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CU I&E Submission: AI-Augmented Personalized Feedback [1]

Category

Technology
Training/Education

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Project Description

This project implements an AI-augmented feedback workflow in a large-enrollment aerospace engineering computing course (ASEN 1030) to deliver personalized, formative feedback on student work at scale. Through an AI-driven pipeline that interfaces with the Canvas LMS, the system analyzes open-ended student responses (concept questions, lab reports, and code submissions) and generates feedback aligned with course learning objectives. Instructors and teaching assistants review and refine AI-generated drafts before releasing them to students, mitigating potential AI errors and ensuring accuracy and pedagogical alignment.
This human-in-the-loop approach transforms a feedback process that would otherwise be impractical due to the resource demands of full manual composition into rapid expert review. As a result, the course can provide timely, individualized feedback to approximately 100 students on a weekly basis. The system is actively deployed in course operations and supports both formative and summative assessment while maintaining instructional oversight.

Project Efficiency

The primary innovation is shifting feedback generation from manual writing to AI-assisted personalized feedback with human review. This enables graders to operate at the equivalent of high-speed composition (~80+ words per minute) while focusing their effort on quality control and refinement rather than writing from scratch.
As a result, the project can provide detailed, personalized feedback on open-ended responses at a scale that would otherwise require significantly more instructional resources. This improves both efficiency in terms of reduced grading time and enhances service by delivering

higher-quality, fully personalized feedback consistently for every student across assignments.

Project Inspiration

This project was inspired by a broader effort to make personalized, high-quality education scalable through AI (BOBPE: Bot-Based Personalized Education & Productivity Enhancement; additional context: www.bobpe.com [3]). A central challenge in teaching is that meaningful feedback is one of the most impactful learning tools, yet it is difficult to provide consistently in large courses without significant time and staffing resources.
Rather than using AI to automate grading, this project was designed to support understanding, reflection, and instructor-guided feedback. The goal was to create a system where AI enhances instructional capacity, improves feedback consistency, and preserves human judgment and pedagogical intent.

What Makes You Happiest about this Project?

It’s very rewarding to create a platform to give students in a large course meaningful, individualized feedback that would not have been feasible otherwise. Instead of canned comments or multiple-choice-only assessments, students receive explanations that address their specific reasoning, helping them understand not just what is incorrect, but why.
At the same time, instructors retain control over the feedback process, ensuring quality and alignment with course goals. Graders reported the workflow was efficient, and students appreciated receiving timely, personalized feedback. The system demonstrates that it is possible to scale high-quality personalized education without sacrificing rigor, consistency, or human oversight.

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