

1. Introduction

This narrative describes efforts in UT Austin's Cockrell School of Engineering to address diversity, equity, and inclusion. The narrative mirrors the structure of the Cockrell School's Diversity, Equity, and Inclusion Plan (included as an appendix). However, we first examine our institutional context and diversity data, which inform our efforts.

1.1 Institutional Context: The University of Texas at Austin

The overarching mission of the University of Texas at Austin (UT Austin), is:

"The mission of The University of Texas at Austin is to achieve excellence in the interrelated areas of undergraduate education, graduate education, research, and public service. The university provides superior and comprehensive educational opportunities at the baccalaureate through doctoral and special professional educational levels. The university contributes to the advancement of society through research, creative activity, scholarly inquiry and the development and dissemination of new knowledge, including the commercialization of University discoveries. The university preserves and promotes the arts, benefits the state's economy, serves the citizens through public programs and provides other public service."

In supporting this mission, the Cockrell School also shares the institution's core values of:

- *Learning — A caring community, all of us students, helping one another grow.*
- *Discovery — Expanding knowledge and human understanding.*
- *Freedom — To seek the truth and express it.*
- *Leadership — The will to excel with integrity and the spirit that nothing is impossible.*
- *Individual Opportunity — Many options, diverse people and ideas, one university.*
- *Responsibility — To serve as a catalyst for positive change in Texas and beyond.*

In direct support of diversity, equity, and inclusion efforts, UT Austin adopted a formal diversity statement in 2019:

"As The University of Texas at Austin strives to meet its mission of unlocking potential and preparing future leaders of the state, it embraces diversity in many forms. The university is dedicated to attracting highly-qualified students, faculty and staff with a wide range of backgrounds, ideas and viewpoints. This includes those from all races and ethnicities; first-generation college students; women; and others who have been historically underrepresented on campus.

As a university with a past history of denying equitable access to qualified students, UT recognizes the profound benefits of creating an inclusive environment in which students can learn from one another. All students are better prepared to succeed in an increasingly diverse state and interconnected society when they receive the educational benefits of learning on a diverse campus."

These diversity and inclusion goals impact all facets of the university, from the classroom, to research, to the work environment. A wide range of perspectives and experiences is a key strength of the university, and the campus actively supports free exchange of ideas alongside thoughtful considerations of differences. UT Austin's *University Diversity and Inclusion Action Plan* (UDIAP)¹, collaboratively developed in 2016-2017 by students, faculty, and administrators, is regularly reviewed and updated. Since its adoption in Spring 2017, every college, school, and unit has been involved in making changes and embracing best practices to foster open, positive, and inclusive environments for everyone.

1.2 Institutional Context: The Cockrell School of Engineering

The mission of the Cockrell School is to: *educate leaders who think big and think creatively; pursue innovative solutions through research, industry partnerships, and a commitment to fostering entrepreneurship; encourage cross-disciplinary collaboration; and provide a supportive and inclusive environment for all members of our community.* The Cockrell School's Women in Engineering Program, established in 1991, and the Equal Opportunity in Engineering Program, established in 1970, have long histories in supporting underrepresented students through K-12 outreach programs, academic and career support, cultural awareness, and programs to connect students, staff, faculty, alumni and other

¹ <https://diversity.utexas.edu/actionplan/>

constituents. The Engineering Faculty Women's Organization (EFWO), established in 2002, organizes events for women faculty and gives a voice to issues commonly affecting women faculty, from the availability of on-campus childcare to modified instructional duties to cope with health and family events. The EFWO also provides informal mentoring across departments and career stages. Two large research centers (NASCENT and MRSEC²) have developed practices to advance a culture of inclusion and have built outreach pipelines for promoting diversity in STEM. UT Austin and the Cockrell School have invested in physical spaces that promote diversity and inclusion, including gender-inclusive restrooms, provided feminine hygiene products, lactation rooms, and deliberately designed collaborative spaces in new buildings.

The Cockrell School's Diversity, Equity, and Inclusion Plan

In support of UT Austin's efforts, we have developed a *Diversity, Equity, and Inclusion Plan*³, which is specific to the goals and the community in the Cockrell School. This plan's rationale, efforts, outcomes, and future priorities are detailed in the remainder of this narrative. The coordinated DEI efforts in the Cockrell School, which predate UT Austin's overarching UDIAP, were initiated in 2015, when a group of black students approached Dean Sharon Wood with a set of concerns related to the experiences of underrepresented minorities. As a response, Dean Wood formed the Cockrell School's Underrepresented Minority (URM) Action Team, which ultimately delivered a set of eight recommendations:

- **Recommendation 1:** The Cockrell School of Engineering should build a diversity action plan and update this plan on a periodic basis.
- **Recommendation 2:** The Cockrell School of Engineering should have a 3rd party design and facilitate a climate survey for students, staff and faculty to gain the necessary information and feedback about our current standing of diversity and inclusion.
- **Recommendation 3:** To increase participation and inclusiveness of the diverse populations, the Cockrell School of Engineering should create new programs which celebrate cultural awareness and provide rewards and encouragement for faculty who positively participate in activities with underrepresented minority students.
- **Recommendation 4:** The Cockrell School should review and update current messaging with inclusiveness and diversity awareness language for New Student and New Faculty Orientation programming.
- **Recommendation 5:** The Cockrell School of Engineering should develop diversity fellowships for graduate students and create an emergency fund for undergraduate students with financial need.
- **Recommendation 6:** The Cockrell School of Engineering should provide training on micro-aggressions and unconscious bias to all faculty, staff and students by partnering with external experts.
- **Recommendation 7:** The Cockrell School of Engineering should continue to support funding opportunities for URM advancement while including URM faculty in these submissions.
- **Recommendation 8:** The Cockrell School should create two committees: the Dean's Diversity Advancement Committee for Faculty Affairs and the Dean's Diversity Advancement Committee for Student Affairs

In parallel with the CSE URM Action Team, the Cockrell School launched the *You Belong Here* campaign⁴ to reinforce a commitment to diversity and inclusion in the school. This moniker is an umbrella for a variety of initiatives, from outreach and yield events for prospective students to programming and professional development for the entire school.



