APPENDIX

Table 1. Learner-Centered Feedback Framework adapted from Ryan et al. (2023).

Dimension	Component	Definition
Future Impact	Upcoming Similar Tasks	Feedback that provide concrete suggestions students can apply when completing comparable tasks in the future. *(e.g., "For your next report, consider adding subheadings to make the structure clearer.")*
	Meeting Learning Objective	Feedback that directs students toward fulfilling the stated learning outcomes of the unit or task. *(e.g., "Be sure to include model evaluation so that you address the outcome on assessing model performance.")*
		Feedback that promotes the development of transferable strategies, processes, or skills applicable across disciplines or contexts. *(e.g., "Outlining your ideas before writing will help you produce clearer work in future assignments.")*
Sensemaking	Strengths and Weaknesses	Feedback that highlights what was done well and what requires further improvement within specific aspects of the work. *(e.g., "Your discussion section is strong, but the analysis of data needs to be more detailed.")*
	Performance Summary	Feedback that provides an overall appraisal of the student's work in relation to the criteria or expectations. *(e.g., "This report satisfies most criteria but would benefit from deeper critical reflection.")*
Agency	Active Role	Feedback that encourages learners to engage actively with their development, such as by initiating discussion, revisiting feedback, or seeking further resources. *(e.g., "You can bring your draft to the next lab if you'd like more detailed feedback.")*
	Affirmation and Encouragement	Feedback that recognises effort or progress and motivates learners to continue building their skills. *(e.g., "You've improved your argument structure noticeably in this task.")*
	Student-Teacher Relationship	Feedback that demonstrates care and interest, reinforcing a positive and constructive relationship between teacher and student. *(e.g., "It's been great to see the growth in your reasoning throughout the semester.")*

Table 2. Coding Scheme for Tutor Revisions on ChatGPT-Enhanced Feedback (for RQ1)

Code	Subcode	Description	Example
1. Interaction	1.1. Edit	Modifying existing wording or phrasing in the feedback.	"You're a natural!" → "You're improving steadily."
	1.2. Remove	Deleting parts of the feedback.	"You'll go far in life!" → (removed)
	1.3. Add	Introducing new elements into the feedback.	(Added) "Try using subheadings to organize your discussion."
2. Tone	2.1. Praise	Expressing positive evaluation of the student's work.	**Edit:** "Fantastic work!" → "Good insight." **Remove:** "You're the best student I've seen!" → *(removed)* **Add:** (Added) "Nice effort on outlining the key points."
	2.2. Encouragement	Providing motivational comments to support the student's learning journey.	**Edit:** "You're a natural!" → "You're improving steadily." **Remove:** "You'll go far in life!" → *(removed)* **Add:** (Added) "Keep up the good work."
	2.3. Politeness	Framing the level of courtesy in the feedback to be more respectful.	**Edit:** "Fix this part." → "Please revise this section." **Remove:** "Thanks again!" → *(removed)* **Add:** (Added) "Thank you for your effort on this task."
3. Content	3.1. Elaboration	Supplying explanations by adding explanation, detail, or justification.	**Edit:** "Be clearer." → "Add an example in paragraph 2 to clarify your point." **Remove:** "Try harder next time." → *(removed — vague and unhelpful)* **Add:** (Added) "This is important because it supports your main argument."

	3.2. Correction	Concerning the accuracy of feedback content, including addressing information that is incorrect, unclear, or misleading.	**Edit**: "Your chart is wrong." → "The chart could be clearer if the axes were labeled." **Remove:** "Linear regression always works best." → (removed — misleading claim) **Add:** (Added) "Actually, a bar chart may be more appropriate here."
	3.3. Suggestion	Providing actionable advice or strategies for improving the student's work.	**Edit:** "Improve your structure." → "Use subheadings to organize your report more clearly." **Remove:** "Do better next time." → (removed — not actionable) **Add:** (Added) "You might consider starting with a summary before diving into details."
4. Brevity	4.1. Simplification	Avoiding using long or complex expressions to make the feedback clearer and easier to understand.	**Edit:** "It would be helpful if you could..." → "Consider..." **Remove:** "First of all, I think you should..." → "You should..." **Add:** (Added) "In short, be concise."

Table 3. Coding Scheme for the Interview Questions (for RQ2)

Code	Description	Example
1. Benefit		
1.1 Identifying Missing Content	Educators notice parts of learner-centered feedback they usually omit, identified through AI analysis.	I miss that part of affirmation and encouragement...I think that we still need to encourage them.
1.2 Promotes Reflection	AI tools help educators reflect on their feedback practices.	It helped me to reflect on my feedback. Whether I need some parts.
1.3 Improves Language and Structure	ChatGPT helps to improve phrasing, structure, and readability of feedback.	It feels a lot more structured compared to the original text...ChatGPT fleshed it out.
1.4 Saves Time	Mentions that AI tools can help save or manage time when giving feedback.	It's definitely going to reduce my time to develop and revise the feedback text.
2. Challenge		
2.1 Trust Issues	Educators express skepticism or conditional trust in the ML model's accuracy.	I'm just not 100% sure whether or not I'm comfortable trusting how it's analysed.
2.2 Inconsistent Tone	Concern about ChatGPT altering the educator's tone in feedback.	It turned me into someone saying, well done, Sonny Jim...I didn't use that tone.
2.3 Need for Human Editing	Educators emphasize the necessity to edit GPT-generated feedback.	One should always edit the stuff after ChatGPT has gone through.
2.4 Potential Misinformation	Concern that ChatGPT generates inaccurate or fabricated content.	But what we did see was it made something up...that is inexcusable.