ASSESSING ARTIFICIAL INTELLIGENCE PROFICIENCY

Mathematics · Fall 2025-Spring 2026
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PROBLEM

The rapid rise of Artificial Intelligence (AI) in education and industry represents a fundamental shift in how we learn and work that will require students to be able to use AI tools effectively. A common theme at PCC's SoCo AI conference was that AI will not necessarily replace jobs, but rather that workers who know how to use AI will replace those who do not. However, instructors lack clear, objective ways to assess students' AI-supported problem-solving skills. This project sought to address that gap by developing a standardized rubric to assess how students use AI to independently solve problems—including the quality of their prompts, their creativity, and their ability to solve unfamiliar problems using AI as a tool.

PLAN

In Fall 2025, the first version of the AI Novel-Problem-Solving (AINPS) rubric was created using Microsoft Excel tasks as the assessment context. A lesson plan and assessment rubric were designed where students would:

1. Learn the fundamentals of using Microsoft Excel (e.g. inputting values and formulas)
2. Practice basic strategies for interacting with AI/LLMs via BoodleBox (e.g. prompt quality, iteration)
3. Solve novel Excel problems that they had not explicitly been taught how to complete, giving the student the opportunity to solve the problem independently

ASSESSMENT ACTIVITY

The AINPS rubric evaluates both the quality of students' AI prompts and whether they successfully completed the tasks. Students completed three Excel problems—splitting messy data using the "text to columns" feature, generating a line graph representing daily transactions sorted into categories, and counting duplicate values—submitting both their work and their AI prompts. Prompts were scored on:

1. Problem Framing & Quality: detail and clarity of prompt
2. Critical Evaluation of AI Output: discerning incorrect or inadequate AI guidance
3. Strategy & Iteration Skills: use of follow-up questions for explanation or analysis
4. Integration for a Solution to the Problem: efficiency of use, successful task completion
5. Ethical Use of AI & Measure of Learning: acknowledging use of AI as a tool to facilitate rather than replace learning

RESULTS AND DATA

Of the 25 participating students across two classes, 92% completed at least one task successfully and 72% completed all three independently. Students also demonstrated increasingly sophisticated prompting as the activity progressed, suggesting that structured instruction plus the rubric improved their use of AI for problem-solving.

CLOSING THE LOOP and NEXT STEPS

The initial rubric proved effective, but several refinements are planned. Students need explicit instruction on the rubric itself so they can distinguish between vague and high-quality prompts that make progress on solving the problem because they are sophisticated, focused, and detailed. Future assessments will compare student prompts before and after training to measure growth. Additional improvements will focus on helping students recognize that AI output depends heavily on prompt quality, and that they may include incorrect guidance. These changes are planned for Spring 2026 implementation.

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