In 2016, Dean Wood created the CSE Diversity and Inclusion (D&I) Committee, consisting of administrators, faculty, staff, and students. This committee was chaired by the Director of the Equal Opportunity in Engineering Program and then by the Assistant Dean for Student Services. It is now chaired by the Assistant Dean for Diversity, Equity, and Inclusion, an administrative position Dean Wood created in Fall 2019 that is held by a tenured faculty member.

The Cockrell School's DEI Plan is a direct result of the URM Action Team's first recommendation. The plan was informed by the action team, the Diversity and Inclusion Standing Committee, and a series of charrettes conducted in 2017-2018, which were used to engage the entire community. The plan is structured around three "cornerstones": *Strengthening the Community*, *Shaping the Environment*, and *Enriching the Experience*. *Strengthening the Community* is broadly related

² <https://nascent.utexas.edu/>, <https://mrsec.utexas.edu/>

³ <http://www.engr.utexas.edu/about/diversity-and-inclusion/plan>

⁴ <http://www.engr.utexas.edu/you-belong-here>

to building a more **diverse** community through activities for K-12 students, undergraduate and graduate students, and faculty applicants. The second cornerstone, *Shaping the Environment*, focuses on programming and messaging, related to creating an **inclusive** environment. The final component, *Enriching the Experience* is driven by a vision of **equity**, and primarily focuses on ensuring that everyone in the Cockrell School community is supported to reach their full potential.

Based on the third recommendation, the D&I Committee created the Cultural Awareness Sub-Committee, which develops and hosts events that celebrate various cultures within the Cockrell School. Because of its success, this has become a full fledged committee that is now joint between the Cockrell School and UT's College of Natural Sciences.

The remainder of this narrative describes our efforts, outcomes, and plans related to the three cornerstones of our diversity, equity, and inclusion plan. We first present data related to existing diversity, equity, and inclusion efforts.

Cockrell School Diversity – By the Numbers

The following tables provide demographic data of the Cockrell School. As Table 1 shows, over the past five years, the Cockrell School has made gains in the number of women in all categories except Master's students. Other demographics are relatively flat over this time period. Of note are numbers for graduate students: the diversity of our graduate students trails that of the undergraduate population; this challenge pervades graduate programs beyond UT Austin and demands new approaches to change the playing field. While our diversity and inclusion efforts will continue to target increasing diversity across all categories, broadening the graduate student population is a specific future goal. The NASCENT and MRSEC research centers have developed initiatives to increase the pipeline of underrepresented groups in graduate STEM programs, which provide a starting point.

Table 1: Demographics of the Cockrell School from Fall 2015-Fall 2019. W: Women, B: Black, H: Hispanic, N: American Indian and Alaska Native

| | Fall 2015 | | | | Fall 2016 | | | | Fall 2017 | | | | Fall 2018 | | | | Fall 2019 | | | |
|-------------------------------------|-----------|------|-------|------|-----------|------|-------|------|-----------|------|-------|------|-----------|------|-------|------|-----------|------|-------|------|
| | W | B | H | N | W | B | H | N | W | B | H | N | W | B | H | N | W | B | H | N |
| Tenured/Tenure Track Faculty | 15.6% | 1.1% | 4.4% | 0.4% | 15.9% | 1.1% | 5.5% | 0.4% | 17.4% | 1.4% | 5.4% | 0.4% | 18.7% | 1.5% | 5.5% | 0.4% | 19.6% | 1.5% | 5.1% | 0.4% |
| Non-Tenure Track Faculty | 17.8% | 1.4% | 3.0% | 0.0% | 20.0% | 0.0% | 7.3% | 0.0% | 18.8% | 1.4% | 4.3% | 0.0% | 16.9% | 0.0% | 5.2% | 0.0% | 21.1% | 1.4% | 7.0% | 0.0% |
| UG Student Enrollment | 26.5% | 2.4% | 15.5% | 0.1% | 27.6% | 2.5% | 15.4% | 0.2% | 27.5% | 2.6% | 15.7% | 0.2% | 27.6% | 2.9% | 16.0% | 0.2% | 28.8% | 3.0% | 17.1% | 0.3% |
| Master's Student Enrollment | 24.7% | 3.0% | 7.8% | 0.2% | 25.0% | 3.1% | 7.8% | 0.2% | 24.4% | 3.4% | 8.0% | 0.2% | 25.4% | 1.4% | 7.1% | 0.4% | 23.8% | 0.7% | 7.3% | 0.3% |
| Doctoral Student Enrollment | 19.8% | 0.8% | 3.4% | 0.0% | 20.5% | 0.6% | 2.8% | 0.0% | 21.5% | 0.6% | 3.5% | 0.0% | 23.0% | 0.8% | 4.0% | 0.1% | 23.5% | 1.1% | 4.4% | 0.0% |

