

Black in Engineering: How the Social Justice Efforts of Black Academics Affect Change

Dr. Carlotta A. Berry, Rose-Hulman Institute of Technology

Dr. Carlotta A. Berry is a professor in the department of Electrical and Computer Engineering at Rose-Hulman Institute of Technology. She is the director of the multidisciplinary minor in robotics and co-director of the Rose building undergraduate diversity scholarship and professional development program. She has been the President of the Technical Editor Board for the ASEE Computers in Education Journal twice, most recently in 2020. She is a member of ASEE, IEEE, NSBE, and Eta Kappa Nu.

Dr. Audrey Bowden, Vanderbilt University

Audrey K Bowden is the Dorothy J. Wingfield Phillips Chancellor Faculty Fellow and Associate Professor of Biomedical Engineering (BME) and of Electrical Engineering and Computer Science (EECS) at Vanderbilt University. Prior to this, she served as Assistant and later Associate Professor of Electrical Engineering and Bioengineering at Stanford University. Dr. Bowden received her BSE in Electrical Engineering from Princeton University, her PhD in BME from Duke University and completed her post-doctoral training in Chemistry and Chemical Biology at Harvard University. She is a Fellow of SPIE, a Fellow of AIMBE, a Fellow of OSA and a recipient of numerous awards. Her research interests include biomedical optics – particularly optical coherence tomography and near infrared spectroscopy, microfluidics, and point-of-care diagnostics.

Dr. Monica Farmer Cox, The Ohio State University

Monica F. Cox, Ph.D., is Professor in the Department of Engineering Education at The Ohio State University. Prior to this appointment, she was a Associate Professor in the School of Engineering Education at Purdue University, the Inaugural Director of the College of Engineering's Leadership Minor, and the Director of the International Institute of Engineering Education Assessment (i2e2a). In 2013, she became founder and owner of STEMinent LLC, a company focused on STEM education assessment and professional development for stakeholders in K-12 education, higher education, and Corporate America. Her research is focused upon the use of mixed methodologies to explore significant research questions in undergraduate, graduate, and professional engineering education, to integrate concepts from higher education and learning science into engineering education, and to develop and disseminate reliable and valid assessment tools for use across the engineering education continuum.

Prof. Tahira N. Reid, Purdue University at West Lafayette (COE)

Dr. Tahira Reid is an associate professor in the School of Mechanical Engineering at Purdue University and is a NASA Visiting Scholar for Fall 2020. Her research involves the quantification and integration of human-centered considerations in engineering systems and/or the design process. Her research program has received funding from the National Science Foundation, Procter & Gamble, Air Force Office of Scientific Research, and many others. Her projects that involved the intersection of diversity and mechanical engineering have been featured in media sources including National Geographic, NBC's Today Show, Essence Magazine, Reuters, National Public Radio and many others. A highly sought out role model for the younger generation, Dr. Reid Smith's story about her double dutch jump rope invention is featured in two children's books and was on the 2017 New York State English and Language Arts Common Core Exam administered to over 100,000 4th graders in the state of New York. Dr. Reid obtained BS and MS degrees in Mechanical Engineering from Rensselaer Polytechnic Institute and a Ph.D. in Design Science, from the University of Michigan - Ann Arbor.

Dr. Leroy L. Long III, Embry-Riddle Aeronautical University - Daytona Beach

Dr. Leroy Long III is an Assistant Professor of Engineering Fundamentals at Embry-Riddle Aeronautical University in Daytona Beach, FL. Dr. Long directs a research team called Engineering, Arts and Sports Engagement (EASE). His research interests include: (a) educational equity and racial justice, (b) student

retention and career readiness, as well as (c) students' ethical reasoning and technology use, with a particular focus on STEM students. Most of Dr. Long's research has focused on the academic and social experiences of Black and Latinx groups as well as student-athletes in STEM fields. He helped to lead research, funded by the NCAA Innovations in Research and Practice Grant, to improve the well-being of the student-athlete through support of their career readiness. He also helped to secure funding from NSF (award # 2024973) to examine the potential benefit of using critical narratives as a pedagogical tool in the professional formation of engineers. To contact Dr. Long, email: Leroy.Long@erau.edu.

Black In Engineering: How the Social Justice Efforts of Black Academics Affect Change

Abstract

In Spring 2020, many faculty found themselves working from home as the world experienced a once in a lifetime pandemic. May 25, 2020, brought angst to the U.S. as the world witnessed the killing of George Floyd. In June, the BlackInTheIvory hashtag started trending on Twitter, bringing attention to inequities and injustices Black people face in academia. These events were a wake up call and confirmation that it was time for Black faculty across disciplines to unite against social injustice and racial inequity, which negatively impacts them inside and outside of the academy.

