and assessment rubrics, with identifiers removed. Draft feedback acknowledged progress, connected comments to evidence, identified a collaboration process needing attention and suggested a concrete next step, avoiding judgemental language, ranking or unsupported claims about individual contribution. Feedback was generated using OpenAI GPT-4o via the API. For each team, a single structured prompt combined the team's Week 1 TA check-in observations, the assignment specification and the assessment rubric, instructing the model to produce formative, team-level feedback comprising acknowledgement of progress, an evidence-linked observation, one collaboration process requiring attention, and one concrete next step, while avoiding judgemental language, ranking and unsupported claims about individual contribution. The same structured workflow was applied consistently across the 32 teams, with each team member receiving their own AI-assisted feedback based on the available team context and course materials. A researcher checked each output against the source records and made minor corrections where statements were unsupported. TAs then reviewed each draft and could adapt or withhold it before use. The workflow followed four steps, illustrated in Figure 1 below: traces were captured through ordinary teaching activity; organised into a structured team context; combined with course materials to generate AI-assisted draft feedback; and reviewed, adapted or withheld by TAs before use with teams.

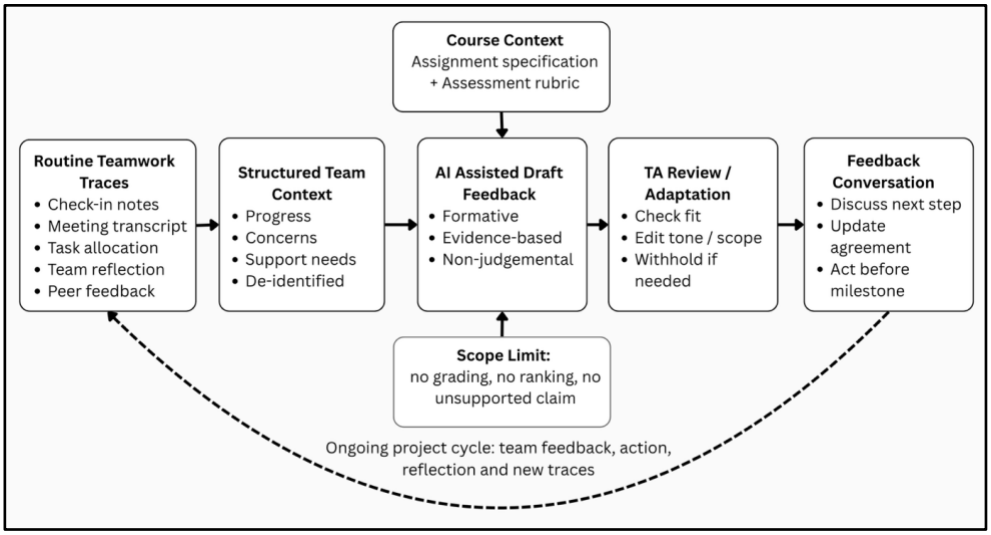


Figure 1. Workflow for process-focused teamwork feedback. Routine teamwork traces and course context are organised into a structured team context; AI-assisted draft feedback is generated using this context, the assignment specification and rubrics; teaching assistants review, adapt or withhold the feedback before using it with teams.

Before feedback was provided to students, all 32 GPT-4o-generated drafts were reviewed by a member of the research team against the source records, with minor edits made where needed, primarily to wording, tone and clarity rather than the substantive content. TAs could then adapt or withhold the feedback before it was provided to teams. Accordingly, student ratings reflect the final AI-assisted, human-reviewed feedback they received, rather than the unedited GPT-4o drafts.

Exploratory evaluation

The evaluation examined how students and TAs perceived the AI-assisted, human-reviewed Week 1 feedback generated for 32 teams; it examined perceptions of feedback quality, not changes in teamwork behaviour or learning outcomes. All students were invited via Ed to review the feedback provided to their team and voluntarily complete the evaluation survey. Thirty-two students responded (20.6% of the cohort), representing nine teams. Eight teams were represented by all members, while two of the three members of the remaining

team responded. The survey comprised four five-point Likert items (relevance to team context, alignment with expectations, actionability, tone and appropriateness) and open-ended comments. Respondents included five students who self-identified as neurodivergent; they completed the same survey as peers, and no student was asked to disclose their status.

Four TAs independently reviewed all 32 instances, rating alignment with rubric intent, appropriateness and scope, actionability, and workflow fit. This produced 128 TA ratings per item. Table 2 reports descriptive statistics across these ratings, including means and standard deviations. Inter-rater agreement was not calculated because the purpose of the TA evaluation was descriptive rather than to establish rating reliability. Data were analysed descriptively; because student responses came from individuals within team contexts, results are not treated as independent, and the evaluation supports claims about perceived feedback quality only.

