Journal Entry, July 2020: Affirmation, Inclusion, Equity and Everyone by Lauren Thomas Quigley (she/her, laurendt@uw.edu, University of Washington), Monica Cox (she/her, monicafcox@gmail.com, STEMinent LLC/Ohio State University) Cynthia J. Atman (she/her, atman@uw.edu), Jennifer Turns (she/her jturns@uw.edu)

When we reflect on 2020, especially in the United States, the divides in society amplified by the pandemic and laid bare for all to see following the murder of George Floyd in Minnesota in May, 2020 will most likely be the top of mind. We could all see this nation's history and current complicity for racism, both the systematic and systemic. The moment was not unfamiliar, but markedly different. Initially, we wrote this piece in the summer of 2020, in response to our professional organization's delay and hesitancy to affirm Black lives, Black students, Black engineers and Black faculty. Many of us were crying out. Allies with commitment to action showed up for and with us -- no questions asked, to ensure that what we felt was at least heard. In nearly a year since our original effort to write this piece together, some things have changed for the better. We saw our professional organization affirm Black lives. We saw some of our colleagues take action, change course and use their influence to make the community better. Some learned, listened and tried to do something new. Others, either remained silent, hopefully in contemplation, but some with a silence that convinces us that they are simply not on the same side.

We composed the below entries in the summer of 2020, amid national turbulence and internal reflection. Below we provide four personal stories and some specific calls to action situated in the summer of 2020, but these remain our aspirations and hopes for the field of engineering education.

As engineers and educators in the US, in every corner of our public and private lives something was being said about this wave of the 400-year movement for Black Lives -- and in the case of many, including American Society of Engineering Education (ASEE) at the very beginning, not enough was said. This piece came about as we individually experienced this and chose to come together to discuss it with the engineering education community. Our experiences as individuals, consumption and contribution to research and practice in engineering education and candid discussions with each other as Black women (Lauren and Monica) and White women (Cindy and Jennifer) became a method, similar to that of the researchers of *Unlikely Allies in the Academy* (Dace 2012) . We joined to have a discussion about our field, the issue of equity in engineering education and make recommendations for methodical actions to restructure engineering education to demonstrate value of Black and marginalized lives in order to progress intentionally to becoming an equitable, beloved community.

Our aim is to add to the discussion and work of our many colleagues who lead research on the inclusion and diversity in engineering (Pawley 2013, Pawley 2017, Riley 2014, Lee 2019, London et. al 2020, Foor 2007, Byrd, Dyka and Ramalal 2013) and practitioners who are oft under published who work within colleges and universities as administrators and professional staff changing systems, faculty and supporting students (Landis 1988, Anderson-Rowland 2010, NAMEPA 2020) . These researchers and professionals provide a necessary vantage point on the need and methods to diversify engineering, the experiences of marginalized people in engineering and the impact that the exclusion of some voices and perspectives in engineering has on

individuals, communities and the discipline. Equity, inclusion and rightful presence are socio-political ideals that require the capital of researchers, practitioners and humanists who are compelled to activism because we recognize the threats to human rights particularly those of Black, Indigenous, Latinx, and LGBTQ people that are amplified or otherwise exacerbated in engineering education, practice and tangible engineering innovations. The refusal to tolerate these injustices leads the community of the committed to pursue the cultural and systemic change our discipline needs.

