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.

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 curriculum.

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.

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.

Overall, the implementation of a service-learning curriculum in this course offered a unique opportunity for students to partake in a project relevant to their professional and educational goals. Providing these opportunities is an excellent method for increasing the relevance of engineering curriculum to under-represented students, thus improving the diversity of the field. In addition, students enrolled in the course had an increased perception of their understanding of social and economic considerations in engineering, a sense of pride and accomplishment as a result of completing the project, and a recognized commitment to thinking more carefully about engineering’s impact on society.

The authors wish to acknowledge Ms. Pauline Khan, Dr. Levi Thompson, Dr. Gary Herrin Dr. Toby Teory, Dr. Alba Rueda-Riedle Dr. Cynthia J. Finelli, Dr. Cinda-Sue G. Davis and the Michigan Undergraduate Research Opportunity Program.