Ethics and data handling

The study was approved by Monash University, project ID MUHREC 49606 & 49941. Consent was obtained separately for each source: interview participants consented during the EDI initiative; students were informed by email that de-identified check-in records, created for teaching, could be used for research and could decline without effect on feedback, grades or support; evaluation participants consented at survey completion. Identifiers were removed and free-text observations screened for indirect identifiers before any material entered the AI workflow. De-identified data were processed through a researcher-managed OpenAI API account, where inputs and outputs are not used for model training by default, with access restricted to the research team. Neurodivergence and disability-support status were self-disclosed, reported only in aggregate, and not linked to any quotation. Students were informed that AI assisted in drafting their feedback and they could raise concerns with their TA if necessary.

Findings

Findings are organised around the three research questions. RQ1 examines teamwork visibility challenges identified through EDI interviews and TA check-in records. RQ2 presents the resulting design considerations, and RQ3 reports student and TA perceptions of AI-assisted, human-reviewed feedback. EDI interview participants are labelled EDI-P1 to EDI-P7, teaching assistant records TA-R1 to TA-R4, and student survey responses S1 to S32.

Teamwork visibility challenges

The thematic analysis identified five recurring teamwork visibility challenges (Table 1). A common pattern was that difficulties often became visible only after escalation, while teams without obvious issues received limited opportunities to reflect on their practices.

Table 1
Teamwork visibility challenges identified across Phase 1 and Phase 2 data sources

Challenge	Description	Evidence source
Late surfacing of difficulties	Disengagement, contribution imbalance and communication breakdown became apparent only around key milestones.	Interviews; check-in records
Unclear contribution expectations	Students were uncertain what equitable contribution looked like, making imbalance hard to raise.	EDI interviews
Communication and support barriers	Students found it hard to raise concerns or seek TA support before problems escalated.	Interviews; check-in records
Limited visibility for progressing teams	Teams reporting adequate progress received little process-focused feedback.	Check-in records
Mismatch between stated and actual functioning	Teams described themselves as functioning well while records suggested coordination difficulties.	Check-in records

- Late surfacing of difficulties

The most consistent pattern was that teamwork problems remained invisible until they became significant:

> "I knew something wasn't working for weeks, but I didn't know how to bring it up. By the time it came out it was already a really stressful situation for everyone." (EDI-P3)

- Unclear contribution expectations

EDI participants consistently described uncertainty about what constituted an equitable contribution within their teams and when concerns should be raised:

> "I wasn't sure if I was doing too much or if they were doing too little. There was never a conversation about what we each expected. I felt like I couldn't say anything because maybe my expectations were wrong." (EDI-P1)

- Communication and support barriers

Both data sources pointed to barriers in raising concerns before difficulties escalated:

> "I didn't know if what we were dealing with was normal team stuff or something I should bring up with the TA. I didn't want to waste their time or seem like I couldn't handle it." (EDI-P6)

Some DSS-registered students, including neurodivergent students, raised issues privately after class rather than during whole-team check-ins, suggesting that even structured support mechanisms may not fully support concern-raising in group settings (Clouder et al., 2020; Hamilton & Petty, 2023).

- Limited visibility for progressing teams

Teams without obvious difficulties were also poorly served:

> "Most of the times the team would say 'All good' and I won't spend as much time with the team, as there might be other teams that needed more help and I have limited time for the check-ins. But I feel that I could have done more as there should always be something they could improve on." (TA-R3)

Progressing teams often received general encouragement rather than process-focused guidance that could help them identify and strengthen effective teamwork practices (Carless & Boud, 2018).

- Mismatch between stated and actual team functioning

Check-in records revealed a recurring gap between teams' perceptions of progress and subsequent evidence of team functioning:

> "The teams that think everything is going well, often they haven't completed their section and don't know how to track the progress of others until it's too late." (TA-R4)

Self-report alone may not reliably surface emerging difficulties.

Design considerations for the prototype

The five challenges informed three design considerations. First, use traces from existing course activities: structured TA check-in records already produced in normal delivery create regular moments at which team functioning is documented. Second, frame feedback as formative and process-focused: each instance acknowledged effort, connected comments to trace evidence, identified a process meriting attention and suggested a concrete next step (Maheshi et al., 2024; Winstone et al., 2017). Third, keep educators in the feedback loop: because traces are partial and teamwork feedback involves sensitive interpersonal matters, AI-generated feedback was a draft for TA review, ensuring visibility does not become a mechanism for deficit judgements (Hamilton & Petty, 2023).