Lauren Thomas: The power of affirmation

The psychological effects of witnessing a lynching on Black Americans are well documented to include anxiety, depression, individual and inherited post-traumatic stress response and even anticipatory grief due to the renewed awareness that there is seemingly nothing to protect you. That is where I was mentally when reading the American Society for Engineering Education's (ASEE) original statement (2020). It was a feeling of renewed anxiety brought on from exclusion and a reminder of the intellectual traumas of my experiences in Engineering Education. It was no surprise that the statement fell short. At no point in the statement were Black lives affirmed. At no point was my life affirmed. I came into the discipline with a strong identity as a Black woman in America. My upbringing and experiences at two Historically Black Colleges and Universities (HBCUs) equipped me with theoretical knowledge and research about the Black experience both in America and the diaspora. As an identity researcher, I was aware that I sought identity through affiliation with this discipline, even when acceptance was not reciprocated. Challenges aside, I reached out to trusted friends in the field, because I had nothing to lose. My career shifted away from full-time academia, even though my attachment to engineering education intellectually and the alignment of its practical work with my own life's goals are fully aligned. There is no rationale for concealing that the list of systemic actions mentioned are in part, born out of my own story in the discipline. Sharing that story is something I've only done with a few, including each of my co-authors for this piece with whom I learned to navigate the field and actively protested for Black lives with.

Cindy Atman: Casting a wide net

"Where you sit is where you stand" (modified version of Mile's Law). When I went to graduate school in 1986 I put a copy of this quote on my desk, my mirror, the dashboard of my car. My intent was to remind myself to assess, on an ongoing basis, if I was staying consistent with my internal sense of ethics and commitment to larger issues of social justice. I got my PhD in the Department of Engineering and Public Policy at Carnegie Mellon University. While the department was an interdisciplinary space, I was keenly aware that I was attending a university that was largely defined by engineering and technology (the arts as well, but predominantly technology). I was also aware that, as a human, it is easy to adopt the values of your surroundings. As I started my degree, I wanted to put into place a process, a reflection opportunity, to ensure that if I was changing my stance, I was doing it knowingly. It turns out that in the research I engaged in we dove deeply into behavioral decision theory (in contrast to decision theory), and understanding lay peoples' mental models of risk communication. It was a program that respected the human experience and resonated with my perspective on the world. So thankfully, where I sat was an appropriate place for me to be based on where I stood.

Why do I bring this up in a written piece on race in the field of engineering education? Because the events of 2020 made me realize that, as a white person, I have not been casting my net wide enough when I consider "where I sit". As I learn more about the breadth and depth of the

systemic oppression of people of color in the U.S., it is also important that I acknowledge that I have benefited from it. Being white brings affordances of privilege. Where I stand now was built on sitting in that system of oppression. This realization is devastating to me. So now what. If I am to remain true to the ethics that I claim to hold, I need to be dedicated to working at the level of systematic change in addition to working at the interpersonal level (Ijeoma Oluo, 2019). I believe that at this moment, silence at the systemic level is equal to condoning the continuation of systemic racism and oppression that I continue to benefit from. In my world of work, which is engineering education research and teaching, that means a reflection of my personal actions, and making a commitment to changing them where they need to be changed at both the individual and institutional level, in my classroom, my research and my service endeavors. And then it means taking action, and reflection to assess how I am doing. To change the system will take concerted effort on all of our parts. Another quote that has been an anchor for me for some time is “The arc of the moral universe is long, but it bends towards justice” (Theodore Parker). The thing is, it only bends if we do the hard work of doing the bending. Now is the time to do some bending.

Monica Cox: Wanting equity

“Although I have garnered numerous awards and been validated for being a good academic citizen, I’m somewhat ashamed to admit that being a woman of color in the academy has taught me to be bound by what others think about me and by the access that (I think) people in power can and cannot give me as an academician...Each of these activities freed me from having to apologize for being a woman of color in the academy and from being different. They freed me from having to explain myself and for not fitting in a pre-defined box about what it means to be an academician or to be successful in the academy. (Cox, 2017)”

I wrote this blog post on July 30, 2015. Like Civil Rights activist Fannie Lou Hamer, I had become sick and tired of being sick and tired. My Prepared to Be a Pioneer® blog had become my sanctuary, the online place where I could express myself and could regain the power that I thought that I had lost as a tenured faculty member.

