

Problems of Our Own Devising: Individuals' Challenges in Enacting Systemic Changes to Increase the Inclusivity of Engineering Departments

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Issues of power and oppression within the academic setting have been an ongoing concern for universities across the global community, and have become more prominent at this cultural moment. In an effort to address the topics of social justice, equity, and inclusion many universities and groups of faculty and students have focused on ways to educate STEM student and faculty populations.

There is a complex and continually developing body of literature discussing and reflecting on reform efforts both in engineering education and more broadly. This literature can simplistically be classified into three general types: (1) calls for action that explain and provide evidence concerning the needs for reforms [1], e.g. , [2]; (2) research describing the reform process e.g. , [3], [4], and; (3) research examining why most reform efforts fail [5], [6].

This third type of article is particularly important to the work described here. Like many people in the engineering education research community we are engaged in reform efforts throughout our department, college, university and university system. We are well aware of the gap between the development and deployment of effective practices in our community [5], [7]. As reformers seeking to be informed, we are drawn to this third category of literature in the hopes of avoiding common pitfalls and developing new practices.

In a recent guest editorial in the *Journal of Engineering Education* Herman and Lowenstein (2017) distilled these findings into guiding principles for what they called “evidence-based change practices.” Citing a broad range of literature they argue that reform efforts need to be firmly rooted in the values and interests of the people who will be engaging most with changing system. Herman and Lowenstein note that reform efforts need to be based on listening so that change efforts can be recast in terms of the stories people already tell about themselves and their institutional systems. Lastly they argue that reform efforts—particularly those intended to change cultures to be more inclusive, just and equitable—need to demonstrate inclusive, just and equitable practices.

We cite this editorial extensively here because it closely matches our own reading of the broader literature. We had determined that top-down reforms that require enforcement were contrary to our goals and unlikely to work anyway. We therefore sought to incite reform through listening to and centering the voices of those who would benefit most from the changes we hoped would occur. Perhaps inevitably, we faced unexpected challenges and setbacks. We have encountered very few narratives about these types of missteps and difficulties and we found ourselves disproportionately discouraged.

Purpose

The three co-authors of this paper all engaged in reform efforts armed with what we felt were state-of-the-field approaches to reform. All three have sought out education and support from within and beyond the engineering education community, and all continue working daily to learn more. We assume that we are not unique or even unusual in the engineering education community.

The purpose of this paper is to contribute to community-wide discussions of reform efforts by sharing aspects of our own experiences that surprised us, but, in retrospect, seem likely to be common in this kind of work. Just as a would-be reformer needs to listen to the stories of the community, we believe it will be useful for the community to hear our stories. In particular we hope to lessen the potential discouragement others might feel when encountering challenges similar to ours. We seek to share some of those experiences that we felt were particularly challenging in order to normalize this part of the change process and to alleviate some of their demotivational power by making such narratives more commonplace.

Approach

We believe that these challenges are normal but underreported, and therefore seek to raise their prominence here. We choose to report on these challenges through first-person narratives of our experiences in order to center on the individuality of our experiences of the system. We developed these narratives individually first through journaling and reflection. In the course of writing this paper we have shared and reflected on our stories and identified common elements of our experiences.

Setting

Our university is currently restructuring the offices engaged with equal opportunity, social justice and diversity and will be requiring all faculty to work toward equity as part of their promotion and tenure assessments. Our college is involved in several multi-million dollar initiatives to address the underrepresentation and inequitable outcomes of certain student groups, and has recently rewritten its statement of goals to emphasize inclusion and increasing diversity. Our department is a change-leader in these college- and university-level efforts and is undergoing its own NSF-funded reform activities, one outcome of which is that nearly half of our faculty have gone participated in 60-hour trainings focused on inclusion, difference, equity, oppression and power. Within this department the three co-authors are deeply involved in social-justice-oriented change efforts. In other words, the important context for our stories is that we are actively working to educate ourselves and others within a university, college and department structure that explicitly values equity and inclusive social justice.

