

Change agents: Education specialists a growing force at CSU campuses

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Lead study author Kathy Williams with SDSU. Credit: San Diego State University

There is so much emphasis placed on STEM skills and boosting students' understanding and interest in these fields. But are school teachers and

college faculty able to engage their students and deliver teaching in a way that makes it hands-on and gives them the ability to tackle and solve real-life problems?

This is where [science](#) faculty with education specialties (SFES) come in, with the unique ability to help their colleagues and K-12 teachers improve [science education](#) in the classroom. Their purpose is threefold: conduct research on how students learn science, improve [teacher training](#) and recruitment so they are better equipped to empower their students with science skills, and help [college](#) science faculty improve curricula and become even better educators.

SFES are growing in number across California State University (CSU) campuses, and university administrators recognize their value and the impact they're making.

"With SFES as change agents, we are able to produce students who can reason better, solve problems we can't even imagine exist today, and transfer their understanding of science to everyday problems," said Kathy Williams, professor emerita of biology at San Diego State University and a faculty member of SDSU's Center for Research in Mathematics and Science Education (CRMSE).

In a follow-up to a 2007 study Williams looked at how the role of SFES has evolved across all 23 CSU campuses, the impact they're making, and how college administrators perceive them. Williams, along with co-authors from Cal Poly San Luis Obispo, San Francisco State University, and Utah Valley University, spoke with college deans and surveyed SFES at every CSU campus.

Published today in *Science Advances*, the online journal of the American Association for the Advancement of Science (AAAS), this is a replicated study with bonus questions that confirmed that SFES were

indeed change agents, and college deans saw them as valuable members of their departments who improve learning and conduct key research.

"In K-12 training, they're preparing future teachers to understand science better so they enter their classrooms ready to help and challenge their students to apply science on a daily basis," Williams said. "They're helping create non-traditional classrooms where students solve problems in real time."

In both K-12 and [undergraduate education](#), as class sizes balloon, SFES are developing ways to ensure quality of education remains high. At SDSU, CRMSE is a collaboration of researchers that looks at how people learn science from K-12 through college.

"Programs like CRMSE have produced outstanding SFES who are now change agents at their institutions and nationally," Williams said. "Our science faculty are very committed to undergraduate and graduate education, but because of their focus on their own research, they may not always be able to keep up with the latest research on how students learn, and that's where the SFES can help by sharing resources."

Today, there are more than 150 SFES across the CSU campuses. The study had 89 respondents who completed the self-assessment survey. The authors also interviewed 24 deans.

"Their numbers are still small, which is one of the challenges for SFES," Williams said. "Some campuses have done cluster hires across several science departments and that has been successful. Colleges around the world are now replicating what we are doing here within the CSUs, because stakeholders are really interested in the difference they make."

More information: S.D. Bush at California State Polytechnic University in San Luis Obispo, CA et al., "Evolving roles of scientists as

change agents in science education over a decade: SFES roles beyond discipline-based education research," *Science Advances* (2019). DOI: 10.1126/sciadv.aav6403 , advances.sciencemag.org/content/5/6/eaav6403

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