UT Austin has a campus-wide effort to increase four-year graduation rates. In the Cockrell School, just 32.1% of students who entered in 2007 graduated with an engineering degree in four years, and 61.6% graduated with an engineering degree in six years. For the same cohort, 41% graduated with some UT Austin degree within four years, while 81% graduated with some UT Austin degree within six years. Historically, these statistics are even starker for women and underrepresented minority students⁵. Table 2 shows how four-year and six-year graduation rates have changed over recent years. These changes are driven by a variety of new student success initiatives both within the Cockrell School and across campus. While the statistics indicate significant progress on all fronts, multiple points of concern remain. The graduation rates for underrepresented minority students remain significantly below overall rates.

Table 2: 4-year and 6-year Graduation Rates from Spring 2014-Spring 2018. W: Women, URM: Underrepresented Minority

| | Entered F2009 | | | Entered F2010 | | | Entered F2011 | | | Entered F2012 | | | Entered F2013 | | | Entered F2014 | | |
|--|---------------|-------|-------|---------------|-------|-------|---------------|-------|-------|---------------|-------|-------|---------------|-------|-----|---------------|-------|-----|
| | All | W | URM | All | W | URM | All | W | URM | All | W | URM | All | W | URM | All | W | URM |
| UG 4-year Grad Rate (engineering) | 31.4% | 27.9% | 18% | 38% | 40.2% | 27% | 40.9% | 42.1% | 28% | 44.3% | 47.5% | 33% | 46.8% | 48.9% | 33% | 52.7% | 56% | 35% |
| UG 4-year Grad Rate (any degree) | 41% | 44.1% | 26% | 47% | 54% | 37% | 49% | 52% | 37% | 52% | 59.5% | 40% | 56% | 62.3% | 44% | 60% | 67.8% | 44% |
| UG 6-year Grad Rate (engineering) | 59.1% | 55.9% | 46.0% | 65.1% | 64.9% | 52.0% | 67.4% | 69.1% | 56.0% | 70.4% | 71.5% | 60.0% | - | - | - | - | - | - |
| UG 6-year Grad Rate (any degree) | 79.0% | 84.4% | 68.0% | 83.0% | 86.0% | 73.0% | 85.0% | 90.0% | 78.0% | 86.0% | 91.4% | 76.0% | - | - | - | - | - | - |

Table 3 shows data for degrees conferred. The degrees conferred for graduate programs exhibit some trends that bear investigation. For instance, the percentage of Hispanic students enrolled in master's programs in Fall 2017 was 8.0%. However, two years later (the expected length of time for the MS degree), Hispanic students account for only 5.6% of the MS degrees conferred. Similarly, the rates of enrollment of women and underrepresented groups in doctoral programs appears to be higher (even accounting for the time-to-degree) than the graduation rates for those same students. We

⁵ The data available for this metric does not disaggregate categories of underrepresented minority students.

plan to analyze data related to graduate students more carefully to understand where barriers to enrollment and graduation exist; a planned climate survey will also investigate potential barriers.

Table 3: Demographics of Degrees Conferred Spring 2015-Spring 2019. W: Women, B: Black, H: Hispanic, N: American Indian and Alaska Native

| | Fall 2015 | | | | Fall 2016 | | | | Fall 2017 | | | | Fall 2018 | | | | Fall 2019 | | | |
|-------------------------------------|-----------|------|-------|------|-----------|------|-------|------|-----------|------|-------|------|-----------|------|-------|------|-----------|------|-------|------|
| | W | B | H | N | W | B | H | N | W | B | H | N | W | B | H | N | W | B | H | N |
| Bachelor's Degrees Conferred | 22.3% | 1.9% | 16.1% | 0.2% | 24.6% | 2.1% | 16.4% | 0.3% | 27.6% | 2.4% | 14.3% | 0.3% | 27.7% | 2.1% | 12.2% | 0.2% | 25.9% | 2.3% | 14.2% | 0.0% |
| Master's Degrees Conferred | 20.6% | 0.7% | 5.6% | 0.0% | 22.8% | 2.0% | 6.0% | 0.2% | 23.4% | 2.2% | 4.7% | 0.0% | 26.1% | 2.1% | 7.2% | 0.2% | 27.8% | 1.3% | 5.6% | 0.3% |
| Doctoral Degrees Conferred | 18.6% | 0.4% | 0.9% | 0.0% | 23.7% | 1.4% | 4.2% | 0.0% | 20.2% | 0.5% | 3.8% | 0.0% | 16.9% | 0.4% | 2.1% | 0.0% | 19.1% | 0.9% | 1.3% | 0.0% |

These numbers help measure diversity, but they do not give deep information about inclusion and equity. For these insights, we have historically relied on climate surveys. Our most recent survey was in Fall 2016/Spring 2017, conducted using the PACE (*Project to Assess Climate in Engineering*) survey. All 6,057 Cockrell School undergraduate students were invited to participate; 1,757 valid responses were received (a response rate of 29%). The survey asked about interactions with professors, perceptions of engineering as a career, satisfaction with the program, and the general climate in the Cockrell School. Overall, respondents were positive about interactions with professors: 78.6% selected “Usually” or “All the time” when asked whether “Professors care whether or not you learn the course material” and 89.9% chose “Usually” or “All the time” in response to “Professors treat you with respect.” Neither question had notable differences for women or underrepresented students. However, 13.5% of women felt they had been “singled out unfairly because of gender” and 13.3% of black students felt they had been “singled out unfairly because of race/ethnicity.” Further, 7.3% of students (20% of black students) have “heard engineering faculty express racial/ethnic stereotypes,” and 8.2% of students (14.5% of female students) have “heard engineering faculty express sexist stereotypes.” Finally, 19.6% of students reported they “Never” or only “Rarely” feel like “a part of the Cockrell School community.”

