



Campaign among Engineering Educators

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Reflecting on #EngineersShowUp: Outcomes and Lessons from Organizing a Campaign among Engineering Educators

Abstract

In an open dialogue format, participants and organizers of #EngineersShowUp report on the organizing work, actions, discourse, and reflections emerging from an NSF-funded week of action campaign that occurred from February 23rd - 29th, 2020. Participants helping to organize and take part included students, faculty, administrators, postdoctoral researchers and others connected to the world of engineering education. The intention of this week of action (directly following E-Week) was three fold. First, we aimed to test approaches from social movements and assess their promise for change in engineering education. Second, we sought to deepen conversations around power, privilege, and a critical perspective on Diversity, Equity, and Inclusion (DEI). This entailed challenging current conversations taking place around DEI, and taking time to think about our roles as ally, advocate, or accomplice with groups and people who may not have been at the table previously. Our third intention was to invite the community to take action; to move engineers toward disrupting the status quo that maintains systems of power and privilege and rethinking how engineering education is shaped by and in turn shapes dominant logics of oppression such as white supremacy, colonialism, racism, and sexism. This paper reviews the social movement organizing theories employed and the networks engaged both inside and outside of engineering in order to achieve these goals. We then provide details regarding our organizing practices and the specific activities that participants engaged in during the week of action. Finally, we will share reflections on lessons learned about the process and its outcomes, with the expectation that conversation and feedback received from the broader engineering education community will inform recurring efforts in this domain, and grow participation in a social movement approach to change in engineering education.

Introduction

The #EngineersShowUp campaign is organized as part of the Relational Organizing/Action Research (ROAR) project, which explores the utility of movement organizing toward achieving two goals: (1) changing rewards structures so that they value engineering education research contributions; and (2) enacting radical structural change that enhances diversity, inclusion, and equity. The first part of the work for this project involved relational interviews through which participants who wanted to take part in the campaign shared their issues and hopes for change within engineering education. A deeper analysis of these relational interviews can be found in a paper previously presented at ASEE [1]. The results of that research pointed to a need for change in reward structures, the need for social infrastructure that provides support systems for those critically engaged in engineering education research, and for the further deepening of relationships that currently exist at a distance.

Out of these interviews and their analysis, we moved toward the next steps, which were to use social movement strategies and theories as a mode for identifying and enacting interventions toward radical structural change. This involved large-scale conference calls with and among participants, thinking together about various actions, sharing resources, and connecting with existing groups and networks. During the first call, participants discussed the idea of staging a

“week of action” around which engineering educators, students, staff, and administrators could teach lessons, stage sit-ins, hold panels, and create a social media campaign to build awareness, develop resources, and grow an extended national network of support and collaboration.

Background

This call to a week of action builds on prior work in engineering education, including the work of minority and women in engineering programs, and the work of professional societies focused on diversity, equity, and inclusion. [2-4]. In the 1950s through the 1970s, movements in engineering centered on identity, equality of opportunity, and equity in recognition. For example, in 1950, the Society of Women Engineers (SWE) formed as a society for networking and support, galvanizing a wave of women who joined the engineering workforce in World War II. The National Society for Black Engineers (NSBE) formed in 1975, when 6 black engineering students on the Purdue University campus hosted a national meeting of campus groups formed to support black engineering students. Bolstered by the American Civil Rights movement, women’s liberation, *El Movimiento*, the American Indian Movement, and other organizing efforts, engineers formed organizations like these as well as WEPAN, NAMEPA, the American Indian Science and Engineering Society (AISES), the Society for Hispanic Professional Engineers, and others.

Other organizing movements sought to shift the very structure of engineering practice. For example, Kelly Moore’s work on the group Science for the People [5] to disrupt scientific practice tied to the military. Matt Wisnioski’s work on Engineers for Change [6] focuses on dissident engineers at MIT and elsewhere in the 1960s, who critiqued their profession and its connections to military and industry, often using the work of critical theorists, such as Jacques Ellul, to do so. However, Wisnioski formulates this movement as part failure in that it was co-opted by the dominant engineering discourse to shape our current understanding of technology as the driver of historical change and push for more and faster development at all costs. Moore’s research on Science for the People, which included engineers, documents how they organized to do research and work specifically in pursuit of the public good, social justice, and equity. Moore argues that they succeeded in changing mindsets about what science and engineering is and what it can do for society.