In June 2020, over 60 Black engineering faculty met and decided to convene in solidarity with the goal of dismantling racially oppressive higher education systems. They realized that many Black engineering faculty have continually experienced systemic racism, from their days as undergraduate or graduate students to their current roles as professors. They decided to work collectively to bring awareness to their concerns and to make engineering professional environments places where Black engineering faculty are respected and treated equitably. They wanted to thrive rather than just survive in engineering. They demanded that everyone respect their humanity. Out of the meeting, the Black In Engineering (BIE) social justice movement was created to promote swift and lasting change in academia.

Drawing on the 400+ members of the [Academic and Research Leadership \(ARL\) Network](#), BIE became the social justice arm of ARL, capitalizing on the strength of the Black engineering professional community to consolidate social justice efforts and provide spaces to share experiences and resources. The goal was to celebrate who we are as engineering professionals, educate those who wish to join our; Movement, and connect with sponsors and allies. BIE includes a media campaign, call to action, messaging, policy, finance, strategic planning, networking and empowerment, and community engagement components.

To date, BIE has amplified the experiences of Black engineering faculty, connected to current and potential partners, and presented about our call to action. The call to action includes specific recommendations for improving the racially hostile climate in engineering with a focus on anti-Black racism. We aim to help individuals overcome implicit bias and marginalization while standing in solidarity with overall activism efforts for Blacks in America. Dissemination of BIE efforts has occurred via a [website](#), a [YouTube channel](#) (with over 255 subscribers with 9500 views), and Twitter account (with nearly 6,000 followers). BIE members have also written several articles and blog posts, been guests on several podcasts, conducted workshops, and held a joint recruiting and awareness campaign week with the [Black In Computing](#) organization. The Black In Computing website has an open letter and call to action to the computing community from Black In Computing and their allies. Black In Engineering used their call as inspiration for their work.

The goal of this paper is to provide details on and raise awareness of the BIE “Call To Action, On Becoming an Anti-Racist Institution,” which has garnered more than 200 signatures from allies, advocates, and members. The Call to Action centers on five principles: attitude,

clarity, institutional accountability, personal accountability, and commitment and resources). It also targets five areas and groups (i.e., system-wide, faculty, staff, undergraduate students, and graduate students). It provides insight on how institutions can implement the recommendations by intersecting with other DEI efforts such as the American Society of Engineering Education (ASEE) Dean's Diversity Initiative and Diversity Recognition Program (ADRP), the American Association for the Advancement of Science (AAAS) SEA Change, and the ASPIRE Alliance. Finally, it is to offer advocates and allies suggestions on making these strategies actionable and sustainable across stakeholder groups and to suggest ways to integrate BIE strategies with universities' other diversity, equity, and inclusion goals.

Introduction/Motivation

Within the engineering academic community, several initiatives were founded to convene Black faculty and to create spaces for them to thrive. Primary features of these groups included workshops in which faculty could engage in professional development and scholarly communities. Many of these initiatives were created for junior faculty, in particular women of color.

Among these initiatives include the PURPOSE Institute and the National Institute for Faculty Equity (NIFE), founded by Drs. Christine Grant and Gilda Barabino, two accomplished senior Black women engineering leaders with passions for mentoring minoritized and marginalized junior faculty. The PURPOSE Institute began with a peer mentoring initiative for chemical engineering faculty in 2005 and resulted in a series of Summits in North Carolina and California for Women of Color (WoC) STEM faculty. Since 2004, NIFE has offered workshops and academic resources for women and minorities in STEM [1], [2]. Many of these initiatives were funded by NSF Advance grants.

In 2012, the Academic Research Leadership Network (ARLN) was founded by Drs. Samuel Graham, Baratunde Cola, and Raheem Behah to create an online community of Black engineering faculty and meet in an annual symposium co-located and co-facilitated with the annual National Society of Black Engineers (NSBE) conference. The Academic Research Leadership Symposium (ARLS) serves as a yearly meeting of largely Black faculty to enhance the professional development of postdocs and early to mid-career faculty. The 2019 ARLS featured a panel of journal editors, sessions on starting up and managing a research lab, lightning talks featuring work of early-career faculty, and many other activities [3]. In addition, this gathering creates opportunities for participants to share stories and identify ways to work together strategically in their academic careers [3].