The Cockrell School also conducted climate surveys in 2012 and 2008. Analysis shows improvement in climate: 15.2% of women students felt they had been singled out unfairly because of gender, and 16.3% of all students (and 23.5% of female students) reported having heard engineering faculty express sexist stereotypes when asked in 2012. In 2020, we plan to repeat the climate survey using an updated survey. We will also survey graduate students, postdoctoral researchers, staff, and faculty to get a view of the climate from the perspective of all members of the Cockrell School.

In the context of these data, the following sections examine the three cornerstones of the Cockrell School’s Diversity, Equity, and Inclusion plan, detailing our ongoing efforts, outcomes, and plans for the future.

2. Strengthening the Community

The first cornerstone of our Diversity, Equity, and Inclusion Plan is *Strengthening the Community*, whose primary focus is on building a more diverse population within the Cockrell School:

Through well-planned and deliberate efforts, the Cockrell School will build a more diverse and inclusive community throughout the organization. This includes a commitment to not only hiring and retaining individuals who identify within groups traditionally underrepresented in engineering, but also individuals who do not identify within these groups but embrace, value, and champion diversity, inclusiveness, and equity as core elements of our culture.

2.1 Ongoing Efforts and Outcomes Related to Strengthening the Community

Our existing efforts to strengthen the Cockrell School Community focus on outreach, on changing the yield of traditionally underrepresented groups, and on retaining underrepresented groups among the students and faculty.

K-12 Outreach Efforts. Building a pipeline of young engineers must be a long-term part of increasing diversity in engineering. Through the Equal Opportunity in Engineering (EOE) Program and Women in Engineering Program (WEP), the Cockrell School offers many opportunities for K-12 students to explore engineering. The annual Girl Day at UT Austin⁶ engages over 8,000 K-8 girls in hands-on engineering and science activities, demonstrations, and shows led by over 150 corporate, university, and community partners and over 1,600 STEM role model volunteers. A DiscoverE⁷ national survey found that 92% of participants say they think about their future careers and that events like Girl Day help them a lot. In

⁶ <https://girlday.utexas.edu/>

⁷ <https://www.discovere.org/our-programs/girl-day>

addition, 69% of participants said the role models at Girl Day inspired them to consider engineering. The day-long YOUatUT pre-college program and the week-long CREATEatUT, WEatUT, and MITE residential summer camps⁸ allow participants to explore how engineering benefits society and impacts the world. Participating students engage in hands-on team projects and interact with engineering students, faculty, staff, and alumni. Surveys show that the camps increase participants' interest in studying engineering in college; understanding of how engineers are essential to health, happiness, and safety; and understanding of career paths in engineering. Approximately 30% of participants in WEatUT end up enrolling in the Cockrell School, and these students have a 6-year engineering graduation rate of 86%. WEP also leads the Texas Girls Collaborative Project (TxGCP)⁹, which fosters collaboration, builds capacity, and creates a state-wide network of informal and formal STEM educators and advocates. A 2015 survey of the National Girls Collaborative Project (NGCP), which includes TxGCP, found that 82% of participating organizations indicated NGCP collaborations helped their organization better serve girls. Further, 78% of participants indicated NGCP involvement helped them increase girls' interest in STEM, and 77% indicated that participation helped their organization increase girls' confidence in STEM.

Engineer Your World Curriculum Development. Faculty and staff in the Cockrell School have developed *Engineer Your World* (EYW)¹⁰, a student-centered high school engineering program that combines high-quality, design-based courses with innovative teacher training and support. Launched in 2011 with funding from the National Science Foundation, EYW responds to a national need for a high-quality, low-cost high school engineering course for all learners. Now in its ninth year, EYW serves approximately 10,000 students per year in more than 260 schools across 29 states. With a focus on improving engineering literacy and diversifying the engineering workforce, EYW engages students who are typically underserved by engineering programs. More than half of EYW schools serve predominantly economically disadvantaged students, and 57% of the schools are majority-minority. The EYW curriculum is intentionally designed to appeal to underrepresented students by framing engineering as a helping profession through which students can make a difference in the world, as recommended in the National Academy of Engineering's 2008 report *Changing the Conversation: Messages for Improving Public Understanding of Engineering*¹¹. EYW collaborates with educators to create resources for recruiting underrepresented students, including targeted flyers, a student recruitment video, and even guerilla marketing tips for teachers. These resources have helped partner schools increase minority participation: from 2012 to 2018, the population of EYW students grew from 25% to 28% women and from 30% to 49% URM students.