Results

We have three stories to share: Lorena writes about her experience as an undergraduate student experiencing microaggressions in a group explicitly designed to foster and model inclusive practices; Devlin writes about his experience as a faculty member trying to facilitate that group and address those microaggressions, and; Christina writes about her experience as a graduate student collecting and reporting her colleagues' negative experiences in a positive and productive way.

Lorena

The purpose of the project I was taking part in was to create and implement inclusive groups for students. These groups are intended to benefit students who feel excluded or uncertain in an unfamiliar environment. The group met for six weeks, and the first couple of weeks was focused on training us in matters of equity, diversity, and inclusion. The second half of our time was

committed to the implementation of pods throughout the school year. Below I have included four (slightly edited) entries from personal journals about my experiences. “Entry 1” was written immediately after a workshop day during the first few weeks, and “Entry 2” is from approximately a month later when we were developing the pods. Each entry is followed by a Reflection written some weeks later as I thought through my experiences with a broader perspective.

Entry 1

Today was the end of the first week of this project. I met a new member of our group that I hadn't talked to before, and some of (well, a lot) of the things that this person said made me feel frustrated because this person was thinking and speaking from a privileged point of view. They seemed to believe that their experience or perspective in life was the same as everyone else's, and that everyone should be treated accordingly. It made me feel invalidated, because they were essentially saying that people who do poorly in class – aka do not “excel,” should switch to another major.

It was particularly jarring because I think that the rest of the group had just spent a few days developing a shared agreement that GPA is not an accurate measurement of success in engineering, because a lot of engineers get decent jobs with low GPAs. Devlin helped me feel validated because he explained how the idea of a meritocracy is flawed and encourages the disenfranchisement of minority groups.

This person continued to express their opinions as if uninterrupted.

I think it will definitely be a challenge for our group to overcome over the next few weeks, hopefully [facilitator] will instill some empathy in this person.

Reflection 1:

I remember that I left that day feeling very frustrated and disappointed that our group had to back-pedal in order to catch this one person up to speed on what our values were. I know that there were some more superficial things that bothered me about the new person's communications that made me dislike them almost immediately, such as mentioning their age and number of credits in a way that implied that they would have “advice” for us based on their experiences. It is difficult to separate my reaction against what I perceive as bragging (which is annoying to me personally, but not necessarily something I would want to discuss with this group) from a concern about the person's blindness to their own privilege (which definitely should be discussed in this group). I have continued to grind my teeth throughout working on the project with this person, but have challenged myself to remain neutral when working with them.

I remember part of our workshop where we were challenged to recognize when we felt opposition towards someone and to ask ourselves why and what the source might be. I noticed that when certain people started to speak, I did what I consider “internal bristling.” I immediately started listening more closely, mentally combing their arguments for injustices and fallacies. I'd been hurt by their words before and decided that they were most likely speaking from ignorance rather than a desire to hurt me, and that made me all the more alert and attentive because I knew that they were more likely to say something else out of ignorance.

After this realization, I did my best to remain calm and neutral while listening, and I tried to listen more before I spoke. When employing these practices, I felt my internal tension ease somewhat. In a small-group meeting the previous week Devlin had referred to someone frustrating him as “a person deserving compassion.” I remembered the phrase because it was how I wanted students participating in our groups to feel about each other. I viewed this as a chance to practice and decided to try to follow these guidelines a little better.

Throughout the six weeks there were more statements that were ignorant, illogical or just plain annoying to me. Most of these problematic statements came from the same few people. Most often I tried to keep our meetings productive and positive by ignoring the comment and moving on. In some cases I even removed myself from the situation by moving to a different table or even leaving the room if necessary.

Entry 2:

I found it both extremely rewarding and frustrating to do this work. There were a few people who are just as headstrong as I am, which creates clash. But, then again, there are a lot of components to our project which require sensitivity, and I didn't think that these people did enough to be sensitive. We went through two weeks of training, and they still somehow don't get it.

It makes me feel helpless, and I'm not sure how to reconcile this helplessness with the more general helplessness I've been feeling for a long time. I feel like I'm a willing participant in a system that actively works against me. I feel like I will never be treated the same way as someone with a different gender/sexuality than me.