With the onset of the pandemic and the murders of George Floyd and Breonna Taylor in 2020, Black engineering faculty rallied to identify new ways to advance their scholarly pursuits while displaying solidarity with Black men and women in the U.S. experiencing police brutality. In a series of Call to Action meetings, the Black in Engineering (BIE) social justice movement was born, followed by the creation of the Academic Leadership Network Inc., a nonprofit organization merging ARLN with BIE (see Figure 1).

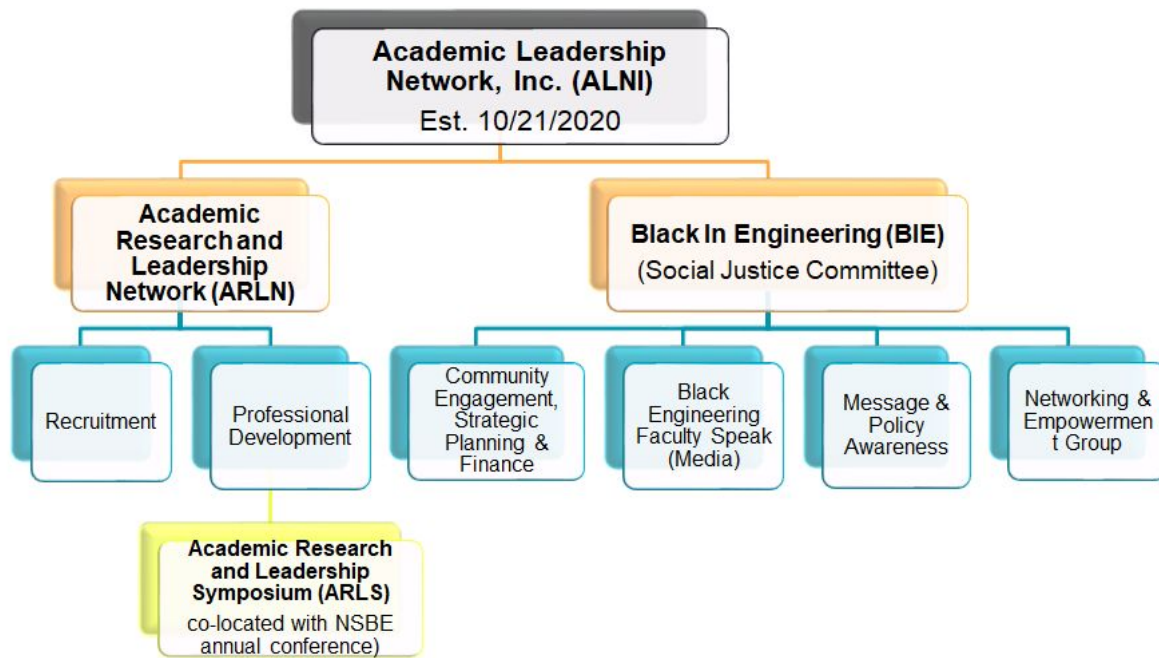


Figure 1. Academic Leadership Network Inc. Organizational Structure

Literature Review

When it comes to the current efforts on social justice and racial inequity, BIE is “standing on the shoulders of giants.” Critical race theorists have paved the way through decades of foundational work on the topic [4]-[8]. Ibram Kendi’s increasingly popular anti-racism work has helped to advance these initiatives as well [9]. Kendi [9] states, “all policies, ideas and people are either being racist or antiracist... A racist or antiracist is not who we are, but what we are doing in the moment.” Therefore, in this paper, we will not provide detailed accounts of the racist history and foundation of US engineering programs but rather focus our attention on what has been done, is being done, and should be done to undo racist anti-Black policies and practices within US engineering programs. For example, the graphic in Figure 2 provides concrete steps on how to become an anti-racist individual.

Within higher education, DEI-focused strategic plans have been developed at institutions such as the University of California, Berkeley in 2009, MIT in 2010, the University of Michigan in 2016, the University of Toledo in 2016, the University of Wyoming in 2017, and the University of Colorado, Boulder in 2019, to name a few [11]-[17]. Existing strategic plans involving DEI provided us with example templates for the recommendations we later compiled and shared. For example, MIT’s [12] “Report of the Initiative for Faculty Race and Diversity” found that Black faculty were less likely to obtain tenure than their White and Asian counterparts. Black faculty believed they had to meet a “Nobel standard” to be hired or earn tenure while their White counterparts could just be “good-enough” [12]. MIT’s [12] report provided the team with example recommendations from successful internal diversity programs as well as additional ideas from their overall internal investigation. Within engineering education, the American Society of Engineering Education (ASEE), has a Committee for Diversity, Equity, and Inclusion (CDEI). The CDEI offers numerous resources in the form of workshops, diversity

papers, inclusive communities, and a blog. The CDEI has facilitated and recorded over a dozen workshops, including one led at the end of 2020 called “Black In Engineering Social Justice Movement: Black Engineering Faculty Speak” [18]. We appreciate the opportunity to partner with existing DEI organizations and share our efforts with others in the community.