Long before Margot Lee Shetterly’s 2016 bestseller, *Hidden Figures*, garnered global attention, I had shared on my personal website my firsthand experience of being a Black woman mathematician, engineer, and educator at one of the top engineering institutions in the world. While Shetterly’s book chronicled the history, lives, career trajectories, accomplishments, and challenges of several Black female mathematicians and “computers” who demonstrated technical excellence at the National Aeronautics and Space Administration (NASA) during the mid-20th century, my personal blog presented a narrative written through my eyes, presenting the highs and the lows of being the first Black woman professor to earn tenure in a College of Engineering that had boasted alumni who were the first and the last men to travel and walk on the moon.

Working as a Black woman in the engineering education field has been a lonely journey, not because I cannot or do not want to engage with others, but because I have found myself in the seat of a cultural educator more than I anticipated. Although many engineering educators are willing to engage in difficult conversations, others are defensive or are in denial about issues plaguing our field. At the end of the day, what I want is equity. I want to be paid what I am worth. I want to sit at a table and have my voice heard, not only because I am a Black woman, but because I have something valuable to say. I want life to be better for Black women in engineering who will come after me. It is time to change our narrative into one where we do not

have to assimilate to succeed but are accepted for what we authentically bring to our engineering environments.

Jennifer Turns: Enlisting everyone

As a White woman who was raised not to make trouble, but whose career led to troublesome topics in engineering, like the human side, design, education and reflection I was led to the understanding of existing trouble. Those troubles are problems, and engineers fix problems, however when engineers are drawn to action, a lot of othering tends to take place. Those other individuals need to change and those efforts to go after the “thing” that will “fix” the “problem” but are in reality insulating ourselves from what we can do within our spheres of influence and control. We deny our own power or justify our lack of power to change in sites closer to our daily activity because our jobs are too complicated, too overwhelming. We do not talk about many pieces of the system - our approaches to assigning classes to people, our approaches to allocating TA positions, our approaches to scheduling, our approaches to grading. All sites of decisions and activity that can contribute to racism. As a result, we are not pursuing many avenues to change, and perhaps these elements are helping to keep the system stable and unchanged.

How might we distribute the work of allyship? This reframed question draws attention to think about sites of allyship and types of actions to do in those instances. If some aggressions are micro, might we see some ally actions as similarly micro, at least in timing. These ideas suggest an approach that would involve mapping sites of racist acts, like classroom discussions, hallway conversations, website images, so that people can practice noticing in such sites in order to commit to serving as an ally in those places. By helping individuals practice acts of allyship they are equipped to act when needed and it comes naturally.

We also need big, bold action. We need leaders and change agents to take the burden off of those who are minoritized. We also need to explore what could be done by those who are not the official leaders or the minoritized. By looking for a community of allies and upstanders where we are, students, faculty, staff and researchers can be enlisted in some form of allyship in order to move the community forward.

Proposing Systemic and Systematic Action

The themes of our above narratives -- the power of affirmation, casting a wide net, seeking equity, and enlisting everyone -- were motivations in our search to identify actions that could be taken to change our system. We take the stance that diversity, equity and inclusion is an important part of our work, individually and as a discipline. This moment, like others before, has required that we think critically and act intentionally as a disciplinary community in order to effect the change we need.

We offer the following actions that address some of the systemic equity issues of our field. The critical incident, the murder of George Floyd and the movement for Black lives led way for this conversation to occur. At the same time, our colleagues and students of marginalized identities, seen and unseen, have long needed these same changes from our discipline. The actions are organized to build on the themes in the narratives -- starting with foundational affirmation and equity, then moving outward enlisting everyone and casting a wide net. We offer additional suggestions to continue the conversation or to address explicitly many race-related topics that have not been discussed openly in our engineering education community. Several universities have offered statements as well as a collective group of Black engineering faculty

(<https://blackinengineering.org/action-item-list/>) who challenge universities to become anti-racist organizations with advocates for Black engineering faculty, staff, and students.

Changing hearts and minds is important, but changing the rules and value structures make the change lasting; changing the engineering education's cultural framework will bring along those whose hearts and minds have not made the shift as swiftly as the field needs.

