MAR14-2013-020468

Abstract for an Invited Paper
for the MAR14 Meeting of
the American Physical Society

Results from a model of course-based undergraduate research in the first- and second-year chemistry curriculum[1]

GABRIELA WEAVER, Purdue University

The Center for Authentic Science Practice in Education (CASPiE) is a project funded by the URC program of the NSF Chemistry Division. The purpose of CASPiE was to provide students in first and second year laboratory courses with authentic research experiences as a gateway to more traditional forms of undergraduate research. Each research experience is a 6- to 8-week laboratory project based on and contributing to the research work of the experiment's author through data or preparation of samples. The CASPiE program has resulted in a model for engaging students in undergraduate research early in their college careers. To date, CASPiE has provided that experience to over 6000 students at 17 different institutions. Evaluation data collected has included student surveys, interviews and longitudinal analysis of performance. We have found that students' perceptions of their understanding of the material and the discipline increase over the course of the semester, whereas they are seen to decrease in the control courses. Students demonstrate a greater ability to explain the meaning and purpose of their experimental procedures and results and provide extensions to the experimental design, compared not only to control courses but also compared to inquiry-based courses. Longitudinal analysis of grades indicates a possible benefit to performance in courses related to the discipline two and three years later. A similar implementation in biology courses has demonstrated an increase in critical thinking scores.

[1]Work supported by the National Science Foundation, Division of Chemistry.