Reflection 2:

I wrote this paragraph during a summary presentation representing four weeks of our group's work. The presentation was being led by two male students, and my role had been subtly diminished until I felt left out. I saw that the power dynamics in our group had started to edge more towards the typical societal power dynamics: men speaking, leading, representing, while women were in the supporting role. My frustration shows through in the journal entry even though some of the stronger words have been removed.

Part of the frustration comes from not knowing how to make choices that will achieve my goals in this realm. I was absent on the day that the group decided who would lead the presentation, and even though the speakers gave the opportunity to the group for anyone else to speak, I didn't say anything. In light of the small clashes I'd had with the other “headstrong” people, it didn't seem appropriate. Also, I didn't want to be the person that volunteered for everything. At the same time, however, I constantly feel an obligation to take on more work because I can do it well, and I want people to see that a woman can fill the roles that men have typically filled until now. I still am not sure how to reconcile those pressures.

Devlin

I found myself responsible for starting and guiding the group of students Lorena discussed. In addition to planning how to establish these groups for other students, the working group functioned as pilot test where we attempted to enact the practices and achieve our goals.

My intent was to establish clear goals for the group and then focus on supporting the students' authority and autonomy. Based on past experience I assumed that it was impossible to design the authentic connections that would be required for this work, and that even if I knew how, doing so would be disconcertingly close to manipulation. I wanted to center the students' perspectives, but I also wanted to help them challenge those perspectives and incorporate scholarship about power, oppression and the social construction of difference.

A close colleague who is a gifted facilitator with expertise in teaching about power and privilege guided the students and I through weeks of reading, discussion and activities. Largely due to the intelligence and strength of the students themselves, the group did seem to grow into the mutually supportive safe space for critical reflection that we had hoped it would. My colleague's expert facilitation helped the group work through discussions of identity and privilege, and the students began intentionally making space for non-dominant parts of their identities: some students shared that they preferred different gender pronouns than we had been using, for example, while others became increasingly comfortable discussing their experiences with invisible disabilities.

In the first few weeks of our interactions, some students became uncomfortable in the group and felt that they were being silenced due to their identities as successful white males. Our discussions of our challenges in adapting to the perceived "engineer" identity felt exclusionary to students who identified strongly with that identity or were proud of their success in the program. At one point a student argued strongly that selectivity in engineering programs was good because it helped people who weren't suitable to be engineers find other careers. Drawing on the day's readings and discussion I excitedly pointed out that this statement was a great example of the meritocracy fallacy which I learned of from , [8], and that it assumed that people were born into skills and abilities, similar to a caste system. As Lorena has already noted, my arguments did not seem to have any effect on the student.

The student came to talk to me later, however, and I learned that my words had hurt them, and my enthusiasm was particularly hurtful because it felt like I was gleefully singling them and their ideas out for group ridicule. The student was involved in our activity because they truly cared about other students, and wanted to help. My response made them feel unwelcome and unvalued.

Clearly, I had made a mistake, but it wasn't immediately clear to me how to avoid making the same mistake again. I do tend to get excited when abstract ideas present themselves concretely (and at such a pedagogically appropriate moment!), and in some settings it is my job to address misconceptions. I had enough experience discussing privilege and power to know that it is not unusual for privileged people to feel attacked, or to need space to emotionally process the implications of their own privilege. I had even read about White Fragility [9], and how it can detract from discussions of systemic power and oppression by unproductively emphasizing micro-level concerns and again privileging the experiences of white people. As much as these articles and others had changed my own thinking, they were largely dismissed as irrelevant by the student. Near the end of a particularly intense, 90-minute conversation, our dialog condensed

to repetitions of our basic arguments. The student continued to participate, but they felt unwelcome and sometimes made other students feel that way.

The time came for our group to present our work to an advisory board including Deans, School heads and other faculty. We were all a little nervous about presenting, but two confident students stepped up and accepted the responsibility. During the work other students had naturally taken responsibility for different components of the work, and we decided that those students would help the presenters in crafting the slides and the presentation.

