
Creative Approaches to Faculty Development

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Faculty development is the key to successful dissemination of effective teaching and methods and educational materials. The need for such faculty development is a result of the fact that the majority of STEM faculty received no training to meet the demands of students' diverse learning styles. Most have adopted the lecture and supporting demonstration-style labs through which they learned their disciplines.

Now that so much has been learned about teaching and learning and so many effective strategies and materials have been developed and tested, it is critical that this knowledge and an accompanying pedagogical skill set be passed along to higher education faculty.

Effective faculty development requires an understanding of the most effective means of engaging faculty in the pursuit of better teaching and providing them with evidence that these innovative strategies are effective and worth the effort. A set of best practices for training faculty and supporting them in their own classrooms must also be developed and implemented.

The following chapters describe the efforts of several DUE-funded projects to design and carry out dissemination programs. Haynes et al. have a 25-year history of DUE-funded curriculum development and successful faculty enhancement centered on environmental problem-solving. In their early dissemination work, funded by the DUE Undergraduate Faculty Enhancement (UFE) program, over 100 faculty participated in workshops, and over 90% of those faculty designed and implemented new curricula at their home institutions. Their more recent dissemination work, funded by the CCLI National Dissemination track, is also described, along with the preliminary results of the evaluation of the project.

Macdonald et al. discuss their set of integrated, web-supported professional development opportunities for geoscience

faculty. Their program includes six multi-day workshops, as well as a number of sessions and workshops presented at professional meetings each year. Evaluation has demonstrated that their "Cutting Edge" project is effectively changing the way participants teach geosciences.

Atman et al. describe the Center for Advancement of Engineering Education (CAEE). Funded by the NSF Centers for Learning and Teaching program, CAEE is working to enhance engineering students' learning experiences, to strengthen the engineering education research base, and to build leadership capacity in engineering education through collaboration across several institutions.

Laws relates a brief history of the development of the Activity-Based Physics Suite. She further explains the way in which assessment of early dissemination efforts, partially funded by the DUE-UFE program, provided feedback that prompted needed revisions in the first-generation curricular materials and led to the development of the full suite described in detail in this chapter.

The final chapter in this section considers a different aspect of faculty development—the university role in promoting successful grantsmanship. Andersen and Marinez discuss the need for a community of faculty and administrators to provide faculty with time, support, and recognition for their grant-writing activities.

The successful faculty development projects described here are among a growing number of DUE-funded dissemination projects. As these projects mature and evolve in response to their formative assessments, the community will continue to learn the most effective methods for fostering faculty interest in teaching and learning and for supporting those faculty as they institute innovative curricula in their own classes.