Figure 2. How to become an Anti-Racist Individual [10]

Messaging

In order to promote awareness of the Black In Engineering social justice movement, the group launched a media campaign. It was decided that in order to be the most impactful, there needed to be a multi-pronged approach which involved social media, videos, articles, podcasts, webinars, and a website. These non-traditional methods of amplifying our voice were proven to yield significant results and this section provides a summary of some of those initiatives and their impact.

Videos

The initial video, “Black Engineering Faculty Speak - We Rise” was released on YouTube on July 5, 2020, and was shared widely to positive results [19]. The goal was to bring awareness to the experiences of Black people in STEM including marginalization, hypervisibility, presumed incompetence and implicit bias. The video has received 6,800 views, 267 likes and 46 comments. Due to the widespread impact of this one video, the team received numerous requests for interviews, speaking engagements, and articles. Since July 2020, there have been 35 videos released and 5 playlists created on faculty experiences, research, addressing representation, falling in love with STEM, and black history month. As evidence of the success of these efforts, the associated YouTube channel has 252 subscribers, approximately 280 hours of watch time and 9,400 views.

Twitter and Instagram

The primary source for community engagement is the [@BlkInEngineering](#) Twitter account, which currently has 5,784 followers. For Black History month, BIE also launched an [Instagram](#) account which currently has 182 followers. There have also been numerous networking events to build community among Black engineering professionals working in academia, industry as well as graduate students, including a happy hour and coffee break with a total of 133 registrations. There was also a joint Black In Engineering and Black In Computing week held in August 2020, which resulted in global engagement and connection of Black engineers, allies, and advocates. Figure 3 shows screenshots from Twitter and Instagram during the engagement and awareness week.

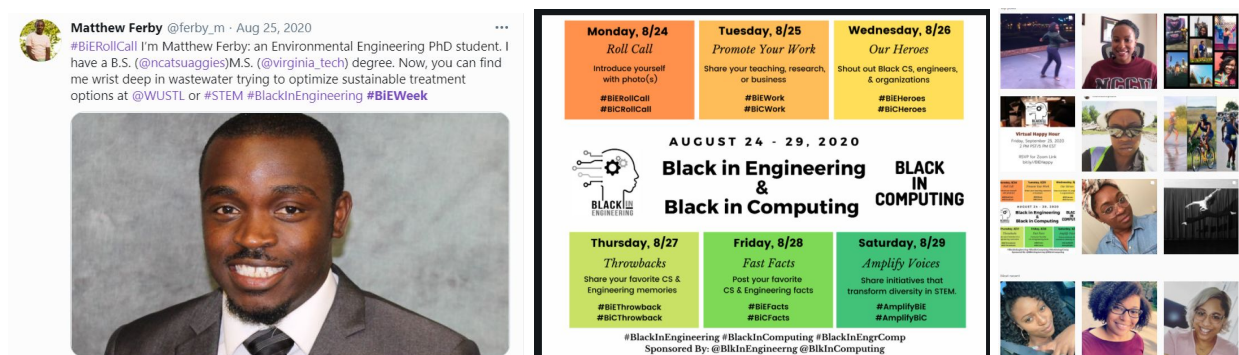


Figure 3. Black In Engineering Week 8/24-8/20/2020 on Twitter and Instagram

Webinars, Workshops, Podcasts, Interview, Articles

Some of the most significant activities were a workshop for the NSBE Dean and MEP roundtable to discuss ways to make the call to action actionable and sustainable with key constituents. Also, the webinar for the ASEE CDEI to discuss the call to action and ways to address the recommendations for graduate students, undergraduate students, faculty, and staff. The call to action was also shared with the ASEE Engineering Dean's Council. Table 1 provides a summary of other activities undertaken in the messaging, policy, and awareness campaign.