Perceptions of AI-assisted feedback

- Finding 1: Feedback was broadly perceived as relevant, aligned, actionable, and appropriate

Descriptive ratings were positive across all dimensions for both students and TAs (Table 2). Actionability received the highest rating from both groups, while TAs also rated workflow fit highly, suggesting compatibility with existing feedback practices.

Table 2.
Descriptive survey results: student and TA perceptions of Week 1 AI-assisted feedback

Respondent group	Survey item	Mean	SD	Range
Students (n = 32)	Relevance to team context	3.89	1.02	2-5
Students (n = 32)	Alignment with expectations	4.00	0.86	3-5
Students (n = 32)	Actionability of suggestions	4.22	0.76	3-5
Students (n = 32)	Tone and appropriateness	4.11	0.96	2-5
TAs (n = 128)	Alignment with rubric intent	4.38	0.92	3-5
TAs (n = 128)	Appropriateness and scope	4.38	0.74	3-5
TAs (n = 128)	Actionability for students	4.75	0.46	4-5
TAs (n = 128)	Fit with teaching workflow	4.63	0.52	4-5

Note: five-point agreement scales; higher scores are more positive. TA ratings were based on four raters evaluating 32 feedback instances; means and standard deviations are reported across all ratings. All results are descriptive.

Several students described the feedback as specific and useful:

> "It was pretty accurate. It captured what we talked about in the check-in and gave us something concrete to work on." (S11)

> "I became the team leader because no one else showed up. I didn't know what to do. That was exactly how I felt and it would help me to know what I need to do." (S07)

These responses suggest that when meaningful team activity was captured in the available traces, the resulting feedback was perceived as contextual, specific, and actionable (Maheshi et al., 2024; Winstone et al., 2017).

- Finding 2: Perceived contextual fit depended directly on trace richness

Students who were actively involved in Week 1 check-ins generally found the feedback more reflective of their team situation than those whose experiences were not captured in available traces:

> "The feedback reflected what I had told the TA and how I was feeling about the team at that point. It felt like it was written for our team specifically, not just a generic template." (S19)

In contrast, a student absent from the first class noted:

> "It wasn't tailored specifically for me because I wasn't there in Week 1. It made sense for the others maybe, but I wasn't reflected in it." (S24)

These responses suggest that feedback quality depends on the representativeness of the underlying traces rather than the quantity of data collected (Martinez-Maldonado et al., 2021; Wise, 2014). This has important equity implications, as students who are less visible during team interactions may also be less represented in trace records. Ensuring equitable trace coverage therefore remains an important design consideration.

- Finding 3: Tone, length, and student expectations shaped how feedback was received

Open-ended responses identified three factors influencing how feedback was received, independent of content accuracy.

First, several students felt the feedback was too long or repetitive:

> "There was too much to read. Some of it was saying the same thing in different ways. I think if it was shorter and more direct I would have engaged with it more." (S14)

Second, some students perceived inconsistencies in tone:

> "The first part sounded really encouraging but then when it got to the areas to improve it felt quite cold and robotic. It made the whole thing feel a bit inconsistent." (S22)

Third, some students expected comments on project artefacts rather than teamwork processes:

> "I was expecting it to tell me if our project plan was on the right track. But it was more about how we were working as a team." (S08)

Together, these responses suggest that process-focused teamwork should be concise, maintain a consistent developmental tone, and be clearly framed as feedback on teamwork rather than project outputs (Carless & Boud, 2018).

TA comments also supported the value of human review:

> "I would use it as a starting point and adjust the wording in a couple of places to better match how I know this team communicates. But as a draft it will save me a lot of time." (TA-R2)

This supports the human-in-the-loop design principle, with TAs contributing contextual judgement regarding tone, fit, and delivery.

Discussion

Teamwork visibility as a pedagogical design condition

Educators often have limited visibility into how collaboration develops while projects are underway. The findings suggest that the challenge is not simply providing more teamwork feedback, but creating the conditions under which meaningful process-focused feedback can occur. SSRL research shows that teams must monitor and adapt how they work together, often requiring scaffolding and guidance (Järvelä & Hadwin, 2013; Järvelä et al., 2016). The visibility challenges identified in this study suggest that many teams lacked opportunities to externalise and reflect on collaboration before difficulties escalated. Feedback requires evidence of team processes while collaboration is still unfolding (Winstone et al., 2017; Carless & Boud, 2018). Rather than judging teamwork only after project completion, emerging evidence of collaboration can support timely feedback, reflection, and improvement.

