

UD College of Engineering Undergraduate Student Focus Groups November 2018

Description of study

In Spring and Summer of 2017, the University of Delaware Education R&D Center (DERDC), later renamed the Center for Research in Education and Social Policy (CRESP), conducted a focus group assessment of undergraduate student climate and culture in the UD College of Engineering. Twelve focus groups were held. Students were recruited for the study at random, and a total of 63 students participated. Four focus groups were conducted for women engineering students, two for students from URGs, two for student engineering groups that primarily serve students from URGs (i.e., National Society of Black Engineers, and Society of Hispanic Professional Engineers), and four discipline-clustered focus groups with majority students (i.e., white males). Analysis of the data revealed six overarching themes: (1) high school preparation; (2) interactions with peers; (3) interactions with faculty and staff; (4) professional identity; (5) program supports; (6) family support.

Key results and recommendations

Highlights

- Results indicate some common factors among academic units that may influence the issue of underrepresentation at UD; other more specific factors are related to particular engineering disciplines and to different demographic groups.
- Nearly all students who struggled in their engineering coursework reported attending high schools rated low quality by standardized measures, and/or did not have access to rigorous pre-engineering programming in high school. This issue disproportionately affected students of color and first generation students.
- Females and students of color reported being the target of peer micro-aggressions related to race and gender; these issues were more acute among students of color.
- Micro-aggressions directed at students of color by faculty were also reported in specific discipline clusters; whereas underrepresented students in other clusters felt that their faculty valued them as students, as evidenced by the quality of teaching and advising.
- Black students emphasized the importance of minority-focused student organizations and funding opportunities to support these structures for their success, while women put less emphasis on these same supports.
- Hispanic students stressed the need for more financial support and generally placed less emphasis on minority-focused student organizations.
- Overall, the results highlight the importance of disaggregating student experiences by engineering discipline and demographic group.

High school preparation for engineering coursework

- Findings from the focus groups suggest that student success in UD COE majors begins in the K-12 setting. Students who do not have access to high quality schools and rigorous programming in high school often struggle when they enter the college. Moreover, these results suggest a need for further investigation to determine how many of those who lack access to high quality schools have an interest in, but never get into the college and how many have left the college because they were struggling academically. As the college seeks to diversify its student body, exploration of ways to support K-12 programs, particularly those with low resources, to prepare and encourage students into engineering is key.
- Students in UD COE showed a genuine interest in participating in student outreach to support recruitment efforts for local schools. We encourage the college to support these efforts and to engage students in brainstorming other ways to support outreach. For example, the college may want to

consider ways that outreach can be built into course assignments or explore ideas for partnering with the College of Education and Human Development to encourage more involvement in communities and schools.

Peer interactions

- Students in the study highlighted the importance of peer interactions to academic success in UD COE, regardless of program. Students cited the current “weed-out” culture as detrimental to forming positive peer relationships because it breeds competition. We encourage the college to explore alternatives to grade curving through the university’s Center for Teaching and Learning.
- Women and members of URGs reported that peers engage in microaggressions related to students’ race and gender. There were also interpretations of these incidents that suggested that for some students, a lack of cultural awareness may play a key part in these negative interactions. As stated in the peer interactions section above, the responsibility of teaching students about culture and gender does not fall on the students from these underrepresented group. Moreover, experiencing and attempting to cope with these microaggressions have an impact on the mental health of underrepresented students. Thus, we encourage the college to provide trainings for students on discussing diversity issues in productive ways that promote learning, safety and respectability, and cross-cultural understanding. Students have expressed an interest in learning “soft skills” and cultural awareness is a topic that would be valuable to add to their skillset as they prepare for future employment.

Interactions with faculty and staff

- Students reported both positive and negative experiences with faculty. Among the most salient finding were concerns about faculty advising and the availability and helpfulness of the current model. We encourage the college to explore faculty perspectives on advising and then reconsider faculty advising options and explore solutions to student presented concerns. This may lead to exploration of the possibility of providing advising primarily through general engineering advisors.
- There were concerns about the accuracy and efficiency of TA grading. We suggest that instructors support TAs by providing answer keys and write-ups for homework and practice problems. Another suggestion to support TAs and opportunities for students to ask questions after processing information presented in class is for instructors to create online forums for students to post questions and get help from instructors, TAs, and other students.
- Students from underrepresented groups discussed their desire to work with a more diverse faculty. We recommend recruiting more faculty members who are women and/or members of URGs so that students feel that they have faculty and staff to relate to. As the college works to create a more diverse faculty and staff, we recommend providing opportunities for students to meet faculty of color who may be outside the college. One student suggested the organization of a social event for faculty and students from URGs so students get to know faculty across the university. Another possibility is to invite guest speakers or host an alumni panel made of members from underrepresented groups, so that the students can connect with those successful role models that share a similar background. Providing financial support to events outside of the university where students have an opportunity to network and connect with engineering professionals that look like them may also be a short-term solution as efforts are made to create a more diverse faculty in UD COE.
- As suggested for students, we recommend trainings for faculty and staff concerning cultural awareness. UD’s Center for Teaching and Learning provides training on inclusive teaching practices. The Delaware Education Research & Development Center Education also provides opportunities for training on culturally responsive teaching and offers opportunities for reflective and conscious-raising diversity experiences for faculty.

Professional identity

- Students in certain departments and those at the beginning of their programs had trouble seeing themselves as budding engineers. We suggest that UD COE offer students opportunities to connect their majors to some potential career paths. This should happen early in the first or second year.

- We also suggest that UD COE continues connecting students with internships, research opportunities and other professional experience such as attending engineering related conferences to help students build on what they've learned in courses in real world contexts.
- Students also mentioned issues in the sequencing of courses for some majors. We suggest that faculty work together to review course objectives and explicitly build connections between different classes so that students can clearly see connections between different classes.

Program support

- General suggestions for improving program supports include creation of a website to post research assistantships and internships by topical area to support student searches for opportunities. While most students felt that they received emails regularly about opportunities some felt that the opportunities were not geared toward their interests. Having a central site that categorizes opportunities may be more efficient for students and may also benefit the company and/or faculty member advertising the position as they only must post in one place.
- Students expressed frustration about the lack of available tutors for those who are upperclassmen and concerns about the available tutoring lists being outdated. Again, an electronic source for tutors may help in keeping the list up-to-date and graduate students who are available for tutoring should be added to the list.
- Students expressed concerns about losing their scholarships due to the GPA requirements of the university for scholarship recipients that does not consider the rigor of their program. This may serve as a barrier for retention of underrepresented groups as discussion concerning financial challenges came up most frequently with this population from our sample. We encourage the college to re-evaluate and possibly adjust the GPA requirements for students in engineering to a GPA that is more representative of a student in good standing within the college.
- Students in NSBE described concerns surrounding funding. The organization's members presented compelling efforts that they were taking to support the retention of students from URGs in the college. In addition, the funding requested by the students was to meet needs that the college was currently not meeting for students from URGs. While the college may make funding decisions for student groups based on equality (giving everyone the same amount of money), we encourage the college to consider making funding decisions based on equity.

Family support

- Regarding family support, one area of consideration is how the college can provide financial support to engineering students, including those who are transfer students. If it is not possible for the college to support these students, we urge the creation of a list of financial resources that students could seek for additional help.
- We also encourage the establishment and/or advertisement of mentoring programs so students who don't have family members in the engineering field or first-generation students can also benefit from role models.