Leadership in the field: DEI criteria for ASEE fellow nominations. Power is an essential feature for racism to take its position in our lives and discipline. While it can be argued that fellow status is granted as a result of power granted in the university and admiration across the field, the relationship is dialectical when we consider who becomes a fellow. Establishing measurable diversity criteria for fellows' nominations and awards, specific to underrepresented populations in engineering would add a level of responsibility for diversity outcomes with power. This could take form in demographics of successful graduate students, research collaborations, and funding impact that are inclusive of underrepresented engineering students, colleagues and voices. Also needed are champions who nominate and sponsor faculty of color who may not have access to the cultural capital required for ASEE Fellow nomination including how to solicit references or the presentation of competitive nomination packages. Similar expectations can be extrapolated to awards of all types within our discipline.

Research practices: Required certification for researchers to address race and ethnicity in their demographics and interpretation of findings. Much of the research in Engineering Education discusses race and gender as passive demographic and descriptive information for the research, however underlying assumptions about minoritized research participants that may be held by the researchers are typically unchallenged and undiscussed in the work itself. These epistemic issues are noticed by researchers who have exposure and experience in research methods, theories and approaches that are focused on racial, cultural and gendered identities. Worse yet, the reading and implementation of these works can trigger imposter syndrome for people marginalized in engineering. Standard IRB training does not necessarily provide the radical frame requested here. In order to negate harm, or add destructive literature to the canon, engineering education publication venues can require training for authors to publish data that is disaggregated or explained by race, gender, ethnicity, orientation or other vulnerable identity. That training should include critical and liberative methods, theories and research work by and about people whose experiences are frequently explained, yet further marginalized by misaligned research practices.

Interpersonal skill development: Department and faculty level resources for race-based equity and ally training. Race specific equity and ally training should become a regular activity of our professional organization. By educating members of the race-specific and shared oppressions of Black, Latinx, Native and other minoritized racial and ethnic populations in engineering, diversity, equity and inclusion becomes a normal expectation rather than the exception in moments of heightened awareness. These trainings must have high standards that rely on research-informed practices that address the needs of Black and minoritized students and faculty and take a human rights stance in developing a socially-just culture in engineering.

Organization level accountability: State-level representation for Black engineering enrollment. Member institutions and leaders report engineering enrollment data, disaggregated by standard demographic practices, through many venues, however there is little clear accountability for representation that extends beyond one's own campus. The number and the share of underrepresented engineering graduates has not changed for women, Black, Latinx and Native

engineers for years, despite the significant amount of research and funding to support minoritized student enrollment and graduation. Through its influence as an engineering professional organization, ASEE has the opportunity to hold institutions to account for improving representation and modernizing data methods to be inclusive of the diverse identities of marginalized engineers.

Accountability to individuals: Protection mechanisms for students, faculty and research participants. The ideal of “nothing about us without us” is credited to European labor movements, however the frame has been adopted by many social movements that focus on inclusion and representation. Naming correctly the identities of the community, engaging the people directly, not just to do research on them and their experiences, but for community review, analysis and dissemination of the work is critical. True inclusion requires ownership of narratives, data and storytelling and ensures that it is handled appropriately. Further, ASEE can consider providing mechanisms for Black and inequitably served engineers to anonymously report incidents of bias to the organization in a third-party fashion to protect the welfare of the engineering education community as a whole.

Conclusion

These are just some ways that our discipline and professional organization for engineering education can live up to its values of diversity and inclusion. Culture change includes all of the people and all of its artifacts; engineering, engineering education campus departments and specific programs must become sites of change. By aligning our espoused values with enacted values, Engineering Education can truly become the disciplinary community of choice for thoughtful, educational and inclusive practice in STEM.

Our engineering education disciplinary evolution has changed dramatically in the last 40 years, and if we wish to continue to lead we cannot shrink from the call to change our own culture and practices. Ensuring that Engineering Education is the true Beloved Community (The King Center 2020) that we portray and claim, we must act forward and decisively.

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