Faculty, Postdoc, and Graduate Student Recruiting and Retention. As part of efforts to diversify the Cockrell School, faculty search committees are trained in how to broaden, expand, and diversify candidate pools and make the recruiting process more equitable by addressing implicit bias. Each committee must identify at least one qualified female or underrepresented minority candidate for onsite interview, and the applicant pool is reviewed to ensure adequate representation prior to approval of interviews. Efforts to diversify the applicant pool include leveraging the nationwide Rising Stars program, which provides discipline-specific events for women graduate students and postdocs interested in academic careers. UT Austin's Oden Institute for Computational Engineering and Sciences hosted the first Rising Stars in Computational and Data Sciences at UT Austin in 2019, and the second edition will take place at UT Austin in April 2020. In recent years, the Cockrell School has also created programs to support faculty and grad students who become parents, including automatic tenure clock extension and accommodations for grad students.

The Biomedical Engineering Department required diversity statements in faculty applications starting in 2014. The Cockrell School adopted this practice in 2019 and now requires all applicants for tenured or tenure-track faculty positions to submit a "statement describing their commitment to promoting diversity and inclusion through research, teaching, and/or service." This request has two purposes: it allows applicants who are from diverse backgrounds or who have prior contributions to diversity and inclusion to describe those experiences and it communicates to all applicants that the Cockrell School is committed to promoting diversity and inclusion. We have developed a set of practices that go beyond simply requesting these statements; we will make diversity and inclusion integral to all phases of faculty search, from initial screening to on-campus interviews. For the past several years, the Cockrell School has included undergraduate student meetings in every on-campus faculty interview. We select a diverse set of students who

⁸ <http://www.engr.utexas.edu/wep/k-12-programs/camps/>, <http://www.engr.utexas.edu/eoe/k-12-programs/mite>

⁹ <https://www.txgcp.org/>

¹⁰ <http://engineeryourworld.org/>

¹¹ <https://www.nae.edu/24985/Changing-the-Conversation-Messages-for-Improving-Public-Understanding-of-Engineering>

participate in the interview and offer feedback as part of the process. This also gives faculty interviewees a view into the quality and diversity of our undergraduate student population.

Yield Events for Admitted Undergraduates. The three departments with the lowest percentages of women undergraduates have created campaigns to yield more admitted female students. These are in collaboration with WEP outreach efforts, including phone calls from current students, handwritten postcards from student organizations, letters to families of admitted women, and WEP Connect, which offers virtual and on-campus opportunities to connect with WEP staff and current students. In Mechanical Engineering, Elevate ME is a three-pronged campaign that includes receptions in alumni homes, t-shirts, and phone calls from alumnae to each admitted woman. In Aerospace, each admitted woman receives a t-shirt and an invitation to a brunch before a You Belong Here event that offers special access to labs, faculty, and current students. In Electrical and Computer Engineering, ECExcellence Day welcomes admitted underrepresented minorities, women, and honors students to meet with faculty, alumni, and current students. All three departments have seen increases in women undergraduates after the inception of these efforts. The yield among attendees of Elevate ME receptions is 85%, significantly higher than Mechanical Engineering's overall yield rate of around 50%.

Table 4: Increases in percentages of women undergraduates as a result of targeted yield events

| | Percentage of Women | |
|-------------------------------------|---------------------|------|
| | 2013 | 2019 |
| Aerospace Engineering | 13% | 22% |
| Electrical and Computer Engineering | 14% | 18% |
| Mechanical Engineering | 16% | 25% |

Student Success Programs. First generation college students have accounted for an average of less than 13% of incoming students for 2015 through 2018. We have developed initiatives for first generation students, including appointing a dedicated academic advisor and developing specialized programming for families. In 2016, we created the Ramshorn Scholar Program (RSP), a learning community dedicated to helping select undergraduate students persevere through the rigors of the UT Austin engineering curriculum. The program's goal is simple: to ease the transition from high school to college by supporting each student's individual needs. Over 70% of students in RSP are first generation college students. RSP offers reserved seats in select first-year courses, supplemental instruction, academic coaches, community building events, and leadership development experiences. In Fall 2019, first generation college students account for 17% of the incoming class. Generally, the Cockrell School's student success programs support a view that there is not a single right path to success, and so our programs must have multiple on-ramps and opportunities for recovery from setbacks.

First-Year Interest Groups (FIGs), small cohorts of 10-15 students with common interests, provide a tight-knit community within the larger Cockrell School. FIG members enroll in the same sections of first-year courses and meet weekly for community building and skill-building for student success. One-year retention of FIG participants is about 5% higher than non-FIG students. Through the NSF funded ENGAGE project, the Cockrell School also introduced a spatial visualization course for students scoring below an identified threshold on a spatial reasoning test. Post-tests showed that URM students who opted to take the course performed much better academically than their URM counterparts who qualified but did not take the course. These efforts show the dramatic potential of targeted student success initiatives; sustaining these programs and developing additional efforts is an important piece of our future efforts.

2.2 Next Steps for Further Strengthening the Community

While our ongoing efforts in strengthening the community have improved diversity in the Cockrell School, there is still work to be done. In the Cockrell School, all faculty who chair search committees are required to attend a diversity training offered by the provost's office. We plan to collaborate with the provost's office to develop a training that is more targeted to engineering faculty; our goal is to encourage *all* faculty in the Cockrell School to participate in this training.