A more recent, engineering-specific instantiation of this type of movement, is the Engineering, Social Justice, and Peace network. [7] While seeds of the idea for this group came from Baillie questioning Canadian engineering practices and focuses on engineering towards profit (as opposed to for public good), it was fostered by university resources from a supportive Dean to host an engineering and social justice meeting in 2004. Catalano, one of the attendees, took on hosting the next meeting, and from there it became an aggregation and collectively collaborative effort amongst many engineers and engineering educators interested in changing engineering practice away from military and industry and towards social justice and peace endeavors. These efforts have included the creation of an international journal, a book series, annual meetings, workshops, and a community of practice that creates and shares lesson modules for engineering classrooms that shift the discourse to issues of equity, peace and social justice. Related work from members of the ESJP network includes the design for social justice initiative [8], and work by faculty at Colorado School of Mines bringing sociotechnical critique into engineering classrooms [9]. The intention of the ESJP network has been toward systemic change, deepening

relationships (rather than growing numbers), and creating a heterogeneous network of interdisciplinary scholars interested in radical change.

In line with the Engineering, Social Justice and Peace network, the first Peace Engineering program was founded at Drexel University in the fall of 2018. This program focuses on non-violent critical engineering engagement. It is “the nation's first program dedicated to preventing and reducing violent conflict through education and research that integrates innovative technologies, approaches, and policies with the studies and practices of peacebuilders.” [10] It refocuses the goal of engineering research from profit and military developments toward conditions of peace, expanding the very ways in which engineering is defined. Similarly, the re-engineered project, led by Darshan Karwat, is an interdisciplinary working group focused on bringing design thinking and social science skills to bear on engineering, with a focus on projects such as divestment from oil toward other energy strategies. [11] Other more recent instantiations of social movements within engineering include social media movements and campaigns in engineering such as #ILookLikeanEngineer [12]

Building on the legacies of all of these movements and in conversation with present-day members, a specific goal in this week of action was to demonstrate that questions of systemic oppression could be brought into *every* engineering classroom setting – because they *belong* there. We invited participants to share or create modules in this regard, and to take a risk and try them out on their campus. We focused not only on issues of identity and creating networks for those on the margins, but also on the long-term goal of institutional and structural change at scale. With this in mind, then, the creation of lesson modules, thinking together about shifts in pedagogical practices, and social media campaigns –all happen against a backdrop of root cause analysis that frames issues of inequity in engineering education and practice as connected with racism, classism, sexism, ableism, homophobia, and other wider forms of oppression in society. Our work is inextricably, connected with organizing movements and strategies outside the realm of engineering.

More specifically, this project and week of action builds on efforts outside of engineering education including work by Myles Horton [13] and the Highlander Center for Research and Education [14], rooted in Horton's principles of popular education. One of the key principles of the Highlander Center are to identify root causes of issues, and work on these systemic issues in consistent and generative ways instead of focusing on *problems* (e.g., not enough women in engineering). The outcome of this shift is that instead of focusing on getting more women acclimated to the system of engineering education and practice, we can identify the root cause of sexism, and ask what measures could be taken to combat sexism in the world of engineering education and practice. This framing clearly would connect us to others working on issues of sexism in engineering and in other contexts, with whom we could learn and collaborate. The organizers engaged studied, or collaborated with groups including Showing up for Racial Justice (SURJ), Organizing White Men for Collective Liberation (OWMCL), The National Association of Multicultural Engineering Program Advocates (NAMEPA), ASEE's Committee on Diversity Equity & Inclusion (CDEI), and the Women in Engineering ProActive Network (WEPAN). We reached out to groups and people for getting involved in the week of action via Twitter, LinkedIn, through various Listservs, as well as via personal communication.

Organizing for the Week of Action: Successes, Failures, and Findings

In the 7 months leading up to the proposed week of action, participants met regularly (about two times per month), to discuss planning events at various campuses; developing and sharing resources and promotional materials; framing the initiative and its intentions; and delegating tasks for smaller working groups. All of the resources developed or gathered were shared on the website www.engineersshowup.org, which grew iteratively to accommodate new information including: living list of resources, partnering organizations, suggested actions for taking part, listings of events organized specifically for that week and beyond, and national organizations with whom to connect for any individual interested in deepening networks. Along with the website, a google group and a LinkedIn page were created.

