

# When scientists take on science education

December 18 2008

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A greater commitment by science faculty to focus on science education could drive education reform at universities and K-12 schools, according to a new report by a team of five researchers from the California State University (CSU) system and one from Purdue University.

Appearing in today's issue of the journal *Science*, the report evaluates the role that science professors who specialize in science education play in improving how the sciences are taught.

To illustrate the pressure universities are under to cultivate an effective learning environment, the report cites an earlier study indicating that when college students abandon science as a major, 90 percent of them do so because of what they perceive as poor teaching; and, among those who remain in the sciences, 74 percent lament the poor quality of teaching.

"Ultimately, we need data on science faculty who focus particularly on science education to learn how colleges and universities can make science accessible to everyone," said James Rudd, corresponding author and assistant professor of chemistry and biochemistry at California State University, Los Angeles.

In addition to Rudd, the study's co-authors are Seth D. Bush, assistant professor of chemistry and biochemistry at Cal Poly San Luis Obispo; Nancy J. Pelaez, associate professor of biological sciences at Purdue University and formerly with CSU, Fullerton; Michael T. Stevens, assistant professor of biological sciences at CSU, Stanislaus; Kimberly

D. Tanner, assistant professor of biology at San Francisco State University; and Kathy S. Williams, associate professor of biology at San Diego State University.

The CSU research team studied science faculty who take on specialized roles in their disciplines to reform undergraduate science education, improve K-12 teacher education and preparation and conduct science education research. These "science faculty with education specialties," or SFES, come from various backgrounds.

In a comprehensive survey of the CSU campuses, 59 science faculty were identified as serving in the SFES role. Of those, 47 percent transitioned into the role from a more traditional science-faculty position, with many of them continuing their efforts in basic science research. The remaining 53 percent were hired specifically for the SFES position, and they tended to focus more on science education efforts.

Roughly 40 percent of both types of SFES surveyed noted serious consideration toward leaving the specialized science-education position due to a perceived lack of institutional understanding of the field and to job burnout.

The authors will next expand the CSU study to a national sample.

The success of SFES positions, the research team believes, can be measured by increased numbers and quality of K-12 science teachers and of science majors graduating from colleges and universities; and such increases will need greater collaboration between universities and K-12 education districts, within universities between colleges of science and colleges of education, and internally within science departments.

"The quality of undergraduate and K-12 science education depends on strengthening these collaborations with additional funding and published

research on science education," said Rudd.

The CSU is the largest U.S. university system, with an annual enrollment of approximately 450,000 students spread among its 23 campuses – which differ substantially in their history, settings, student populations, enrollment sizes, and level of research orientation.

Source: San Francisco State University

Citation: When scientists take on science education (2008, December 18) retrieved 25 April 2024 from <https://phys.org/news/2008-12-scientists-science.html>

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