Later that week Lorena asked to meet and pointed out to me that our group had assigned two males to speak for us, and two females to “assist” them in creating the content of the presentation. I think my response at the time was a long silence capped with the unproductive insight, “this is a problem.” I was at a loss for what to do, and I decided that the time for productive action had passed. I let the presentation go as planned.

Christina

During the fall of the 2015 academic year, our School’s graduate degree programs underwent a program review. Within this review, graduate students were given a survey about the climate in our school. Items in this survey included graduate school experience, departmental advising and policy, graduate research and teaching assistant appointments, major advisors, postgraduate plans, professional development opportunities, and climate and culture in the school. While the overall tone of the survey and feedback was good, there were a couple of responses that suggested that graduate students were experiencing instances of racism, sexism, and not feeling welcome in the school. The School graduate student committee (GSC), the local chapter of ASEE, and other interested graduate students were invited to attend a presentation of the results from this survey from the school’s graduate student advisor. We were given the anonymous survey data, and ASEE and members of the GSC decided we were not satisfied with the negative responses. We wanted to provide nuance to the overall survey and to bring to light specific instances that were happening in the school. I had experienced instances of sexism and had been present when others had been targeted in other ways. These situations were always frustrating and at the time, I did not have the language, energy, or support to deal with them. I now felt that with the survey we had quantitative data to suggest that these things were happening. My experience was that faculty and administration would be more prone to acknowledge and respond to this kind of data.

During the same fall, our University held a speak-out for students to share their problems and experiences with the president of the university and the community. It was a powerful event and many in the University were surprised and appalled by the abuse and oppression students faced on our campus. We decided to build off of the momentum of this event and the grad school review by holding a School-level speak out the following spring. While we planned this event, one of the Graduate Student Committee (GSC) members brought to our attention additional problematic experiences that international students relayed to her in confidence. This further indicated to us that we needed to provide an opportunity for graduate students in our School to engage in a conversation of equity and inclusion as a larger community; we were already discussing instances between research group members and in study groups. We invited graduate

students in the school through email and word of mouth to come and talk about their experiences, labeling the event as a “grad student satisfaction discussion.” We thought that if we had been more explicit about the nature of the discussion we wanted to have students would not show up, and we had learned that many students didn’t understand what we meant when we talked about equity and inclusion. We explained the meeting as a way to have student voices heard in improving the grad program for current and future students. The email also gave graduate students the option to provide feedback through email if they were uncomfortable talking in a group discussion.

Around fifteen students showed up to our speak-out event (there are more than 100 graduate students in our School). We showed them the survey data and told them why we decided it was important to have this conversation. We then broke into 3 small groups that were facilitated by the organizers of the event. Prior to this event, we made sure each of the facilitators involved were comfortable having and navigating the topics and conversation that could result. Two of us were actively involved with initiatives on campus to educate ourselves on social justice issues and conversations. Another showed interest and had leadership experience. The group I facilitated consisted of two males and two females. The conversation started with how people felt about the lack of communication between the school and students, and that navigating the graduate student experiences wasn’t clear. I knew I wanted to get at deeper issues so I told a story about how I had experienced sexism in our school. When I told that story, the other students began to talk about other instances of sexism and overt racism they had experienced and the channels they went through to try and work through those problems. Toward the end of our conversation we decided that the school was not taking enough steps to ensure a safe space for all and that the channels to work through were unclear. Issues brought up by students seemed to “end up in the void” and there was no accountability or repercussions for faculty or other students. We had each group write down experiences or topics on index cards and we collected them at the end and reviewed them as a whole group. As organizers, we told the students that we would take these experiences and write an anonymized summary document to present to faculty and administration in our School.

We had collected specific examples of exclusion, frustration, lack of support and transparency, as well as overall concerns around safety within the school. Over several weeks, myself and another member of ASEE created a 5-page report summarizing the experiences and grouped them into two main themes: Expectations, and Community/ Belongingness. The process of writing this summary document was very cathartic for me and I felt empowered by those who were willing to share. I believed that this document would be a tipping point for change within the School and was excited to discuss how to move forward with other members of the GSC. We organized several meetings with GSC throughout the term. At each of these meetings, members of the GSC changed and the discussions rarely moved beyond a general introduction to the idea of inclusivity and why it would be important for graduate students in our School. Each time we met we had to bring everyone up to speed and often found ourselves having to defend some of the experiences, which wasted time and reinforced a culture of disbelief or ignorance. After two terms (more than 6 months) we were afraid of losing the “moment” surrounding the program

review so the two of us eventually decided we had to move forward without the support of the broader graduate student community. This was very discouraging.