Materials developed before the week of action included lesson modules on various themes and topics: general awareness-building around issues of privilege and equity in engineering, the incarceration-industrial complex, climate change and environmental justice, and more. Difficulty level and length of time needed for the various lesson modules were shared as well as readings, in-class activities, discussion questions, and sometimes fully developed PowerPoints for the classroom. Resources for facilitating an informal meeting group outside the classroom setting that students, staff, or interdisciplinary faculty might want to engage were also developed and shared. This activity included a few readings from Alice Pawley [15] with questions and a specific discussion structure for different lengths of time.

One of the smaller working groups focused on developing branding, hashtags and posters for campus distribution in order to foment a social media campaign. The hashtags #EngineersShowUp and #EngineersDisrupt, were used to point to specific actions during the week, or ongoing work that was in line with the campaigns intention to focus on root causes and issues of systemic oppression within the very framework of engineering education. On the website, we shared sample tweets and ways in which to engage the hashtags so as to lessen the barrier of engagement. The group also wrote and shared a general email script for spreading the word about the week of action. .

During the organizing efforts leading up the week of action, participants grappled with framing questions, the level and content of resources, and lowering the barrier of engagement, while also acknowledging the depth of the struggle to foment structural and systemic change. Many participants felt it was not enough just to have one lesson module about privilege taught during a whole semester term or in the whole of an engineering education. Thus, it was suggested that we carefully frame expected outcomes, making clear that these modules should be a way to open up dialogue and start the process toward continuing conversations – and one lesson plan is not the end to the effort. There was also a shared concern that if the lesson module fell flat, if students did not engage the material, or if the lesson module did not spark conversation and shift minds, that the teacher needed to be reassured and encouraged to persist in their efforts, learning from the experience and improving over time in collaboration with others. In response to participants' suggestions, a disclaimer was added to the page of lesson module examples. We have also given space for feedback about the website materials in order to help in processing such issues, which could lead to reflection of what worked or did not.

A large part of the organizing around these resource developments and framings was a continuation of the relational aspect of the project and getting to know one another. This was followed through with the ideation and then cultivation of Joyful Activism meetings, starting all of our organizational meetings checking in with participants about their feelings and where they were at, as well as creating a dynamic and space where everyone could speak openly about the work they were taking on and how the project was progressing. Participants shared music playlists, moments with children and pets, and other aspects of their lives. As trust grew in the group, we were able to have some frank and reflexive conversations about the inequitable structures we ourselves were laboring under. Grant funds could be used for this purpose and not that; some participants engaged as volunteers while others as paid personnel. Our positions in academia included tenured faculty, staff, graduate students, and postdocs, with differing levels of compensation and precarity. By design, the project continues with ongoing conversations, building on the prior organizing work and the week of action. It is clear we would not be able to solve the systemic issues in the short term, but we were able to name structures, root causes, and start to build extended networks of support and resources for enacting change moving forward.

What happened during the week of action?

During the week of action, we saw the uptake of the #EngineersShowUp and #EngineersDisrupt hashtags by individual faculty, staff, administrators, by the ASEE CDEI, and by various institutions and engineering education programs. We also used the hashtag to highlight the work of practicing engineers whose work we felt reflected the #EngineersShowUp initiative and purpose. This involved retweeting as well as generating our own content. An example of a retweet is a story posted about Nora Paul-Schulz, an engineer and high-school teacher, who is part of the Boston Union “Unafraid Educators” which supports immigrant students and their families [16]. She currently works on a campaign that targets egregious misconducts in privacy currently occurring as school police officers’ reports are being made available to federal law enforcement. We also tweeted about an alternative job fair organized by students at Rensselaer Polytechnic Institute during Engineering Week (E-Week), the week prior to our own week of action. For this event, organizers invited companies committed to ethical practices onto the campus, giving students an opportunity to find alternative pathways in engineering that align better with their equity and justice commitments.

We pointed to and promoted events that happened specifically in response to the #EngineersShowUp call as part of the week of action. Online, Briana Benedict and other members of the CDEI PD Virtual Workshop Team hosted the presentation and discussion **Engineers Show Up: Let’s Talk About Allyship**, attended by approximately twenty participants. This particular event took to heart one of our main aims: cultivating strategies and tactics for support to those not included in most engineering practices or education endeavors. It challenged us as engineering education practitioners to cultivate solidarity and deepen our commitments as advocates and accomplices. Benedict also brought up the important point that this should not only be a week of action, but a continuing conversation and work in progress to transform our practices, pedagogy, and everyday lives within engineering education. Justin C. Major of Purdue University offered an exercise for thinking about socioeconomic exploitation in the engineering education research enterprise [17]. At Michigan State University, Logan Williams held an Anti-Oppressive Engineering Workplace Guided Visualization Exercise, which

she also made available for later use [18]. Meagan Pollock led a twitter chat sponsored by ASEE with guest hosts Stephanie Adams, Brianna Benedict, and Jacqueline El-Sayed. Approximately twenty participants reflected on and responded to questions from Pollock regarding how it might look and feel for engineers to confront power and inequity embedded in the systems and structures in which we act. The intention is for this to be a continuing series of discussions under the #EngineersShowUp banner. Again, these are just a few of the things that occurred online and were shared via Twitter.