Our existing efforts to mitigate biases in graduate admissions are small in scale. Given the demographics above, it is important to better understand these challenges and to better train faculty who review applications. This is an important focus of the NASCENT and MRSEC research centers, and we plan to leverage their resources and the expertise of the UT Austin Graduate School to develop better screening procedures for graduate and postdoctoral researcher applications. Efforts in the Biomedical Engineering Department, as part of a recent NIH T32 grant, have developed a new, more holistic application review with the aim of creating a more diverse admitted cohort and dedicated programs to channel diverse cohorts of undergraduates from summer research experiences into the graduate program. We will continue our

efforts to increase undergraduate yields, particularly in departments or programs with specific opportunities. To date, these efforts have focused primarily on women; we will extend them to target underrepresented minorities, an effort that began in 2018 when WEP and EOE collaborated to host an event for admitted women of color. Finally, postdocs are increasingly important in many areas of engineering. Short term future efforts will address challenges that postdoctoral researchers face and develop mechanisms to increase diversity and promote inclusion of all Cockrell School postdocs.

To date, many of the efforts of the Cockrell School have focused on diversity from a gender and race perspective; in the coming years, we hope to broaden our efforts to more explicitly address other facets of diversity, including Cockrell School community members based on disability status, gender identity, veteran status, or parental status, among others.

3. Shaping the Environment

The second cornerstone in the Cockrell School's Diversity, Equity, and Inclusion plan focuses primarily on inclusion in promoting efforts that shape the engineering environment. In particular, the plan articulates the following vision:

The Cockrell School is committed to ensuring that all members of the engineering community have the resources they need to excel and reach their potential. To that end, we will continue to create diverse, equitable and inclusive environments — both inside and outside of the classroom and workplace — that provide our students, staff and faculty with the types of experiences and interactions that will serve them better in their lives and careers.

3.1 Ongoing Efforts and Outcomes Related to Shaping the Environment

Changing the Conversation. The NAE's 2008 report *Changing the Conversation: Messages for Improving Public Understanding of Engineering* served as an impetus to shift messaging throughout the Cockrell School. The messaging was used in a t-shirt design competition for new students; to transform the descriptions of engineering majors; and to reshape K-12 programming. All members of the Cockrell School's student services staff were trained in the new messaging in Fall 2010, and the conversation was shared widely with high school counselors across the state of Texas beginning in 2011. The WEP Director has been leading presentations on Effective STEM Messaging since 2008 on campus, throughout Texas, and beyond. We have led 72 such presentations, reaching 3278 educators who serve over 330,000 students. Results from the PACE survey provide evidence that this intentional shift in messaging has a measurable effect. Compared to survey results from 2008 respondents in 2012 were more likely to report that society values the work of engineers, that engineers make the world a better place, and that engineering is a rewarding career.

The Cultural Awareness Committee. Since the launch of the Cultural Awareness Committee (CAC) in Spring 2017, the group has created events to celebrate the diverse cultures and backgrounds of the members of the Cockrell School. Initially the group hosted events like movie screenings and poster campaigns to highlight different cultural groups throughout the year. The committee has coordinated efforts to support the LGBTQIA+ and First Generation communities by supporting Day of Silence, Pride Month, and National First Generation College Celebration Day. It has grown and now also hosts multiple large scale annual events, including the Latinx/Hispanic Heritage Festival, the Black Excellence in STEM Festival, and the Asian/Pacific Islander Celebration, which are open to the public and attended by students, faculty, and staff. The CAC has amplified its efforts by becoming a joint committee with the College of Natural Sciences.

You Belong Here Workshop Series. The Cockrell School has developed the You Belong Here Workshop series, modeled after BiasBusters@CMU and Google's Bias Busting@Work. The series has been expanded through collaborations with UT's College of Natural Sciences to include workshops on micromessaging, inclusive leadership, inclusive spaces, and navigating the workspace. The current series includes eight workshops tailored for engineering and natural sciences students, faculty, and staff. The workshops can be varied in length and customized to the audience. Most include role-playing based on real-life scenarios, providing a powerful and effective approach to engage participants in creating personalized commitments to greater inclusivity. Since the creation of the series, the UT Bias Busters Team, including 77 members from across campus, has presented over 120 workshops reaching over 4,000 participants. Workshop participation has grown from 30 participants in a single workshop in 2016 to 539 participants in nine workshops in 2017, to 2,991 participants in 46 workshops in 2018. In 2019, the team is on track to deliver 60 You Belong Here Workshops, reaching over 3,000 students, staff, and faculty. The annual Cockrell School Student Leaders Conference (SLC), a day-long collaborative training and leadership development experience for students from across the Cockrell School, has also

integrated workshops and trainings from the You Belong Here Workshop Series to help student leaders understand implicit bias, learn strategies to create inclusive spaces, and practice bystander interventions. The SLC ensures quality and consistency of student employees and leaders within the Cockrell School; demonstrates to student employees and leaders that they are an integral part of the Cockrell School team; and provides participating students professional development experiences. In a post-conference survey, 95% of participating students indicated they learned something new, and 98% indicated that they were confident they could contribute effectively in their student leader role.

3.2 Next Steps for Further Shaping the Environment

Our efforts in shaping the environment promote inclusive communities in the Cockrell School. Our most well-established mechanism is through the You Belong Here campaign, whose messaging we plan to extend to better leverage faculty as conveyors of the message. The You Belong Here Workshops are founded around the Bias Busters training; we are exploring more rigorous evaluation methods to assess the impacts of the You Belong Here campaign on culture and climate throughout the Cockrell School. The upcoming climate survey (planned for Spring 2020) will, for the first time, cover faculty, staff, and graduate students in addition to undergraduate students. The survey results will aid in the assessment and comparisons with historical Cockrell School data and information about other institutions.

