Design and Implementation of Privilege for Sale, a JEDI Activity for a Biomedical Engineering Introductory Course

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Abstract—An increasing body of knowledge points to the need for the integration of Justice, Equity, Diversity and Inclusion (JEDI)-based topics into undergraduate and graduate curricula. The Racial Justice and Equity, Diversity and Inclusion (REDI) committee designed and implemented a short activity in an introductory undergraduate biomedical engineering course. The activity was designed as a facilitated small group discussion (4 students), preceded by an introduction to the activity, community rules for engagement and a call to reflection of privilege. Groups of students were guided to rank 3 privileges (out of a list of 5) that they valued as contributing factors to their success. Through the activity, situational and social contexts were identified by students in how they valued privileges, and overall fostered a robust discussion amongst peers about their roles and responsibilities as biomedical engineers. The activity engaged students to self-reflect on what they considered as privileges that contributed to success in college. In future re-offerings, the activity is likely to be more impactful when combined with resources that can facilitate calls to action and allyship.

Keywords—Engagement, Reflection, Privilege, JEDI, Biomedical engineering.

CHALLENGE STATEMENT

Biomedical engineering curricula are generally devoid of diversity-related topics despite a strong need to foster diversity and inclusion awareness within our students to tackle health disparities and technological inequities.[1] While these topics have been increasingly included in graduate curricula, especially in medical schools,[4] tackling healthcare disparity is not just the role of physicians, but that of the entire biomedical community. Especially in the biomedical engineering curriculum, the over-reliance and false dichotomization of engineering into hard/soft skills[2] has the propensity to create biomedical engineers that are unaware of institutional challenges that propagate inequity. This shared responsibility creates a need for the introduction of Justice, Equity, Diversity and Inclusion (JEDI)-based reflections earlier in the undergraduate curriculum, especially in that of biomedical engineering.[12] The Racial Justice, Equity, Diversity, and Inclusion (REDI) committee within the Biomedical Engineering Department at Texas A&M University is working with faculty within the department to develop JEDI-related educational modules to integrate throughout our curriculum. Typical course modules include a wide range of topics such as disparities in biomedical device performance on diverse populations, diversity within the historical and current biomedical engineering community, and the impact of social disparity on health care outcomes. To initiate JEDI-topics within our curriculum, the REDI committee was invited to meet the second year students enrolled in BME 153, an introductory biomedical engineering course (Pathways in Biomedical Engineering). For this introductory module, the REDI committee intentionally worked to dissociate biomedical ethics from JEDI, a challenge owing to its usual conflation in the biomedical engineering classroom despite its unique intersectionality. The REDI committee used this presentation as an opportunity to (1) introduce the REDI committee and our goals to improve diversity, equity and inclusivity within the department, (2) explain the

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relevance of REDI to the students' study of biomedical engineering, and (3) engage the students in an activity for self-reflection on their own privilege and the relevance of privilege to success in college.

NOVEL INITIATIVE

The REDI committee designed a two-part module that consisted of an initial lecture portion and a privilege selection activity. The module was designed by the REDI committee which is comprised of faculty, staff, undergraduate and graduate students within the Biomedical Engineering department at Texas A&M University. A draft of the module was initially proposed by the committee chair, and subsequently iterated using feedback from all committee members. The feedback of the students was particularly important for the success of the activity.

While explicit learning objectives were not conveyed to the students during this first offering, the design of the module began with specific goals as outlined below:

i.
Expose sophomores entering the Biomedical Engineering major to the existence of the Respect, Equity, Diversity and Inclusion committee, and its members

ii.
Increase awareness of an anonymous reporting portal, aimed to reduce instances of hate or bias on campus.

iii.
Expose students to the concept of 'privilege' and allow them to reflect with their peers on why some experiences were valued as privileges.

iv.
Provide students with an opportunity to develop empathy and promote understanding of their peers and their identities within small groups.

In future re-offerings, the authors hope to structure this activity with explicitly stated learning objectives that will allow learners to gauge the effectiveness of the module against its intended goals.

A graphical sequence of events is provided in Figure 1, for how the time in the class room was structured. The lecture portion of the module was designed to introduce the REDI committee and explain why diversity, equity, and inclusion are important topics for biomedical engineering education. First, the REDI committee members were introduced using casual photographs of the committee members to aid relatability. Then the REDI committee's purpose and goals were defined and resources were provided for reporting

an incidence of bias or hate. Finally, we briefly motivated the need for REDI topics within Biomedical Engineering class by highlighting the advantages of diverse teams and the importance of diversity and inclusion for medical care.