Table 1. Black In Engineering Messaging, Policy, and Awareness

Date	Event	Venue	Impact
7/9/20	Black Engineering Faculty Speak: Silence is No Longer an Option	Medium	Data not available
7/31/20	How to Grow Black Engineers	Facebook	110 reactions, 131 comments, 7k views
8/11/20	Black Engineering Faculty Speak	South Phoenix Oral History	Data not available

		Project	
8/21/20	Black in Engineering Call to Action	NSBE Dean's and MEP Directors Roundtable	300 registrations
9/4/20	Social Justice in Engineering	neXt Live, LinkedIn	61 reactions, 47 comments, 1,297 views
10/28/20	Black In Engineering: Intersections of Race, Gender and Social Justice	New Mexico State University	Data not available
11/1/20	We exist. We are your peers.	Nature Magazine	Data not available
11/4/20	Black in Engineering	Engineering Change Podcast Spotify	Data not available
12/18/20	Black In Engineering	ASEE CDEI	150 registrations
7/26-29/21	Black in Engineering Social Justice Movement	ASEE 2021 Distinguished Lecture	Data not available

Call To Action

In the wake of significant interest around improving the climate for Black Engineers at academic institutions, the members of Black in Engineering quickly recognized the potential role they could play in advising institutions on recommended courses of action. The group felt that it was important to respond; in fact, several of the members had been directly asked by their institutional leaders to provide input on this topic. Given the small numbers of Black faculty at any one institution, the members of BIE recognized that 1) collective brainstorming was likely to produce more ideas than would be generated by any one person; 2) recommendations would have more staying power if provided from the perspective of many, rather than an isolated few; 3) many individuals had neither the time nor resources to identify recommendations that would cover the vast range of necessary changes. Hence, the idea for the Call to Action was born.

The goal of the Call to Action is to serve as a starting point for ideas of specific, implementable actions that BIE feels would help move the needle on changes that are necessary to eradicate anti-Black racism at academic institutions. The document represents a collective response from the members of BIE, who comprise faculty members with appointments in Engineering and Engineering Education, across all levels of status (Assistant to Full Professor, including tenure track and research track) at research and teaching institutions of all kinds across the entire United States. Public access to the document is available through the BIE website [20].

Process

The general process for drafting the document was as follows: two members of BIE were assigned to spearhead the effort by formulating an initial draft. This draft was then circulated to the whole membership for comment and revision. A collective, open period of revision was instituted for a period of nearly two weeks, during which several members of BIE added substantive new ideas. After a final editorial period of nearly 14 days, the document was finalized in shareable form via the aforementioned public link. Individual members were free to share the document with institutional leadership, and the BIE leadership also coordinated efforts to share the document widely with the academic community through forums such as the NSBE Dean's RoundTable, the ASEE CDEI virtual presentations and workshops, and other media appearances that referenced the document.

Document Structure

The Call to Action begins with a brief introduction that contextualizes the issue of anti-Black racism along with a vision of an anti-racist institution might look like. Inspired by the poetic rhetoric of Ibram Kendi [9], the Call to Action poses a provocative list of seven rhetorical questions such as what if “the efforts of black staff, faculty, and students in building and improving the institution are acknowledged, applauded, and rewarded?” or what if “Black members of the university are welcomed as full participants, rather than treated as tokens of diversity?” These questions give insight into several of the concerns that we feel underlie the current practices that sustain systemic anti-Black racism at academic institutions, and they are a source of inspiration for the recommendations that follow.

Elaboration of the Principles

Early in the process, it was recognized that the Call to Action could easily become a document that, like many white papers and committee reports produced at academic institutions, sits on the shelf. In an effort to avoid such a fate, the document framers recognized that the necessity for readers to approach the document with positive intent. Those who approach the document with an eye to find implementable ideas will likely find some; conversely, those who approach the document with the expectation that nothing can be done at their institution will likely draw such a conclusion. In an effort to stimulate the reader to adopt the first perspective, the document leads with a set of overarching principles that should govern the way one approaches the document prior to reading it. As described in the Call to Action: “we first offer a set of principles of acknowledgement that are necessary to adopt the strength of character that is necessary to undergo the hard work of making an anti-racist university.” In summary, the principles pertain to attitude, clarity, institutional accountability, personal accountability, and commitment and resources.

- Attitude - The principle of attitude deals directly with that of intent. The suggestion is made that one approaches the Call to Action with an assumption that their institution already suffers from deep, systemic racism. The general idea is that someone who assumes there is a problem is more likely to genuinely seek out opportunities to fix it. In contrast, someone who assumes there is no problem is likely to view any proposed solutions as unnecessary and irrelevant.