The Cultural Awareness Committee continues to identify more ways to further support inclusion. For example, we will encourage participation in supplementary graduation events; UT Austin hosts a Black Graduation, Latinx Graduation, and Lavender Graduation (for students who identify as LGBTQIA+) each spring. The Black and Latinx Graduations charge an attendance fee (\$40), and Lavender Graduation provides a rainbow stole for every participant (at a cost of \$20 per stole). Starting in spring 2020, the Cockrell School will cover the cost for engineering students who participate in any of these three ceremonies. The goal is to relieve any potential financial barrier to attending the events and to actively support our students as they celebrate graduation in their intersectional communities.

4. Enriching the Experience

The third cornerstone of our Diversity, Equity, and Inclusion Plan focuses on fostering equity in Cockrell School programs, aiming to ensure that all members of the community receive the support needed to reach their full potential:

The Cockrell School is committed to an educational experience that ensures all members of the community can reach their potential in an increasingly diverse and multicultural world. We will provide the best, most complete education possible for students from all backgrounds, and we will enhance the workplace environment to provide a more inclusive experience for faculty and staff.

4.1 Ongoing Efforts and Outcomes Related to Enriching the Experience

Faculty and Staff Mentoring and Professional Development. An essential component of new faculty's success is mentoring from more senior faculty. Every new assistant professor in the Cockrell School is assigned an official mentor, and the school holds a kickoff luncheon every academic year to introduce the mentors and mentees to the program. In addition, the Engineering Faculty Women's Organization (EFWO) holds luncheons with women candidates during their interviews, which often pivot into career-long mentoring through formal and informal events. Staff members who support students through advising and programmatic initiatives have monthly professional development during the academic year, and much of this training focuses on diversity, equity, and inclusion. Sessions have addressed strategies to support student veterans, assist students with disabilities, recognize and respond to students in distress, understand resources available in the Gender and Sexuality Center, help students in crisis, and provide services for student-athletes.

Professional Development Courses for Students. The Cockrell School offers many professional development seminars and courses for students. The WEP Leadership Seminar helps students explore leadership and communication styles through a gendered lens using interactive role play, personal assessments, industry guest speakers and role models, and discussions that explore the impact of diverse identities in leadership. The EOE Program provides career and leadership development seminars focused on individual awareness, self-efficacy and success. The Ramshorn Scholars Program helps students strengthen their engineering identity through a variety of workshops on engineering design, communications, working with global teams and creating collaborative workplaces. A pilot program in Electrical and Computer

Engineering has developed “byte”-sized courses on topics ranging from designing printed circuit boards, to the Linux operating system, python programming, and Blockchain. These courses are designed as one-credit highly accessible courses to bootstrap skills that prepare students for internships and to launch their careers. An additional bytes course on professional development focused on giving and receiving feedback in the technical workplace, including the potential impacts of unconscious biases. This course culminated in a hands-on experience project giving feedback to faculty instructors on classroom activities. Multiple programs across the Cockrell School actively support undergraduate research; several of these target women and underrepresented minority students directly.

Well-Being in Engineering Classrooms. In Spring 2018, Cockrell School faculty joined a project in UT’s Counseling and Mental Health Center promoting well-being in learning environments¹². The project is based on research demonstrating that well-being is essential to students’ effective learning; currently, twelve Cockrell School faculty are collaborating with the project to actively work to embed wellness practices in instructional environments. Over the past two years, more than 1300 Cockrell School students have participated in these classes. Wellness strategies Cockrell School faculty are using include incorporating growth mindset techniques; encouraging positive psychology strategies; using cooperative learning activities to enhance students’ conceptual understanding and build social connectedness; talking directly with students about practicing self-care (e.g., getting enough sleep, taking brain breaks); and humanizing themselves by talking about their failures. These efforts build on a successful history of *Cookie Connections*, a program in which cookies are delivered to lower-division courses and instructors spend time talking about something of interest to them, from career opportunities, to their own professional paths, to how they manage stress. Student responses to Cookie Connections are overwhelmingly positive, and the most often cited value is the ability to connect with the instructor.

Cockrell School Cares. The *Cockrell School Cares* (CSC) initiative began in 2018 as a week-long student-driven campaign to promote mental health, diversity, inclusion, and equity. Since its inaugural year, CSC has grown in length and scope. In April 2019, CSC’s two-week campaign comprised 27 events that emphasized student well-being. Some notable events include sessions on helping a friend in distress, healthy eating, embracing failure, overcoming racial barriers, understanding masculinity, and the imposter syndrome. Professors and staff serve as guest speakers for a number of these events, and many professors offered extra credit to students for attending and participating in CSC. The 2019 campaign had over 900 student attendees. This year, CSC has grown into a 40-member external committee of the Student Engineering Council and plans year long events as well as a two-week campaign in the spring.

CARE Counselor. The Counselor in Academic Residence (CARE) program, initiated in Fall 2015, provides a counselor from UT’s Counseling and Mental Health Center to work within Engineering Student Services. The Cockrell School CARE Counselor supports students who are struggling academically due to non-academic reasons such as stress, anxiety, depression, or relationship or family problems. The CARE counselor provides short-term individual counseling; consultation for advisors, faculty, and staff; workshops and training; support groups; and crisis intervention and postvention, all with an understanding of experiences and needs of engineering students. The CARE Counselor’s recent workshops include a program on “Managing it All” for first year interest groups and a staff training on responding to students in distress. In 2018-2019, 186 individuals visited the Cockrell School’s CARE counselor, across a total of 647 sessions. Figure 1 shows the distribution of student-reported presenting concerns; this information informs efforts in developing new programs that respond to the needs of students.