We included an activity for engagement of the students and a practical demonstration of the relevance of different privileges for success in higher education. Our activity was based on the privilege walk[9] where participants take a step forward or backwards as instructed by statements (example: "If English is your first language take one step forward"). The Privilege Walk activity allows observers to reflect on their own privilege relative to their peers by assessing how far they walk across the room. The student members of the REDI committee expressed concerns that the Privilege Walk required students to publicly disclose information about themselves. The students suggested an alternative approach where small groups of students (up to 4) are provided an allotted budget and must purchase privileges. Although variants of this approach include giving groups different budgets and weighing privileges different amounts, due to the limited time of our activity (~10 min), we decided to keep the activity simple and define 5 privileges, each of which cost $100 and each group was given $300. The privileges for sale were:

- English is your first language.
- Either one of your parents graduated college or your family encourage you to attend college.
- You have existing connections to a potential employer/professor who can offer you a job/research internship.
- You are a US citizen
- You have no college loans or other financial stressors.

Privileges were identified from a list curated by the University of Houston Center for Diversity and Inclusion. The authors believe it important to note here that the original worksheet was "intended to provide an engaging, hands-on activity that allows participants to gain a greater understand of Diversity, Equity and Inclusion topics". More specifically, the original Privilege walk workshop and activity was meant to highlight to college students that by reflecting on their privileges, one could collectively find ways to use them for social justice.[8] The REDI committee conferred over the list of privileges, over a month, and voted extensively for their top 5 for inclusion, based on diverse personal experiences and anecdotes. Some of the experiences included immigrant identities, historically excluded racial identities, as well as, low socioeconomic status or first-generation backgrounds.

Design of 'Privilege for Sale' - an activity by the REDI Committee

Activity-specific Design goals

1. Expose students to the concept of 'privilege' and allow them to reflect with their peers on why some experiences were valued as privileges.
2. Provide students with an opportunity to develop empathy and promote understanding of their peers and their identities within small groups.

| Introduction to REDI Committee and charter (2 minutes) | Importance of Diversity, Equity, and Inclusion in Biomedical Engineering | Community Rules of Engagement |

'Privilege for Sale' Activity Set up

Divide students into groups of 3-4

Recommended facilitator to student group ratio is 1:3

Present activity instructions (each group has $300 to buy 3 hypothetical privileges that cost $100 each)

Emphasize that discussions are private and individuals are not required to share their privileges

Present list of privileges and facilitate small group discussions

1. English is your first language
2. Either one of your parents graduated college or your family encourage you to attend college
3. You have existing connections to a potential employer/professor who can offer you a job/research internship
4. You are a US Citizen
5. You have no college loans or other financial stressors

| Collective call to action to biomedical engineers to improve health disparity | Concluding remarks on peer support and allyship |

FIGURE 1. A graphical rendition of the sequence of events leading up to the 'Privilege for Sale' activity presented in a sophomore 'Pathways in Biomedical Engineering' course.

Through extensive discussion and consensus voting, these 5 statements were picked as privileges that our student body would be able to discuss and reflect upon with their peers.

Prior to the start of the activity, we defined reality, equality, equity, and justice and explained that we are not all equal due to differences in our personal privileges, and that the same solution (i.e. equality) would not solve systemic barriers for all. The goal of the activity was to foster discussions within small groups of what privileges peers enjoyed, and what they valued both individually and collectively. Facilitators from the REDI committee walked around the classroom, to listen in on the discussions, and guide groups towards identifying the top 3 privileges they valued most, and why. The students were informed several times that their perspectives did not have to be public outside of their small group, but were told that a facilitator would listen in on their conversations to guide them if needed. This allowed for a robust discussion on the five privileges presented, as students tried to discuss and reflect

BMES BIOMEDICAL ENGINEERING SOCIETY

on why some might matter more to them personally than some others.

Community rules were discussed at the outset of the activity to ensure productive discussions. These included:

1. Engage in *active listening*: truly hearing, respecting, and valuing what our peers have to say.
2. Foster an environment of *support, kindness, and compassion*, assume the best out of everyone.
3. Please *challenge ideas instead of attacking people*.

Learners and observers conducted this activity for ~10 min, following which a conclusion slide was presented based on our collective and shared responsibilities towards allyship following the recognitions of our own privileges.

REFLECTION

The Privilege for Sale activity was moderated by the REDI committee for 145 students of two sections of BME 153: Pathways in Biomedical Engineering. BME 153 is the first class second-year students take upon entry to Biomedical Engineering as a major. The REDI committee chair discussed the lecture slides and introduced the activity. The lecture portion of the module was completed within 3–4 min, a time that was short enough to retain student attention. Students self-selected into groups of 2–4 by their tables. Student and faculty members of the REDI committee helped facilitate the discussions, with a facilitator to student-group ratio of 1:3.

