



## **Expanding and Strengthening the STEM Teacher Workforce Through UTeach**



**UTeach**  
Institute

Supporting Effective Educator  
Development (SEED)  
Project Outcomes & Impact  
Report, U.S Department of  
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## Project Overview

Over the course of five years (2018–2023), this UTeach initiative — supported by the Department of Education’s *Supporting Effective Educator Development (SEED)* program — advanced its mission to increase the number, diversity, and academic achievement of students pursuing STEM disciplines and careers by developing STEM teachers who stay in teaching and engage diverse groups of students in meaningful learning in STEM disciplines. This project achieved two primary goals:

- Increased the number of highly qualified STEM teachers in high-need schools through the strategic expansion of UTeach secondary STEM preparation pathways.
- Increased the number of computer science teachers who can broaden participation of underrepresented students in computer science in high-need schools through evidence-based professional development of in-service teachers.

The project brought together well-established UTeach programs from four universities: Louisiana State University (LSU), The University of Houston (UH), The University of North Texas (UNT), and The University of Texas at Austin (UT). The UTeach Institute collaborated with these partners to build on the UTeach program model to develop and implement seven innovative, alternative pathways to prepare new STEM teachers, including an emphasis on preparing certified computer science teachers. At the same time that new approaches to pre-service STEM teacher preparation were being developed, in-service teachers were engaged in professional development to broaden participation in computer science and bolster belonging in STEM.

Partners also included the American Institutes for Research, which provided program evaluation and conducted two research studies of high school computer science course implementation and teacher professional development. Digital Promise provided support and hosted the computer science micro-credentials on their platform.

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**The project successfully adapted and expanded on UTeach recruitment and training strategies in response to the disruptive COVID-19 pandemic, resulting in more flexible and inclusive approaches to STEM teacher preparation that effectively served a wider range of pre-service candidates. This project also enhanced the skills of in-service STEM teachers who implemented project-based, student-centered computer science coursework and research-based instructional strategies to develop belonging in STEM.**

**This project led to important innovations in pre-service and in-service STEM teacher development at a critical time in U.S. education. In this way, the national network of university-based UTeach programs, with support from the UTeach Institute at The University of Texas at Austin, continues its work to strengthen STEM teacher development so that all students are well prepared for current and future STEM workforce opportunities.**

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# Key Outcomes — Pre-Service STEM Teacher Preparation

## Pathways Developed

Seven innovative alternative pathways were created across four universities (LSU, UNT, UT, UH) to prepare new STEM teachers, including certified computer science teachers.

## Program Completion

178 candidates completed these programs. Of these, 65 were qualified to teach computer science. 78 degree-holders entered programs with undergraduate degrees and were post-baccalaureates or master's degree-seeking students. These participants were career changers whose backgrounds ranged from experiences in the U.S. Air Force, STEM industry, and field science.

## Diversity

The program produced a diverse group of program completers, including 96 women, 81 men, and 1 non-binary individual.

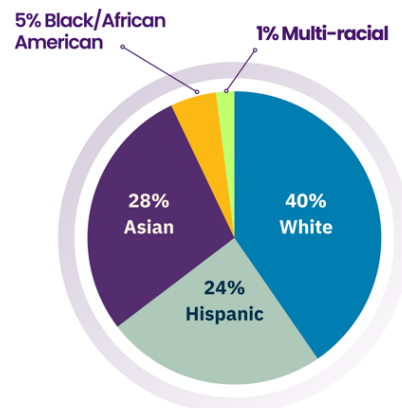
Racial/ethnic diversity included 40% White, 24% Hispanic, 28% Asian, 5% Black/African American, 1% multi-racial, and 2% not reported.

## Retention and Employment

89% of graduates entered the teaching profession, with 91% retained as of Fall 2023. Graduates are teaching a variety of STEM subjects, including mathematics, biology, chemistry, physics, computer science, and earth and space science.



Enrollment and Completion



Diversity of Completers

# Key Outcomes — In-Service STEM Teachers Served

## Computer Science Teacher Development

- **Computer Science Training:** 371 in-service high school teachers were trained to implement UTeach CS curriculum (UTeach CS Principles and UTeach CSA) across 39 states and the District of Columbia and Guam.
  - Students using UTeach CS curriculum outperformed the national average on both the AP CS Principles and AP CSA exams.
  - 95% of teachers agreed that UTeach CS had a positive impact on student learning.
  - 90% of teachers agreed that UTeach CS helped them become a better CS teacher.
  - 90% of teachers agreed that their students became more interested in CS while taking a UTeach CS course.
- **Computer Science Micro-Credentials:** 113 K–12 teachers from 13 states earned computer science micro-credentials.

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"I've used several different curriculum packages to teach AP CSP and AP CSA and by far, the UTeach CS curriculum is easiest on the teacher and really enjoyable for students. The professional development is exceptional. The lesson plans are well thought out, supportive, and artfully crafted to build upon each other. I highly recommend UTeach CS if you're looking for a better way to teach CSP and CSA!"

– High school computer science teacher, Illinois

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## STEM Teacher Development

- **Cultivating STEM Belonging:** 127 in-service science and math teachers received summer training in research-based methodologies in STEM teaching, with 97 teaching in high-need schools across 11 states. 100% reported high levels of satisfaction in this professional development.

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"This was a very valuable experience. UTeach materials are always super relevant and applicable to my teaching, and I am free to speak about real issues and receive realistic feedback from peers and Master Teachers."

– High school science teacher, Texas

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# Project Impact — Pre-Service Teacher Development

## Enhanced Recruitment and Support

- The project developed and published a guide called *Recruiting and Preparing More STEM Teachers: University-Based Solutions* and hosted a two-day summit in Austin, Texas with 102 attendees on recruiting and attracting a more diverse group of pre-service candidates to STEM teaching.
- The project found that financial incentives were crucial in retaining students in their university STEM teacher preparation programs, with 68% of program graduates citing financial support as a key factor.

## Enthusiasm for Teaching

- 133 responses were collected from the End-of-Program student feedback surveys (response rates ranged from 73% to 100%), administered to the four partner programs over the life of the project.
- New teachers reported feeling well prepared to implement multiple teaching strategies, including inquiry-based instruction.
- 92% reported overall high satisfaction with their preparation to teach.
- 76% reported an interest in teaching in high-need or economically disadvantaged schools.

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“I feel quite prepared to teach. ... I am passionate about equal opportunities in the classroom, and this program connected deeply with that interest, which is what drove me toward teaching in the first place.”

– UTeach program graduate

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## Project Impact — In-Service Teacher Effectiveness Studies

Two major studies by the American Institutes for Research evaluated the effectiveness of UTeach Computer Science professional development programs. These studies provided valuable insights for refining curriculum and teacher support:

- **Improved Teacher Preparedness:** The initial study found that UTeach’s AP CS Principles professional development improved teacher readiness to implement the curriculum.
- **Increased Teacher Knowledge:** The second study showed that UTeach AP CSA professional development increased teacher knowledge and culturally responsive practices.
- **Ongoing Refinement:** Insights from both studies were used to refine UTeach’s CS curriculum and PD offerings to better support teachers and promote access and equity for all students.

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