

A Diversity, Equity, and Inclusion (DEI) Task Force within a Mechanical Engineering Department

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Motivation and Background

The events and movements of 2020 have put into stark relief the fact that most academic institutions are not doing enough to address issues of diversity, equity, inclusion, and access among undergraduates. More specifically, these topics are often considered tangential to core engineering topics, and are therefore relegated to breadth requirements for coverage, if at all. However, faculty can and do influence the climate of the department and achievement of students through choosing to implement evidence-based teaching practices like active learning and inclusive teaching [1], and having a growth mindset in relation to the abilities of students [2]. It is also possible, for example, that the local climate in our department could cause students of color to be driven from STEM [3], or that a chilly climate could have a disproportionate impact on female students [4].

Over the course of the last several months, our department, college, and university have begun to create institutional structures to support these efforts. There is a new Associate Dean for Diversity, Equity, and Inclusion (DEI) at the college level, and at the department level a new Director of DEI position was created and filled by Prof. Rob Carpick (one of the authors of this work). This person has also created a DEI Task Force within the Mechanical Engineering & Applied Mechanics (MEAM) department (on which the other author is serving). While the full mandate of the DEI Task Force is still taking shape, the main goal is to tackle pressing issues related to DEI in the department, and to develop a longer-term action plan to address these issues. This will begin as a descriptive research project to take an honest look at where we are as a department to generate baseline data against which future interventions can be compared.

Over the past year there have been several curricular and extra-curricular efforts made along these lines, and this DEI Task Force will continue and coordinate these efforts. This is submitted as a **work in progress paper** on how re-thinking institutional structures that support DEI efforts can look within an engineering department. It is our hope that sharing our early efforts may encourage others to take on similar endeavors, and will also provide a reference point for future work of ours in this area.

Progress to Date

In this section we share a timeline of activity related to DEI issues that the task force has been associated with in some way. These are divided into department level and college level sections below. On the faculty & administration side, we have begun with building community within the DEI task force team itself. The department-level DEI director chose this team carefully and intentionally, and it is composed of faculty of different ranks (including tenured and non-tenure-track) and departmental staff. We meet regularly to share updates and build community. The task force has identified things that we can do as a department that range from immediately actionable items (e.g., a DEI statement on the syllabus) to longer term goals (professional development for faculty related to DEI issues, consistent advising, etc.). Many of these have also been suggested elsewhere [5].

Department level

- MEAM DEI Director appointed August 2020
- MEAM DEI Task Force Appointed
 - The Task Force itself is diverse, with 4 women, 3 Black members, 1 Hispanic/Latino member, 1 Asian member, 2 out LGBT members, and 4 immigrants to the US. Several members were FGLI college students themselves. One attended a HBCU for their undergraduate degree. Several have diverse family members, e.g., by marriage. All are committed to making serious progress on DEI issues including addressing racism, sexism, and other forms of bias.
- MEAM held an all-faculty meeting to discuss racism and racial equity issues as part of the #ShutDownSTEM event in June 2020. Discussion points/ideas/action items were captured and shared with all faculty and staff in MEAM.
- MEAM held an undergrad town hall on racism, racial diversity, and racial inclusion in June 2020. Discussion points/ideas/action items points were captured and shared with all faculty and staff in MEAM.
- MEAM faculty held an extended discussion on DEI issues at their annual faculty retreat. Discussion points/ideas/action items points were captured and shared with all faculty and staff in MEAM.
- Dean Vijay Kumar, Assoc Dean C.J. Taylor, Director of the Office of Diversity, Equity, and Inclusion (ODEI) Laura Stubbs, and Director of the Advancing Women in Engineering (AWE) program & Wellness Advisor Michale Rainey came to a MEAM faculty/staff meeting in Fall 2020 to share issues, share student feedback and examples of bias that have occurred, and to emphasize the importance of DEI issues
- Picture A Scientist events held in collaboration with WIM (Women in MEAM) including a virtual watch party and subsequent panel discussion focused on undergraduate students
- Another screening of Picture a Scientist aimed at graduate students and post-doctoral scholars
- "Building Community" section added to all MEAM newsletters (grad and undergrad). All faculty and were added to the newsletters.
- Newsletter featured prominent engineers for Black History Month, doing the same for Women's History Month
- MEAM is working hard on diversifying the faculty. First, we appointed a new Diversity Search Advisor (DSA), Prof. Douglas Jerolmack. The DSA monitors equal opportunity compliance in faculty appointment and promotion processes, actively promoting diversity and equity. Second, we placed a new ad to hire faculty this year, where we substantially changed the wording from past ads to make it much more inclusive and solicitous of diverse candidates [6].
- MEAM created the "MEAM Ambassadors" program. This is for the benefit of all students during the COVID era, to help build community. We were successful in recruiting a diverse group of Ambassadors to lead the program. This is one small but meaningful example of MEAM paying attention to diversity while setting up MEAM-wide programs.
- The Task Force held "DEI office hours" in Fall 2020 for MEAM undergraduate students to drop in and talk with two or three members of the DEI Task Force about any issues they wanted to discuss. This will be done again in the spring.