Offline, various events were organized at campuses across the United States. At Drexel, a panel specifically organized for #EngineersShowUp brought together interdisciplinary scholars (across History, Sociology, and Peace Engineering), administrators, and activists to discuss relations of power in engineering work that engages communities at risk. The main points from the panel were also summarized on Twitter. Activities at the University of Oklahoma included a student protest against a Civil War hero statue as well as a talk by Dr. Robin Zape-tah-hol-ah Minthorn on “Centering an Indigenous Leadership Perspective.” This talk and its main points were also summarized on Twitter and retweeted by our account. At Boise State University, founder of Station1, Dr. Christine Ortiz, led a workshop on socially-directed STEM toward rethinking education systemically to center equity.

Many activities also occurred in classroom settings. For example, Andrea Haverkamp brought various lessons into her classrooms at Oregon State, and at Bucknell Margot Vigeant brought a discussion of equity and social justice to her thermodynamics class. Her twitter thread reflecting on that experience demonstrates both the feasibility and importance of bringing these discussions into *all* engineering classrooms [19].

Via our LinkedIn group, participants shared activities they were planning for the week with students, as well as examples of engineers showing up in different ways – including engineering students protesting of the tenure denial of a Latina professor engaged in humanitarian engineering work. Andrea Haverkamp shared valuable resources on being an accomplice and organizing for racial justice, which we also hosted on the resource page of our website.

Reflections and Lessons Learned

While assessing the full efficacy for social movement strategies to enact change at scale in engineering education may take a longer observation time (possibly over several years of resource and network building and several iterations of campaigns), we have identified some connections and promising shifts that speak to the possibility for relational organizing as informed by root cause analysis. One outcome of this organizing work is that we were able to bring together many other already established networks and groups. We cultivated relationships of allyship and advocacy with NAMEPA, WEPAN, OWMCL, SURJ, and the CDEI as well as various other groups and institutional communities. Breaking down silos and working towards conversations across diverse disciplines (such as Science and Technology Studies or History of Engineering/Technology) and diverse actors (community environmental justice advocates, students, faculty, and administrators) are some other wins that we have seen developing through this project. Hopefully with time and continuing conversations, these can develop as deeper relationships and conversations targeting root causes underlying issues of common concern.

Building power across these diverse actors' and organizations' different expertise, resources, and angles at which to intervene.

We had some promising gains in our goal to deepen conversations around power, privilege and cultivating a critical perspective. One generative route is to bring various groups with similar goals together in order to strengthen change efforts. This meant pooling resources among scholars, activists, students, and administrators already doing hard work within engineering education with groups like ESJP, NAMEPA, the ASEE CDEI, WEPAN, as well as those outside of engineering education who were happy to share advice and resources, such as Organizing White Men for Collective Liberation (OWCL), who even shared our calls for action in their monthly newsletter. This group also dedicated time to meet with us remotely to brainstorm strategies and actions for cultivating engagement and holding space for difficult discussions regarding power dynamics tied to race and gender identities – something with which they were well-versed.

Another very important aspect of this work, which has been emphasized by staff and graduate school participants, is the relational aspect of organizing and movement-minded projects. Participants who had experiences in other social justice or activist circles outside of academia shared how some other movements they were part of fell apart because people did not take the time to get to know one another, to learn how to relate, and to accept difference and move forward with a generous mindset about where people are at in their awareness or standpoint regarding the issues we have identified that need to shift. This perspective was helpful in our organizing thus far, and will be helpful moving forward, as organizers and participants in #EngineersShowUp are very aware that the hardest aspect of this work may be to open up dialogue with those who do not think these issues need addressing at the systemic or institutional level. By moving through these actions with generosity and openness, we may be able to deepen connections toward shifting mindsets and enacting change. This attention to strengthening networks and building across difference (connecting heterogeneous networks) ties to Adrienne Maree Brown's work on Emergent Strategies for movement building [20]. Her own work as an organizer in Detroit has led her to make connections of emergence and network building that is predicated on deepening relationships and connecting diverse groups who might share similar goals. In building on the strengths of existing organizations, we can connect them strategically to achieve common goals. We found that emphasizing the relational organizing aspect of the work, focusing on the ecology of networks and how they might sustain each other toward enacting change, has been a foundational lesson we will take forward into future organizing efforts.

