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Discovering the Biology Education Research Community

SUSAN MUSANTE

When Sarah Eddy began work on her doctoral thesis, she assumed that her main contribution would relate to her field of study—behavioral ecology and the sexual selection of salamanders—but one of her more significant discoveries had nothing to do with amphibians and everything to do with what was going on in the classroom. As a graduate teaching assistant at Oregon State University, she realized how important it was to her to see students truly improve their learning. “It was in trying to figure out how to help students achieve more that I discovered education research literature,” she explained. Many biologists in all phases of their careers have made similar discoveries, and they will benefit from the growing biology education research (BER) community.

In May 2012, the BER community gained new insights when the National Research Council published “Discipline-Based Education Research: Understanding and Improving Learning in Undergraduate Science and Engineering.” The National Science Foundation (NSF) commissioned the report and charged the authoring committee with providing a synthesis and analysis of discipline-based education research (DBER). The report provides an overview of the field, compares the history and current scope of DBER’s subdisciplines (biology, chemistry, geology, physics, and engineering), and makes recommendations for future directions. DBER is conducted by those with expert knowledge of one of the sciences, and rigorous research methods are used to generate a body of evidence about effective ways to teach students about science, explained Susan R. Singer, chair of the authoring committee and professor of biology and cognitive science at Carleton College.

The growing BER community is adding to that collective knowledge. Until recently, isolated groups interested in BER interacted at various professional society meetings but did not have a central community of their own. That all changed in 2010, when a trio of biology educators—Mary Pat Wenderoth, principal lecturer at the University of Washington’s biology department; Clarissa Dirks, associate professor of biology at The Evergreen State College; and Teresa Balsler, dean and professor at the University of Florida—received an NSF incubator grant to host a pilot meeting to bring the BER community together. During that meeting, participants discussed the major research questions, challenges facing the field, and ways to best support the growing community. The outcome of that meeting was the formation of the Society for the Advancement of Biology Education Research (SABER).

Two SABER meetings have taken place annually since that initial gathering, and because of great interest, another is planned for 2013. “There were many new faces at each of the meetings,” says Dirks. She was especially excited to see the large number of postdoctoral fellows and graduate students who actively participated and provided information about how SABER could meet their needs. The DBER report’s authoring committee commissioned Dirks to write a paper in which she analyzed the past 20 years of biology education research. She found that there has been an increase in publications in recent years. “Most of the papers were from the last decade,” said Dirks about the emerging field.

“The science of biology has changed more radically than any other discipline in recent years,” said Balsler. “It’s clear that we can’t keep trying to teach everything that is known to the field; we’ve reached a tipping point.”

Balsler, a soil microbiologist, discovered BER after becoming disillusioned with the ineffectiveness of traditional teaching methods. She is now helping foster changes in the way biology is taught both on her own campus, as dean of the College of Agricultural and Life Sciences, and nationally, through SABER and other initiatives. Balsler encourages instructors who want to dive into biology education research to join SABER. “It provides a community and a vehicle for those who want to move to the next level,” she explained. SABER is a home for those who want to contribute to the body of evidence-based, data-driven research that will help all instructors who want to teach biology the way the science is practiced.

Now a postdoctoral research associate in the biology department at the University of Washington, Eddy has joined the growing SABER community. The discovery that she made in graduate school transformed her career path from one solely focused on science research to one that allows her to combine her knowledge of biology and education research and apply it to significant questions about biology teaching and learning. She believes that the results coming from the BER community can benefit all biology instructors and can help them to apply evidence-based practices in the classroom. Only then can biology instructors be confident that their students are actually engaged. “We can’t assume [that] they are learning,” said Dirks, “we need to reach a broad audience and not turn students off to science.”

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