Community rules of engagement were discussed emphasizing on kindness and empathy, which set the tone for the ensuing discussions. In order to encourage students to reflect on privileges, and a segue into the 'Privilege for Sale' activity, the presenter introduced the notion of Reality, Equality, Equity and Justice to the students. Currently these definitions were based on 'access', and not biomedical engineering specific. For example, students were explicitly told that disparities exist as a reality, either in access (to healthcare intervention or otherwise), and that improving access didn't require equal interventions, rather equitable interventions. While the concept of justice was defined as the removal of systemic barriers that produced the disparity, in a future re-offering, the authors want to consider a more explicit tie-in to Justice and the 'Privilege for Sale' activity. In the future, after discussing community rules for engagement, we will explicitly set the tone as allowing students to reflect on their privilege, and find opportunities to collectively use their privileges towards justice.

All students participated in discussions with their groups about the privileges and which they would like to purchase with their money. Students discussed why they valued the privileges they selected and explained their reasons to their peers and facilitators. Many of the students shared their own experiences to provide context for their privilege sections. The facilitators helped prompt reflection by asking students why they selected different privileges and posing scenarios for the students to consider.

Many of the students recognized that privileges are often situational and context can alter equity. For example, one group discussed the relative value of the privilege "English is your first language" for a person who is learning English as a second language as a child versus as an international college student. For several of these students, English was their second language, learned at a young age. While they did not initially recognize the value of "English is your first language," they recognized that their experience and privilege would be very different from someone immersed in English later, as is the experience of many of our international students. Consequently, most groups valued US citizenship higher than English as a first language. A potential variant of this activity to increase the relevance to BME and highlight the fact that privileges are situation dependent would be to pose a second scenario, such as "Imagine you have just graduated and been hired as an engineer to work for a medical device company in Japan, which privileges would you purchase?"

We did not ask the students to report which privileges they purchased. However, the facilitators noticed that across the groups, and often within groups, every privilege was purchased, demonstrating that each of the five privileges is important to our biomedical engineering students. Every group valued "financial support", and most wanted "existing connections". Several groups also curiously connected the two privileges, since existing connections could be leveraged to financial independence upon completion of study. Importantly, most groups had students self-identifying as first-generation, and then making their case for why "having supportive parents or family" was an important factor in their presence in the BME classroom.

In future re-offerings, we expect to collect formalized feedback from students in the classroom led by the instructor, to evaluate student perceptions to this activity. Survey questions will explicitly evaluate students' prior interactions with REDI topics within the BME coursework and the effectiveness of the module to introduce the REDI committee and goals. We envision asking participants to also respond to the prompt: "I am more likely to appreciate the different types of privileges granted to me because of my expe-

rience with this activity'' and provide additional comments to the REDI committee following the activity. In its first offering, no formal feedback was collected. However, instructor and graduate student facilitator feedback indicated that the activity itself was thought-provoking, but did not provide a shift towards action among the students. To address this, in future re-offerings, the REDI committee will likely include guidelines to students on allyship and advocacy, and present resources for JEDI activities and student success available broadly on campus and in the online community.

Overall, the Privilege for Sale activity was a good one to introduce undergraduate biomedical engineering students to the REDI committee, and to introduce JEDI relevance into biomedical engineering curriculum. A framework of learning objectives of JEDI topics is important to facilitate JEDI throughout a BME curriculum. Here is an example list of JEDI-related learning objectives that encompasses both general introduction and skills related to diversity and inclusion as well as BME-specific considerations of inequality to medical access and bias in medical device design. These objectives are adapted from several resources[5, 6, 10] which provide additional JEDI research objectives and guidance for JEDI-integration in higher education.

Learning objectives for JEDI knowledge for BME students:

- Demonstrate an openness to new perspectives and diverse people
- Learn and implement skills for intergroup dialogue
- Employ allyship techniques to address bias and microaggressions
- Recognize and critically reflect upon one's own cultural biases and privileges
- Acknowledge and analyze medical disparities due to race, gender, socioeconomic factors, etc.
- Analyze and critique bias in medical device design

The authors believe that the 'Privilege for Sale' activity meets several of these learning objectives, "Demonstrate openness to new perspectives and diverse people", "Learn and implement skills for intergroup dialogue", and "Recognize and critically reflect upon one's own cultural biases and privileges". The discussions the activity fostered requiring students to recognize that what privileges they might enjoy will ultimately result in increased cultural competency, an acute awareness of STEM diversity and the individual roles and responsibilities of an ally.[7, 11] The REDI committee is also actively engaged in efforts that encourage curricular inclusion of topics across learner levels, as they relate to equity and justice. The notion

that students will continue to hear about these topics in most biomedical engineering courses (and not just the introduction to BME course or bioethics) requires slight pedagogical shifts but can powerfully address privilege as it pertains to institutional barriers.[3] Lastly, we envision that such activities can be tied to formalized ABET student outcomes, especially outcome #4, which evaluates programs that can promote "an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts". Explicitly linking JEDI-based offerings to accredited student outcomes will pave the way to remove the culture of bias, and create culturally competent biomedical engineers that promote justice and equity.

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CONFLICT OF INTEREST

The authors declare no competing interests.

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