

Is AI Good or Bad for Preparing Engineers? A Utah State Professor Gets NSF Funding to Find Out

07/22/2026

Artificial intelligence is rapidly transforming how undergraduate students learn and make decisions in educational and professional settings. However, if AI is relied on too heavily, it can impede students' ability to navigate problems on their own and improve their knowledge.



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Utah State University professor Oenardi Lawanto received a \$618,387 grant from the National Science Foundation to study if AI tools strengthen or weaken engineering students' problem-solving skills.

"We cannot avoid AI, it's here," said Lawanto. "People and industry use it, so we ought to find a way for students to use it to improve their learning."

Lawanto said a lot of universities are creating AI policies, but they're not based on research. The results of this Utah State study will serve as a data-backed blueprint on how educators, curriculum developers and policy makers can integrate AI into education to prepare engineers to work with it effectively and responsibly.

Over the course of three years, researchers will use an AI-embedded tool on Canvas to explore how undergraduate engineering students learn to balance their own judgement with AI assistance, how they develop trust in AI tools, when to rely on or challenge AI-generated outputs and if they maintain ownership during AI-supported problem-solving.

To study these objectives, 100–150 engineering students in their sophomore and senior year of undergraduate studies will complete the revised Physics Metacognition Inventory, a survey to understand their thought process when they're problem solving. Students will also take an open-ended survey in their sophomore, junior and senior year for researchers to observe patterns in their self-regulation around AI when they're solving engineering problems.

At the end of the project, a small subsample of students will be interviewed to understand how their perceptions, decision-making processes and self-regulation have changed during the three-year study. Researchers will analyze the data to develop a model to explain how students' use of AI evolved over time.

"We don't know if it will have a negative or positive impact," said Lawanto. "If we find that it's mostly negative, the next question is how do we change that?"

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