Using Service-Learning to Prepare Engineers for a Trans-Discipline World

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Reform in engineering education has been driven by many issues. Industry's call for a better-rounded graduate who is better equipped today's fast moving, global economy motivated the redefining accreditation criteria that place professional skills, such as teamwork, communication and awareness of social issues, into core engineering curricula. Curricula are being stretched to stay current and relevant as disciplinary boundaries are blurred with emerging technology. The continued underrepresenation of women worldwide and minorities in many countries has fueled innovative curricular models that integrate active learning with relevant engineering applications. A decline in interest among pre-college students in engineering in many countries prompted the development of K-12 outreach programs and high school engineering courses. At the same time, many other disciplines have undergone reform through service-learning, which integrates community service with academic courses to both enhance learning and provide services to underserved populations in a community. Research has shown that service-learning can enhance classroom learning, is consistent with theories for increasing retention and the community context and social relevance is consistent with the characteristics advocated to increase participation of underrepresented populations in engineering, especially women. Placing engineering within a local community context broadens the view of engineering for most students and therefore has the potential attract a wider pool of students to the field.

One successful model in engineering-works with the local community. The Engineering Projects in Community Service (EPICS) Program at Purdue University. (http://epics.ecn.purdue.edu/) and 18 other universities (http://epicsnational.ecn.purdue.edu/).

A second successful model integrates projects from other countries, typically the developing world. Engineers Without Borders in the USA http://www.ewb.usa) or in Australia (http://www.ewb-aus.org.au/) and around the world

Despite the numerous benefits and the successful models, engineering continues to lag behind many other disciplines in embracing service-learning.

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