Some other lessons come via our own experiences trying to make something happen in a system that does not value organizing work to shift oppressive dynamics. It has included difficult conversations about compensation, reward-structures, and the immense expectations put upon graduate students or untenured faculty, as discussed above. We confronted the unevenness of reward structures on the grant that is funding this work, searched for ways to have such labor recognized and compensated, and acknowledged the immense pressures put upon graduate students to help and volunteer their time while existing in high levels of precarity. We have reflected on our own positionalities within this, what we are accountable to changing, and how the system structures our own commitments and capacity to work on things we hold important and dear. Future grant-writing will require new creativity to work around institutional barriers, for example, a hard restriction on paying graduate students employed at other institutions.

In this same moment, we have also landed upon the importance of joy and pleasure within activism and for sustaining these actions and the continuing work we hope to put forth in the world. Parallel to organizing meetings regarding the creation of content and imagining this project, we have started to hold Joyful Activism meetings (via the suggestion of Andrea Haverkamp). Most importantly, these meetings fold back into the relational organizing aspect of the project and thus involve getting to know one another, relationship-building conversations, and sharing what sustains us as well as tactics for grounding and establishing self as well as collective care. While there are general prompts or questions brought to the table for the Joyful Activism meetings, there is no requirement or set agenda, and conversations are open-ended, ranging from topics of comfort foods that we make, physical and action-oriented hobbies we take part in, and creative endeavors that feed our souls.

Conclusion

In summary, we return to our specific aims, what happened, and what did not:

First, we aimed to test approaches from social movements and assess their promise for change in engineering education. This involved evaluating previous movements in engineering and STEM that organized for change within Engineering and Science practice. We also took organizing tactics from other social movements outside of this realm, specifically the Highlander Center theory of change and Alinskian relational organizing as the grounding for our own work. Keeping with the relational tactic, getting to know one another personally and our various positionalities, in the struggle to enact change proved very productive and important in our continuing work to organize – before, during, and after the week of action. We also found that focusing on root issues provided fertile ground upon which to critique and work together to brainstorm and target small actions that could build up to greater changes at scale. Focusing on a networking across established groups and communities rather than starting from ground zero and reinventing various infrastructures and networks. This also allowed for a deepening of relationships that continues to prove important in the work towards enacting change.

Second, we sought to deepen conversations around power, privilege, and a critical perspective on Diversity, Equity, and Inclusion (DEI). This entailed challenging current conversations taking place around DEI, and taking time to think about allyship and advocacy for groups and people who may not have been at the table previously. Building off the tactics and strategies taken from our first aim, this goal followed organically as we identified and engaged various groups and networks, as well as deepened conversations amongst allies and accomplices. We identified ways to move beyond surface conversations, engage various positionalities and complicity with oppression, and helped develop lesson modules and informal workshop conversations to breach these issues. We identified and pointed to those already working in the field who are doing the hard work of cultivating these deeper conversations and speaking truth to power in engineering education (as identified and highlighted in the projects promoted via our Twitter account and on our website).

Our third intention was to invite the community to take action; to move engineers toward disrupting the status quo that maintains systems of power and privilege and rethinking how engineering education is shaped by and in turn shapes dominant logics of oppression such as white supremacy, colonialism, racism, and sexism. This culminated in the week of action, which we detailed as a moment in which engineering educators and practitioners could take action as well as acknowledge ongoing projects in this regard. However, we also asked for participants to

continue actions and conversations beyond the week of action – to use it as a starting point from which we can grow. This third aim will continue to be a process and ongoing outcome that we will evaluate and work to facilitate beyond the scope of this paper.

Looking ahead, we seek to continue to amplify the work of others while deepening our analysis of root causes, emphasizing the importance of keeping joy and care at the center of what we do together. We seek to hold space for reflection, journaling, and creative response, encouraging faculty and administrators to focus on experiences of students, staff, and others in more precarious positions in the academy. Convening both virtually and in person to document, process, and share both our analysis and our feelings, in the hopes of building relationship, networks, and a stronger movement toward engineering that embraces diversity, inclusion, justice, and liberation.

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