

Involving Scientists in K-12 Science Education: Benefits to Scientists from Participating in Scientist-Teacher Partnerships

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Over the past decade, collaborations between members of the scientific community and K-12 educators are increasingly seen as a key mechanism of science education reform in the United States. These scientist-teacher partnerships can occur in the context of research laboratories, K-12 classrooms, and professional development settings. The potential benefits for the K-12 system are enormous, including scientist role models for students, increased knowledge of scientific concepts and inquiry for teachers, and the integration of scientific inquiry experiences into K-12 science teaching and learning. But what, if anything, do university scientists themselves learn from collaborating with teachers and students?

This study examines the impact of scientist-teacher partnerships on university scientists participating in partnership programs at two universities: 1) the UCSF Science and Health Education Partnership (SEP), a longstanding institutional partnership at the University of California, San Francisco (UCSF), and 2) the GK-12 Partnership Program, a recently founded program at San Francisco State University (SFSU). Both partnership programs engage teachers from the San Francisco Unified School District (SFUSD), a large, urban school district with a strong commitment to improving student achievement. Preliminary interview data collected from 34 scientists guided the further collection of written response data from over 40 additional scientists. This written data set was analyzed to identify common learning outcomes reported by scientists and to determine the prevalence of each outcome among the cohort.

Analysis of data from participating scientists suggests that scientists benefit from their partnership experiences with teachers and students in a variety of ways that have profound effects on them both professionally and personally. The benefits that scientists accrue from partnership fall into three broad categories: 1) benefits as scientific professionals, 2) benefits as future educators, and 3) benefits as individuals. More specifically, scientists report that as a result of their partnership they interact with colleagues in new ways, reflect on their understanding of or renew their enthusiasm for sci-

ence, and explore new career paths. In addition, participation in partnerships also affects scientists' attitudes toward teaching and education. Through working in partnerships, scientists develop the ability to explain science simply, explore inquiry-based teaching strategies, and reconsider their own teaching philosophy. Finally, partnerships also affect scientists personally; they gain personal satisfaction, establish connections to the community, and in some cases increase their general confidence and self-esteem. Post-hoc quantitation of these sub-categories demonstrated that each scientist benefited in multiple ways and that emerging outcomes were robust across multiple scientists.

While it has been previously suggested that scientists may benefit from partnerships, this is one of the first studies to explore this issue in depth with a large cohort of scientists. These data suggest that scientist involvement in K-12 partnerships has the potential to drive reform of university science teaching, since many scientists who teach in undergraduate and graduate settings and do so with little or no formal pedagogical training, as well as provide a promising approach in promoting coherent articulation of K-18+ science teaching and learning experiences for students. [Funded by the National Science Foundation, NSF# DGE-0136879]