

ITLS Professor Awarded \$3.5M NSF Grant to Build STEM Career Awareness in Rural Mountain Communities in Collaborative Project

02/06/2026



A middle school student in rural Colorado designs a programmable sensor as part of the STEM Career Connections project.

A new research initiative led in part by a professor at Utah State University aims to reshape how rural middle and high school students prepare for careers in science, technology, engineering, and mathematics (STEM).

Mimi Recker, Ph.D., professor in the Department of Instructional Technology and Learning Sciences at USU and recent inductee as a fellow in the International Society of the Learning Sciences, is one of three principal investigators on a collaborative project recently awarded a combined \$3.5 million, five-year grant from the National Science Foundation (NSF). The team's goal is to increase STEM career awareness among middle and high school students in rural, tourism-oriented communities.

Recker is joined by collaborators from the University of Colorado Boulder and the University Corporation for Atmospheric Research, a Boulder-based research organization. Funding for the work comes through the NSF's Innovative Technology Experiences for Students and Teachers program, which supports projects designed to increase students' knowledge of and interest in STEM careers.

"As a Carnegie Community Engagement Institution, Dr. Recker's work embodies USU's efforts to meaningfully collaborate with students, teachers, and small business owners," said Andy Walker, department head of ITLS. "I'm excited to see this project scale and move towards sustainability. The time to show the value of STEM, higher education, and iconic science institutions like UCAR through the voices and experiences of main street employers, school district educators, and middle and high school students is now."

The new grant builds on an earlier NSF-funded proof-of-concept project the researchers conducted in a single rural Colorado school district. That initial effort, known as STEM Career Connections, demonstrated that community partnerships that connect schools, local businesses, and mentors could expand student understanding of STEM careers. The newly funded project will now scale the original work into three rural school districts in Colorado.

"These are communities with a lot of complexity," Recker explained. "They're often tourism-based, which creates big income disparities. Housing is expensive, many vacation homes sit empty much of the year, and families who work locally often struggle to find affordable housing. Those challenges affect students in profound ways."

School districts also face barriers that can limit student access to STEM learning opportunities. Rural communities may lack access to STEM resources such as internet access or bandwidth. At the same time, teacher training and retention gaps in STEM areas and access to resources limit what opportunities schools can offer to students. As a result, students in these communities are frequently disconnected from pathways into STEM careers.

"We're trying to help students see that STEM is everywhere, and that there are workforce pathways that offer lots of opportunities, including in rural areas," said Recker. "If you're involved in wildfire mitigation or forest management, you may be working with geographic information systems. If you work for the county doing wastewater management, you may be doing lots of work with programmable sensors."

The project is designed to address these gaps by creating instructional pathways for middle and high school students that emphasize technology design, computer programming, sensor systems, and artificial intelligence.

One of the defining features of the project is its emphasis on community partnership. Instructional units taught to students will be co-designed by teachers, researchers,

and local business and nonprofit leaders to reflect the STEM applications present in each community. These units will align with national standards and be integrated into existing coursework.

“This isn’t about researchers coming in with a one-size-fits-all solution,” Recker said. “We start by bringing educators and business leaders together to talk about what STEM opportunities exist locally, what challenges students face, and where the gaps are. Then we problem-solve together.”

Through the partnerships, students will be exposed to STEM careers through mentoring, field trips, and internships. At the middle school level, mentors may visit classrooms or host students at local workplaces. As students progress into the later years of high school, those experiences will expand into internships.

The project is designed to benefit both the students and the local communities. Many rural areas struggle to retain young people, who often leave after graduation due to limited job opportunities or the high cost of living.

“In a lot of these communities, businesses are eager to invest in a future workforce,” Recker said. “This creates a way for students to see a future for themselves locally, while also helping businesses and nonprofits tap into a future workforce.”

Over the five-year project, researchers will examine how student skills, engagement, and aspirations change after participating in the program. Data collection will include classroom observations, student and teacher interviews, surveys, assessments, and analysis of student-created work. The project will also fund local coordinators in each community to support data collection and strengthen ties between schools and partners.

Key research questions will focus on what students learn, how effectively they can apply STEM skills to real-world problems, and whether participation influences their interest in pursuing STEM-related careers. Researchers will also examine how working with local partners contributes to the success of the model and how it might be adapted for other rural communities. At USU, graduate research assistant Indu Garg will help with project research and evaluation activities.

“We’re not assuming STEM is for everyone,” Recker said. “But for students who might never have considered it, we want to know if they begin to see a place for themselves—if they feel like they belong.”

Another major goal is sustainability. Too often, Recker noted, research projects fade once grant funding ends. In the later years of the project, the team will focus on identifying strategies and resources that will help the community partnership continue beyond the life of the grant.

“If this is going to matter long term, it has to be locally driven,” Recker said. “The value is the impact it will have on the kids and the community, and we need to demonstrate that clearly.”

“Our overarching goal is for students to develop a genuine sense of belonging in STEM,” Recker said. “

We want them to feel like they’re not an outsider, but that they will find a welcoming environment for both learning and working. And that, in fact, locally, there are lots of opportunities to enter the workforce around STEM.”