- Clarity - The principle of clarity could alternatively be considered one of focus. Many institutions have bought into the idea of trying to improve diversity and inclusion. While such ideas and committees are intended to address all manner of potential -isms, the BIE feels it is important to bring focus to the issue of anti-Black racism in particular so that specific solutions can be implemented to address racism against the Black community. The document itself also raises issues that have been particular points of contention for the Black academic community; such issues may be overlooked if readers only look to address issues that will combat -isms that affect a broad population.
- Institutional Accountability - The principle of institutional accountability proffers that it is insufficient to develop goals for change without commensurate plans to keep striving to achieve goals in the face of failure. Goals for change and racial equity should be viewed similarly to a household budget deficit: just as the unsustainability of running a continual deficit necessitates action to address the problem, so should failure to achieve racial equity and overturn anti-Black racism simulate an urgent, incessant quest to address all issues until there is no issue.
- Personal Accountability - The principle of personal accountability dismantles the notion that “the institution” is something or someone other than the members of its community. That is, the institution cannot become anti-Black racist unless and until all the members of its community have also become so. Change must be evidenced in the hearts, attitudes and actions of the people in the community; we recommend that such change first begin with the leadership.
- Commitment and Resources - The principle of commitment and resources opposes the idea that committee reports are an end in themselves. Real action to move the needle on anti-Black racism will require resources (personnel, finances, policies). Making an effort to commit to providing such resources - in advance of and independent of any committee findings - speaks to the idea of positive intent and significantly increases the likelihood of change. Such advance commitment can also empower and encourage any committees charged to do this work with the knowledge that their efforts and time will not be wasted or overlooked. Given the long timeline and slow rate of change at many universities in the wake of committee investigations, we also recommend that the committee and task-force process be skipped altogether, when possible, as a stronger show of commitment and resources.

Overview of the Recommendations

We propose five sets of recommendations, divided by scope of the target audience: 1) system-wide initiatives affect the entire university community; whereas, recommendations for 2) faculty, 3) staff, 4) graduate education, and 5) undergraduate education provide ideas for targeted opportunities to improve the experiences of constituents in these communities. While several of the recommendations overlap with those already proposed in the Diversity and Inclusion plans of some universities, many are born directly out of the collective experience of BIE members, who have yet to see some of these changes made at their respective institutions.

The system-wide recommendations touch on the following topics: historical education, implicit bias and diversity training, high-level commitment, accountability, fundraising,

leadership and administration, policing, spending, disaggregation and tokenism. We recognize that some recommendations may be difficult to administer, which highlights the importance of the principles delineated at first. For example, the recommendation on historical education encourages institutions to acknowledge and provide training to the university community on the racist history of the US and the institution. Such information may not already be well known, may be difficult to identify or may unearth negative roots of a past injustices that one wishes were never perpetuated. Furthermore, if one has not already adopted the attitude that the system is inherently racist, it could be easy to dismiss the need for historical education altogether. The reality, however, is that many Black members of the community do suffer the effects of systemic racism at their institutions, and refusal to acknowledge this denies them the opportunity to be relieved of the ongoing oppression they experience as a result of such a system.

The recommendations for faculty cover the following topics: recruitment and retention; promotion, tenure and annual review; teaching; community-building; compensation; collaborative research funding; endowed fellowships and grant funding. While the underlying issues are of interest and important to all faculty, the challenges for Black faculty are particularly acute and require focused attention through the actions proposed in the recommendations. For example, the dearth of Black faculty at a given institution can naturally lead to feelings of isolation, which can be exacerbated by lack of access to informal mentorship opportunities. Faced with this challenge, many Black faculty seek community with other Black faculty - an endeavor that requires expenditure of additional time and financial resources compared to non-Black peers. Yet these community-building experiences are critical and ultimately benefit the individual and the university in many ways, including by providing opportunities for professional training and network-building that is needed to propel faculty to success in their research. To this end, universities should view direct support of such activities - for example, by providing dedicated funds for participation - as investments that serve to yield a positive return.

The recommendations for staff are by no means exhaustive, but cover important topics: diversity, training and professional development and raises and promotion. Although staff are often overlooked, we recognize that the visibility of staff - especially to students and other faculty - can play a key role in shaping the perceptions of the entire community. The recommendations in the Call to Action are intended not just to bolster support for Black staff, but to also ensure that all staff interact with the community in ways that promote an inclusive, anti-racist environment.

