MAR16-2015-006327

Abstract for an Invited Paper
for the MAR16 Meeting of
the American Physical Society

Student-Driven Engagement: An Interdisciplinary-Team Research-Learning Renewable Energy Laboratory Experience for Undergraduates

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How does engagement and deep learning happen? Every science department seeks to cultivate an excellent level of scientific skills and knowledge in its undergraduate students. Yet, this is not sufficient to thrive as a professional. Engaging directly in real-world challenges can foster a professional attitude: a high level of self-efficacy, a genuine sense of relevance, and proactivity. This talk will describe pedagogical developments of a junior-year renewable energy laboratory course at the University of Massachusetts Amherst that is part of a four-year Integrated Concentration in Science (iCons) program. Over the four years, the interdisciplinary iCons students–from 24 various majors–work through case studies, selection and analysis of real-world problems, inception and development of potential solutions, integrative communication, experimental practice, and capstone research. The team dynamic is a central aspect of the experience, yielding significant educational and developmental benefits. The third-year energy course uses adopts a culture of a small vibrant R and D company (I3E – "Energy, Powered By Intelligence"), in which every person in the course has a vital responsibility and creative resourcefulness must be employed in the project work. The course emphasizes the practice of using reflection and redesign, as a means of generating better solutions and embedding the practice of learning in a real-world context. This work is supported in part by NSF grant DUE-1140805.