As soon as this document was completed, we shared the report with those who contributed stories to member-check and make sure the report was accurate and anonymous. We decided not to include suggestions on how to improve the climate because we wanted there to be an open discussion between students, faculty, and administration on ways to improve so that everyone had buy in. We also didn't think it was fair to ask the students come up with solutions to the problems of a system that already felt distant and unsupportive to us. We sent the report to the school head in the hopes that a discussion would start among the administration, faculty, and students. Once it was out of our hands, we didn't hear much about it. This was in part due to poor communication between the organizers and who would take ownership of the document. The school head met with one of the organizers, who was not involved with writing the summary but was a facilitator at the event, and another administrator to discuss what the implications and next steps for the document were, and we met with other faculty to try to gain insight into the process and to learn how or if our report had been shared or addressed. As far as we know the report is currently "circulating," and no direct action has been taken.

Discussion

We hope that our stories connect with readers' experiences, reflections and discussions in multiple ways. Our own reflections and discussions have frequently led us back to the tension we felt between wanting to cause change and wanting to respect and value others' voices.

Each of us came to a point where we felt that our commitments to equity and inclusivity required us to organize people toward a shared goal. We each felt an internal conflict, however, between inclusively welcoming all voices and identities and the pragmatic needs for organization and clear communication. This conflict arose in two types of circumstances for us: first when we sought to directly challenge or change practices, and second when we tried to support underrepresented voices. These circumstances will be discussed in the following two paragraphs.

We all experienced an unexpected tension in addressing specific cases of injustice. For Lorena and Devlin the injustices were largely in the form of microaggressions, but even with these usually ephemeral events, the fact that our group existed as a kind of proof-of-concept of inclusive practices offered us time and opportunities to reflect and address them. Christina's injustices were more clear and general, but she experienced the same basic tensions as she considered the implications of her activism. Although we were all familiar with the concept, none of us was truly prepared to address well-intentioned oppression, especially not coming from trusted allies. Lorena and Devlin felt intuitively that it would be cruel to correct people precisely at the moment they sought to change themselves and their systems to be more inclusive and equitable. We sometimes felt paralyzed by the urge to unveil and reject every oppressive linguistic slip, and the equally powerful urge to nurture and support our groups' collective efforts. Our ever-present doubts as "headstrong" people or unexperienced facilitators seep in during this paralysis and encouraged inaction.

Secondly, we all sought to use a privileged position to give voice to some of those who were excluded. It is important to note that Lorena and Christina both earned their conditionally privileged positions through extraordinary effort and superior work while Devlin was granted privilege primarily due to his identity and position in the academy. Despite that important distinction all three of us felt hampered in our efforts to amplify others' voices by the concern that we might slip into speaking for people, effectively replacing their voices with ours. When Devlin observed a frustrating interaction between Lorena and another student, for example, it was never clear if it would be productive to intervene. Devlin was simply not privy to Lorena's experiences, and therefore never felt confident enough to disrupt potentially hurtful practices. This tension is most visible in Christina's efforts to collect graduate students' experiences in their own words without co-opting their stories or betraying confidences.

For us, these confusing tensions and paralyzing conflicts arose because of how we conceptualized what we were doing. In our stories we see ourselves striving to cause change without exerting oppressive power. Perhaps most obviously in Devlin's case, we sought to cause change without ever (overtly) directing another person's actions or thoughts. We were challenged by circumstances that seemed to require our direct intervention, however, and that is why we started the process that resulted in this paper. In our discussions we have learned that our association between direct intervention and oppressive control is false and counterproductive. By broadly characterizing any act of leadership, direction, management or supervision as oppressive acts of power we denied ourselves some much needed tools. We hindered our own work by not allowing ourselves certain practices. Indeed we limited ourselves in some ways to self-centered thinking. For Lorena, for example, the question "should something be said," is clearer than the question "should I say something." The first phrasing assumes a position of leadership, but it also centers the question on the group or community. Although we tend to associate "leading" with control or dominance, the framework of leadership actually helps us think beyond ourselves and focus on the good of those around us