The recommendations for graduate student initiatives include ideas on recruitment, retention, fellowships and financial support, advising, mental health, professional networking, teaching, vulnerability, technical talks, historically Black colleges and universities, international students and Black organizations. While many of these recommendations would do well to improve the climate for all graduate students, focused attention is needed to ensure adequate support for Black graduate students. Consider, for example, that students' experiences at an institution are not limited to their interactions with the university, but may be affected in large part by their interactions with the local community. Black students may have more difficulty finding attractive housing options if they encounter prejudice in the housing market, or may find it desirable to live in neighborhoods with higher demographic representation of Blacks -- even if it requires more travel -- to compensate for the lack of community they may feel on campus.

Initiatives to support graduate students should consider the whole student experience, both in and out of the classroom and, as students develop into independent individuals, behind the podium.

The recommendations for undergraduate initiatives consider the typical student lifecycle: recruitment and admissions, widening the pathway, preparation for engineering, and retention. Unlike graduate students, who are often admitted at the behest of particular faculty with whom they will work directly, universities typically admit undergraduates as a broad cohort into programs that are largely pre-defined. This fact necessitates thoughtful intentionality to diversify the pipeline and ensure that students are prepared to succeed so that gains on admission are not lost to attrition. One should understand, though, that the challenges of retention are not limited to students' individual fortitude and preparation - for many Black students, the hurdles to success include prejudice from instructors and peers that can lead to isolation, lack of access to resources (e.g., test banks) and exclusion from study groups that are often key to meaningful social interaction that simultaneously connect one better to the discipline and bolster one's knowledge and preparation for exams.

Strategic Plan for Call To Action

The purpose of our strategic plan for implementation of the Call to Action recommendations involves intersecting with campus DEI efforts and larger DEI efforts. As part of the plan we have engaged with constituents and discussed ways to implement the following levels for the Call to Action by addressing the following questions and then reflecting on the levels in Figure 4.

- How do we make the initiatives actionable?
- How do we make the actions sustainable?
- How do we measure success of the actions?
- How do we manage accountability for the initiatives?
- What did we miss? What have we not considered?
- What are the strengths, weaknesses, threats and opportunities?



Figure 4. Call To Action Levels of Action

Next Steps

The BIE Call to Action offered a solid foundation for the launching of other BIE strategic initiatives. Among these include collective accountability for DEI initiatives for Black engineering students, faculty, and staff, peer mentoring that connects members of our growing network, and partnerships with initiatives and organizations (e.g., ASEE Dean’s Diversity Initiative, ASEE Engineering Dean’s Council, Diversity Recognition Program, SEA Change and ASPIRE Alliance) to extend our BIE work and identify intersections between BIE and potential partners [21]-[27].

In addition, we are broadening our reach beyond academia and beyond engineering and are looking for advocates across STEAMX where this stands for science, technology, engineering, arts, mathematics, extracurricular or sports. This includes engaging with celebrities like MC Hammer on social media and coordinating efforts with other “Black in” organizations collectively known as “Black in X [28].”

Like our predecessor organizations, BIE was founded by tenured faculty who are committed to ensuring that junior faculty benefit from our efforts and are protected from potential backlash of our social justice emphasis. Although much work is required to run the BIE, we do not want junior faculty and graduate students to do the heavy lifting. We continue to define what this looks like for our members.

BIE’s success is dependent partially on partnerships with allies and advocates who can facilitate lasting change for BIE initiatives. Some of the ways to engage with the constituents to determine how the call to action aligns with other relative initiatives, BIE has identified several strategies to align with other efforts, particularly the alignment of our call to action with the

ASEE Dean's Diversity Initiative letter; DEI statements from the engineering colleges considered exemplar based upon the ASEE Diversity Recognition program Bronze awardees; the criteria for AAAS Sea Change awards; and ASPIRE Alliance initiatives for inclusive and diverse STEM faculty [29].

Conclusions

In less than seven months, BIE has implemented a grassroots movement led and facilitated by Black engineering professionals working in academia. Rather than working individually and waiting for universities to take action on their organization's diversity statements, BIE members found a way to apply nontraditional methods to transform the academic landscape in a new way. Although the foundation was laid for us and by us, we recognize that we need allies and advocates to implement and sustain this work since systemic racism remains a key fixture in most organizations in which BIE members work. Although there is strength in numbers, it is still necessary for BIE to have access to resources and power structures. This is necessary in order to work within the institutions to implement anti-racist policies.

What makes the BIE efforts different from what has been done before is that Black engineering academic professionals are co-creating strategies that offer us the support we need to be successful on our respective campuses. We will offer BIE-sponsored webinars and workshops that engage stakeholders in authentic conversations with actionable strategies for success along with suggestions for allies and advocates on making BIE strategies actionable and sustainable across stakeholder groups and to integrate BIE strategies with universities' other diversity, equity, and inclusion goals. Such partnerships may provide insights that can be replicated in engineering colleges, schools, and departments around the country. We will also seek funding from NSF for strategic planning to support these efforts and make them actionable and sustainable.