Teamwork visibility is therefore a pedagogical design responsibility. Structured mechanisms such as check-ins, team reflections, working agreements, and lightweight records can make collaboration discussable while there is still time to adapt practices. Importantly, visibility benefits not only struggling teams but also those progressing smoothly, who may otherwise receive few opportunities for reflection and improvement.

We therefore conceptualise teamwork visibility as the extent to which collaboration becomes available for pedagogical action while teams can still reflect and adapt

Routine traces, feedback literacy, and equitable participation

The findings suggest that routine traces can provide a practical basis for process-focused feedback without requiring specialised analytics infrastructure or substantial additional workload. In this study, TA check-in records and course context were adequate, in this course, to generate feedback that these respondents perceived as relevant and actionable, positioning routine traces as a practical middle ground between sophisticated collaboration analytics and retrospective evaluation mechanisms (Martinez-Maldonado et al., 2021; Wise et al., 2021).

At the same time, the study reinforces an important limitation: traces are useful because they support pedagogical action, not because they provide complete representations of teamwork. Students who

recognised their experiences in the available traces generally perceived feedback as more contextual, whereas students whose circumstances were less visible found it less relevant. Consistent with Wise (2014), the value of analytics therefore depends on how meaningfully the data represents the learning activity it is intended to support. The contribution of routine traces therefore lies in making evidence usable for timely feedback.

Although the small number of neurodivergent respondents prevents firm conclusions, the findings highlight a broader design challenge: students who are less visible in team interactions may also be less represented in trace records, making equitable participation an important condition for equitable feedback. Visibility must therefore be designed carefully: traces should be transparent, consensual, focused on collaboration processes rather than personal characteristics, and interpreted as partial evidence for reflection rather than objective truth.

The EDI origins of this work further suggest that designing for students most affected by visibility challenges can reveal weaknesses in teamwork support structures more generally. The findings also extend discussions of feedback literacy. Some students expected comments on project artefacts rather than collaboration processes, suggesting that process-focused teamwork feedback may represent a distinct feedback genre. Introducing this purpose explicitly may therefore be an important component of feedback literacy development (Carless & Boud, 2018; Winstone et al., 2017).

Human-mediated AI assistance and scalable feedback practice

The exploratory evaluation suggests that AI-assisted drafting warrants further investigation as a mechanism for supporting process-focused teamwork feedback at scale. Feedback quality is necessarily bounded by the quality and representativeness of the available traces. TAs consistently positioned the feedback as useful draft content rather than finished feedback, indicating that educator review remains important for contextual fit, tone, and sensitive issues such as participation, communication, or conflict (Dai et al., 2024; Maheshi et al., 2024). AI-assisted drafting may reduce the effort required for team-level feedback, although workload was not measured in this study. Human review also serves an equity function, as communication patterns associated with neurodivergent, DSS-registered, or otherwise less visible students may be misinterpreted when trace data are considered in isolation. The contribution of the prototype is therefore not fully automated feedback, but a model of human-mediated AI assistance in which routine traces, AI drafting, and educator judgement work together to support timely and actionable feedback.

Limitations and future work

This design case study was conducted within a single six-week intensive course at one institution and therefore does not support generalisable causal claims. The seven interview participants cannot represent the full diversity of neurodivergent experiences and the five neurodivergent students among the 32 respondents were too few to examine differential impacts. Evaluation focused on perceptions at a single time point using a limited set of traces, and did not assess whether feedback changed teamwork behaviours or project outcomes. Future implementations will require transparency, consent, and safeguards against misinterpreting communication differences as disengagement. Future work will evaluate the approach across multiple project milestones, examine how different trace types contribute to feedback quality and how students respond to iterative feedback, and explore whether it supports equitable teamwork experiences across diverse participation styles and support needs.

Conclusion

Project-based teamwork is central to computing education, yet collaboration processes often remain invisible while projects are underway. This design case study explored how routine traces of teamwork might support AI-assisted draft feedback for educator review. Findings suggest that routine traces can provide a practical basis for feedback perceived as relevant and actionable, while also highlighting the importance of trace coverage, student understanding of process-focused feedback, and educator mediation. Ultimately, making teamwork visible is less a technical challenge than a pedagogical one: designing opportunities for collaboration to be reflected upon and improved while it is still in progress. Seen in this way, routine traces are valuable not

because they capture teamwork perfectly, but because they create opportunities for meaningful feedback before collaboration problems become entrenched.

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The Future is Connection:

Collaboration, Creativity and Compassion in a Digital Society

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