Abstract

In Fall 2004, a service-learning curriculum was introduced in one section of Engineering 100: Introduction to Engineering, at the University of Michigan. The incentive for this change was to develop a first year option for students that directly addressed the role of the engineer in society and appealed to students with altruistic goals who often leave engineering for other majors. The goals of this project was to explore the impact that service-learning might have on students’ learning, including their level of engagement and motivation, in a required first year course.

Methods

One method for assessing student learning is the anonymous semester-end instructor evaluation questionnaire required for all courses at the University of Michigan. Students’ responses to these questions provide insight into their perceptions of the quality of the course and instructor, the extent to which they “learned” in the course, and their desire to enroll in the course, as well as specific teaching outcomes for the course.

To determine if the integration of a service-learning curriculum into Engineering 100 affected the student’s learning in the course, a detailed statistical analysis of the teaching evaluation responses was performed. These analyses included a Stepwise Regression analysis, Multiple Regression analysis, Correlation analysis, and a Multifactor ANOVA test performed on the evaluations for four successive semesters of ENG 100 taught by the same instructor; the first three without and the last with a service-learning section.

A Forward Selection Stepwise Regression analysis for Q1 and Q3 revealed that students perceptions of the quality of the course were better predicted by a model which included a sense of pride and accomplishment, and recognition of an impact on society. Whereas, in previous semesters, the predictive model included questions related to technical communication skills and technical knowledge.

Results

Compared to the incoming class as well as other sections of E100, the service-learning section hosts a higher percentage of under-represented minority students. Both the service-learning and bio-medically themed sections appeal to female engineering students.

In a comparison of instructor evaluation median values before and after the introduction of a service-learning curriculum, it is apparent that students who experienced the service-learning section held a more positive perception of the quality of the course and instructor, and the amount of learning. The students also displayed a much stronger desire to enroll in the service-learning course.

Conclusions

The overall response of students during the service-learning semester indicated a higher sense of satisfaction with the course and instructor. Students deliberately elected this section of the course. The course served a population with more altruistic goals, thus hosting a larger population of women and under-represented minorities than the first year program population.

During the service-learning semester, student perceptions of the quality of the class could be best predicted by a model which included responses to questions related to the service-learning curricular goals.

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