As we move through our developing understandings of inclusivity, power and equity we necessarily also move through successive revelations of the punishing and pervasive oppressions of our social systems. We become increasingly aware of the birdcages [10] and cruelty [11] and perhaps begin to associate authority with control. Simultaneously, by studying inclusivity, equity and power in educational systems we found ourselves in the position of asking people to change. Some changes seem small (e.g. asking someone to edit their vocabulary by adding or removing a word or phrase), and some seem larger (e.g. asking a School to establish policies to enforce an inclusive culture for graduate students) but the common element is that we are working to get people to align to our vision.

Recommendations

We have three recommendations for people in engineering education who are beginning to engage in social justice reform.

Take action where you can and expect and accept mistakes

A primary inspiration for this paper was that we felt unprepared for the particular challenges we encountered. We found ourselves in these positions because we were attempting to do

something that needed to be done. We obviously thought we were capable of the tasks, but, importantly, we did not view ourselves as experts or well-trained change agents. Frustratingly, we were able to find better alternatives to our choices after a quick literature review or discussion with a colleague. In this context our mistakes sometimes felt like devastating evidence of our fundamental unsuitness for social justice reform. Engaging is risky and the more you attempt the more visible and broadly shared the risks become.

The alternative, however, is to not take action until we believe ourselves capable of perfect action in unpredictable circumstances. We expect that this hesitancy may be particularly strong in people who are trained as or identify as engineers: in many engineering disciplines making decisions without adequate training or experience is explicitly codified as unethical. We argue that this binary distinction (adequate versus inadequate, capable versus incapable) is counterproductive because it prevents engagement. The concept of Freirean praxis [12] is helpful for us because it is a synthesis of reflection and action, but is distinct from them. By focusing on praxis as the intersection between what we know theoretically and what we are able to do within our social realities we can find opportunities to contribute to social justice without risking too much, too soon.

Develop and maintain a transparent path to realizing both broad and specific goals

In our stories we see ourselves struggling to work toward many goals: broad programmatic reform, increased community awareness of identities and experiences, personal growth, resources and support for marginalized or disenfranchised students, as well as our personal ethical commitments outlining who we want to be as professionals. These goals were then applied to a multitude of tasks including teaching, listening, recording, and reporting. Accepting the fundamental “messiness” of social systems, we sought to hold all these goals in readiness to be applied when the opportunities arose. We found ourselves juggling and shuffling through these goals in many situations, and were often confused and dissatisfied with our results.

We recommend taking the time to intentionally arrange your many goals and planned actions into some kind of logic map or network with particular attention paid to how they augment or limit each other. In particular we found that careful, slow reflection (i.e. writing or drawing as opposed to thinking or discussing) helped guide our actions around the complex balance of self-care and valuable work. Of course you cannot predict all situations or fix your goals permanently, but committing to an expectation enables more productive, coherent and intentional flexibility in “messy” social settings.

Work against complicit silences

Engineering and engineering culture are particularly circumscribed by a need to be objective, neutral and apolitical [8]. In our stories we found ourselves silent or inactive (partly, as discussed in the first recommendation, due to an inability to find the “right” thing to say or do). For example we might lose the opportunity to respond to a microaggression while we consider the best way to do it. In this example the cost of not saying something is clear – the people affected by the microaggression experience us accepting it and thereby contributing to it. We recognize that each social situation is unique and therefore no blanket admonishment to “say something” is productive. Instead, our recommendation is to work to find ways to say more, or

more often. The pressures to not speak or not broach uncomfortable topics is well-established and pervasive, and requires an equally persistent counter force. We know abstractly that reform takes effort, but we found that we needed to focus and prioritize the basic act of speaking up in order to balance out our ingrained cultural resistance to it.

Acknowledgements

This material is based upon work supported by the National Science Foundation under Grant No. 1519467. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

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