



OBJECTIVES



This project developed, tested, and distributed a new survey instrument to collect, analyze and disseminate quantitative and qualitative data on out-of-class involvement, affective engagement and learning outcomes that can be leveraged to guide institutional policies and programs and to design effective innovations to promote diversity, enhance persistence, and increase professional skills of engineering students that progress into the workforce.

The project developed and validated the Postsecondary Student Engagement Survey (PosSES) survey. Demographic data including gender, race/ethnicity, age, self-reported household income, citizenship status, veteran status, disability, first-generation and continuing-generation college, LGBTQ+. Profile of students' participation was measured by 20 types of OOCAs across 4 levels of participation. The survey examined the 30 types of learning outcomes, 14 positive reasons, and 16 negative reasons that related to each OOCAs student participating. Engagement was measured according to the influence of peers and faculty, motivation, satisfaction, and belonging in a learning setting. Six factors model including Major Satisfaction, Academic Discipline Belonging, Major Valuing, Achievement Striving, Peer Interaction, and Positive Faculty Relationship was constructed and validated to measure the affective engagement of engineering students.

SURVEY DEVELOPMENT

- Demographic data
- 20 types activities
- 4 levels of participation
- 6 affective engagement
- 30 learning outcomes
- 30 reasons to participate

SURVEY
 N = 2032
 28 institutions

TYPES OF OUT-OF-CLASS ACTIVITIES (OOCAs)

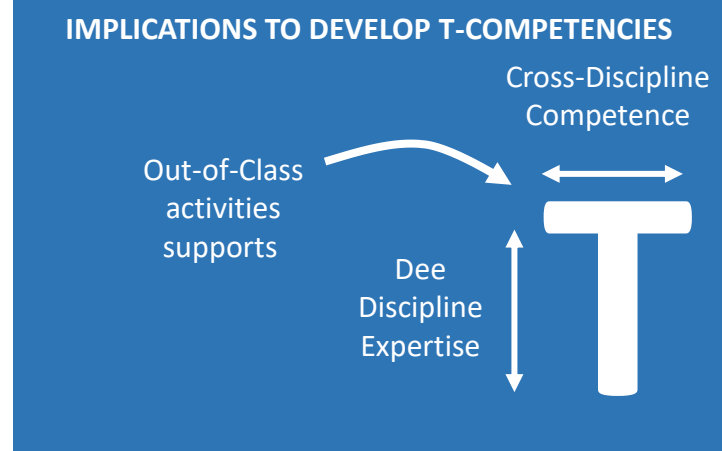
Curricular-related Co-curricular Extracurricular



OOCAs IS A MISSED OPPORTUNITY

Participants' perceived benefits of participating in OOCAs as they pertain to fun which is a missed opportunity to retain underrepresented groups in engineering

The study recommended implications for improving participation of engineering students in OOCAs as a path to developing T-competencies demanded by the workforce and avoid further marginalization of certain groups. For example, the study suggested implications to complement and leverage classroom instruction on engineering ethics by promoting engineering students' participation in out-of-class activities. The results indicated that students perceived ethical standards as an outcome from out-of-class activities, especially in pre-professional activities, coeducational sorority or fraternity, military, and job.



POPULARITY AND INTENSITY OF ACTIVITIES



Job
Sports



Living-Learning
Community

The study found that women were more likely than men to identify a living-learning community as their top activity. On the other hand, men tend to report job and sports as their top activities.

The study explored the structural barriers - specifically racism and sexism experienced by underrepresented students in engineering education and called for mitigating these barriers through research and instruction changing the culture and the role of allies.

STRUCTURAL BARRIERS: RACISM AND SEXISM



Explored the structural barriers - specifically racism and sexism and called for mitigating these barriers

PUBLICATIONS TO DATE

1. Chau, A. D., & Simmons, D. R. (2020). The impact of fraternity and sorority participation on NAE's engineer of 2020 outcomes for civil engineering undergraduates. Proceedings of the 9th International Conference on Applied Human Factors and Ergonomics and the Affiliated Conferences.
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11. Simmons, D. R. (2017). Reflecting on out-of-class involvement of engineering students as a path to retain underrepresented students. 7th International Research in Engineering Education Symposium (REES2017), 2017. Bogota, Colombia.
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