

# Working on How to Solve the Never Ending Problem of Diversity

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**Abstract**—There are many challenges in changing the diversity in engineering. In the Catalyzing Collaborative Conversation, we explored ways to change the diversity climate through outreach, recruitment, and retention methods to help students succeed and achieve the goal of becoming an engineer.

## I. INTRODUCTION

Increasing diversity in engineering starts with getting students to make a decision to become an engineer. In 2016, the University of Illinois Champaign celebrated having 25% females in the incoming engineering class [1]. This is progress, but shows the distance to achieve gender equality in engineering education and the workforce. Only 19.9% of the bachelors degrees in engineering awarded went to women and 35.1% went to minority ethnicities in 2015 [2].

During the Catalyzing Collaborative Conversation there were about a dozen participants from universities around the world, including large traditional R1 and smaller universities. Participants were invited to contribute to the conversation as they felt comfortable, and the discussion was guided by the experiences of the authors leading the session.

## II. THE CONVERSATION

During the session we shared how we are addressing diversity at our institutions. Concerns expressed regarding outreach included costs and what to do when there is no budget. Participants' experiences suggest results can be obtained by changing guidelines and policies. A critical component to success mentioned involves working with admissions. The training of admissions to use a different vocabulary can mean the field is presented as more inviting and exciting. Admissions criteria can be adjusted to increase diversity by weighting class rank and leadership more and standardized test scores less. Similar modifications to the criteria for merit-based scholarships can impact diversity. Another approach is diversifying the faculty. The use of language analyzers can help eliminate unconscious bias in the wording of an ad by suggesting gender neutral wording.

One of the biggest issues raised concerning outreach that did cost money was demonstrating a return since often the outcomes do not show a direct benefit. Students that participate in outreach activities often go into a STEM field,

but they go into a different program or they go to a different university. The outreach results in a positive outcome when viewed broadly, but it can be difficult to justify the funds locally. One suggestion was to leverage the student groups to write personalized notes to accepted students to make them feel part of the community sooner. This may increase the likelihood of students choosing your program. Using post cards are cheaper, and parents will often see the message and may become invested in the student joining your university.

The conversation progressed to addressing retention. There was consensus that teaching assistants include underrepresented individuals so students can identify with the field. One school reported success getting undergraduates who served as teaching assistants to go on to graduate school. Providing students with a safe work space, such as a women's center with lab equipment so they can work at late hours and in a supportive environment, was implemented at one school. One school mentioned providing scholarships that require participation in an inclusive organization and other activities aimed at retention. This provides the students with a community of peers and tools for academic success. Another suggestion was to have students create videos sharing how they got through tough courses. These can be helpful for those students struggling who assume that their struggle is a sign that they do not belong in the field.

## III. CONCLUSION

These are just a few of the great suggestions offered. Thank you to everyone who participated. The problem won't be solved quickly. Some fields have a longer way to go than others and thus even more challenges. Through this collaborative conversation we are working towards a future in which the engineering environment is balanced and inclusive, when talks of diversity are no longer needed.

## REFERENCES

- [1] L. Ray, "Incoming class of women engineers breaks record," 23 08 2016. [Online]. Available: <http://www.illinoishomepage.net/news/local-news/incoming-class-of-women-engineers-breaks-record>.
- [2] B. L. Yoder, "Engineering by the Numbers," in *2015 ASEE Profiles of Engineering and Engineering Technology Colleges*, ASEE, 2015, pp. 11-47.