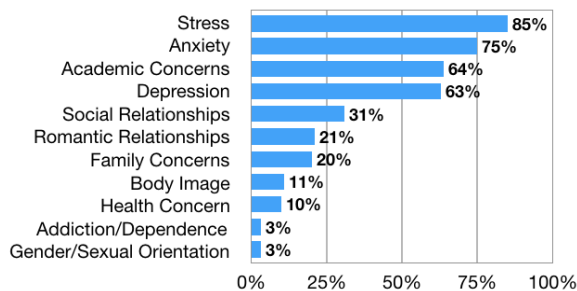


Figure 1: Student-reported presenting concerns for CARE

Emergency Fund. The URM Action Team recommended the creation of an emergency fund for students in financial distress. This program was created in 2018 and has run continuously since. The director of student scholarships and fellowships oversees the fund, which has been instrumental in providing temporary, short-term support for students in need. This is done in collaboration with the UT Austin Office of the Dean of Students, which also offers small (\$20 - \$300) awards to students in need across campus. When an engineering student seeks assistance from the Office of the Dean of

¹² <https://cmhc.utexas.edu/wellbeing/>

Students, the request is forwarded to the Engineering Scholarship Program, which further evaluates whether the student has remaining unmet needs. These students, as well as students referred directly by Cockrell School staff or faculty may then receive scholarship or fellowship awards as well as non-resident tuition waivers for out-of-state or international students. In 2018-2019, nine Cockrell School students received an average award of \$1,590.

Cockrell School Student Organizations. The Cockrell School includes chapters of the National Society of Black Engineers (NSBE), the Society of Hispanic Professional Engineers (SHPE), the Pi Sigma Pi Minority Academic Engineering Society (PSP), the LGBTQ+ Engineers (LGB QT-ies), and the Society of Asian Scientists and Engineers (SASE). The WEP Leadership Collaborative includes the leadership of Cockrell School organizations that support the success of women in the Cockrell School, including a chapter of the Society of Women in Engineering (SWE) and a SWE-Grad community focused specifically on graduate students. The Society of Hispanic Professional Engineers Señoritas serves all undergraduate Hispanic women, and all seven departments have at least one organization supporting women students in the discipline. UT Austin is also home to Black Women in Science & Engineering (BWISE) and the Association for Women in Science (AWIS), which both serve students across engineering and natural sciences. To support these organizations, the Cockrell School holds a number of leadership development events. Monthly *Presidents' Meetings* bring together the presidents of the 50+ Cockrell School organizations with a member of the advising staff to facilitate collaborations; these meetings often focus on cultural awareness through diversity and inclusion centered programming. Through these interactions, the school leverages student organizations to extend diversity and inclusion efforts and integrate them with student life.

4.2 Next Steps for Further Enriching the Experience

Making it possible for all members of the Cockrell School community to reach their full potential is the focus of this third cornerstone. The Cockrell School is actively engaged in efforts that target equity for students, staff, and faculty, across many dimensions. At the campus level, UT Austin's University Faculty Gender Equity Council (UFGEC), the Council for Racial and Ethnic Equity and Diversity (CREED), and the Council for LGBTQ+ Access, Equity, and Inclusion (Q+AEI) have, among many other initiatives, been studying equity issues related to faculty, including salary differences, time to promotion, and differences in the tenure-track and non-tenure-track. In concert, these groups are working to define policies and practices that promote inclusive climates for all faculty, and these councils all include active representation from faculty from the Cockrell School. These efforts and others on campus have resulted in a variety of formal and informal reports and recommendations, which will further inform our future efforts related to equity.

5. Conclusions

UT Austin's Cockrell School of Engineering strives to create an inclusive environment where everyone can learn and work in a positive and supportive atmosphere. We are committed to diversity, which we believe is a fundamental part of engineering education. Our efforts to date have focused on all three pillars of diversity, inclusion, and equity, as we strive to strengthen the Cockrell School community, shape the Cockrell School environment, and enrich the experience of all members of the Cockrell School. We have leveraged significant campus-wide infrastructure to support diverse populations, including populations traditionally underrepresented in engineering, including women, underrepresented minorities, LGTBQ+ persons, and first generation students. We have also constructed engineering-specific infrastructure and programs for diversity and inclusion; many of these efforts are evident in our Diversity, Equity, and Inclusion Plan, whose future implementation will be shepherded by the newly created Assistant Dean for Diversity, Equity, and Inclusion. Within the Cockrell School, we run a variety of general engineering and discipline-specific summer programs to assist students in the transition to the Cockrell School, which have built on the hugely successful and long-established K-12 outreach programs hosted by the Cockrell School. We are working to build more training and development for students, faculty, and staff to help identify and mitigate biases and more generally create positive and supporting working and learning environments. In Fall 2019, UT Austin joined the Aspire Alliance's iChange network¹³, a program funded by the National Science Foundation to help institutions develop and strengthen inclusive recruitment, hiring, and retention of faculty in STEM. Members of the Cockrell School will work with others across campus to ensure that we continue to ensure the inclusion and success of a diverse Cockrell School community.

¹³ <https://www.aspirealliance.org/institutional-change/ichange-network>