- We have reviewed mechanisms for nominating and reviewing our student awards and have made improvements to the process so that we regularly check that nomination pools are diverse, and we actively encourage nominators to promote diverse nominees.
- A Town Hall on racism, racial diversity, equity, and inclusion issues
- Prior to these recent efforts, there were a number of other changes:
 - Making the undergraduate curriculum more flexible (one motivation for this is that such flexibility tends to be helpful to students from underrepresented groups);
 - Hired our first female Senior Lecturer and assigned her to teach MEAM 101
 - Assigned a female faculty member to teach a section of ENGR 105. So now, many freshmen are exposed to a female MEAM instructor.
 - Also hired a number of other female faculty over the last few years (including part-time faculty)

College level

- DEI issues will be one of three pillars of the new strategic plan SEAS is forming that include improving climate, recruitment and retention, and outreach. All departments are participating in this effort including MEAM.
- Prof. Carpick joined a SEAS-wide effort to ensure diversity in the portraits displayed throughout the SEAS complex. As a first step, a new portrait space in the Towne Building that honors the accomplishments of diverse SEAS alumni is being created.
- SEAS also has launched an initiative and appointed C.J. Taolor as Assoc Dean for DEI. The role of MEAM DEI Director is on a SEAS-wide committee of "DEI Liaisons" under C.J. so that all departments work together on SEAS-wide issues and to support each other, exchange ideas, etc. Current SEAS-wide plans we are formulating include: setting up new faculty training on DEI issues; setting up new support mechanisms for students; and creating feedback/incentive/assessment mechanisms for faculty on DEI issues. These are ongoing plans but concrete progress is being made.

Results & Future Plans

Some early results of the activities were included above, but have also led to the following actions from the task force:

- Shared materials and resources amongst faculty to address DEI issues in syllabi, assignments, and in lectures
- Agreements to work on integrating DEI issues across the curriculum
- Reviewed recent student surveys for feedback on DEI issues and this was shared with faculty
- Compiled and shared extensive notes from the DEI Town Hall
- Hired two new faculty members to the department that will start in January 2022 that both represent diverse perspectives (1 Hispanic woman, 1 Black male)

The response to these events from undergraduate students has been very encouraging and mostly positive. However, to find out if any of these DEI efforts work, we need to look for evidence that it works [7]. As a department we plan to continue to articulate the mission of the DEI Task Force and engage in qualitative and quantitative research to establish a baseline relative to which we can measure progress. We are also currently involved in a proposal effort that will seek external funding for support in addressing DEI-related concepts throughout a four-course lab sequence in

the core undergraduate curriculum. Through this and many complimentary efforts, we plan to put in place a framework through which students and faculty can co-create a climate that fosters access and inclusion and leads to retention and success for all students.

References

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