References

- [1] C. Grant, J. Decuir-Gunby, and B. Smith. (June 2010). ADVANCE peer mentoring summits for underrepresented minority women engineering faculty. Presented at ASEE 2010 Annual Conf. and Expo., Louisville, KY, USA. [Online]. Available: <https://peer.asee.org/advance-peer-mentoring-summits-for-underrepresented-minority-women-engineering-faculty>. [Accessed: 07-Mar-2021].
- [2] "National Institute for Faculty Equity." Serc.carleton.edu. . [Online]. Available,: <https://serc.carleton.edu/facultyequity/index.html>. [Accessed: 07-Mar-2021].
- [3] "2019 Symposium." Arlnetwork.org. [Online]. Available: <https://arlnetwork.org/symposium/2019/>. [Accessed: 07-Mar-2021].
- [4] D. Bell, "Who's afraid of critical race theory?," *Univ. of Illinois Law Review*, pp. 893–910, 1995.
- [5] K., Crenshaw, N. Gotanda, G. Peller, and K. Thomas, Ed., *Critical Race Theory: The Key Writings that Formed the Movement*. New York, NY: Free Press, 1995.

- [6] R. Delgado, and J. Stefancic, *Critical Race Theory: An Introduction*, vol. 20, New York, NY: NYU Press, 2017.
- [7] G. Ladson-Billings, and W. Tate, "Toward a critical race theory of education," *Teachers College Record*, 97, pp. 47–68, 1995.
- [8] P. J. Williams, *Seeing a Color-Blind Future: The paradox of Race*, New York, NY: Farrar, Straus & Giroux, 1998.
- [9] I. X. Kendi, "This is what an antiracist American would look like. How do we get there?" *The Guardian*, December 6, 2018. [Online]. Available: <https://www.theguardian.com/commentisfree/2018/dec/06/antiracism-and-america-white-nationalism>. [Accessed March 7, 2021].
- [10] *surveydesign.com*. [Online]. Available: <http://www.surveydesign.com/>. [Accessed: 18-Dec-2020].
- [11] University of California, Berkeley Strategic Plan for Equity, Inclusion, and Diversity, Pathway to Excellence, 2009. [Online]. Available: https://diversity.berkeley.edu/sites/default/files/executivesummary_webversion.pdf. [Accessed: 07-Mar-2021].
- [12] MIT. The Report on the Initiative for Faculty Race and Diversity. 2010. [Online]. Available: <http://web.mit.edu/provost/raceinitiative/report.pdf>. [Accessed: 07-Mar-2021].
- [13] The University of Michigan, Diversity, Equity & Inclusion Strategic Plan (2016-2021) [Updated October 2019], <https://diversity.umich.edu/strategic-plan/>. [Accessed: 07-Mar-2021].
- [14] The University of Toledo Strategic Plan for Equity, Inclusion and Diversity, 2016. [Online]. Available: <https://www.utoledo.edu/diversity/diversity-plan/docs/diversity-plan.pdf>. [Accessed: 07-Mar-2021].
- [15] University of Wyoming ODEI Strategic Plan for Diversity, Equity, and Inclusion, 2017 – 2022, [Online]. Available: http://www.uwyo.edu/strategic-plan/_files/docs/odei-strategicplan2018-r3-.pdf. [Accessed: 07-Mar-2021].
- [16] University of Colorado Boulder, Inclusion, Diversity and Excellence in Academics (IDEA) Plan, 2019, [Online]. Available: <https://www.colorado.edu/odece/diversity-plan/inclusion-diversity-excellence-academics-idea-plan>. [Accessed: 07-Mar-2021].
- [17] Black Graduate Students Association at MIT, Recommendations for Addressing Racial Bias at MIT, 2015, <http://bgsa.mit.edu/sbl2020>. [Accessed: 07-Mar-2021].
- [18] "ASEE Diversity," *ASEE Commission on Diversity, Equity, and Inclusion*. [Online]. Available:

<https://diversity.asee.org/deicommitee/2020/10/03/black-engineering-faculty-speak/>. [Accessed: 07-Mar-2021].

- [19] *Black Engineering Faculty Speak*, 05-Jul-2020. [Online]. Available: <https://www.youtube.com/blackengineeringfacultyspeak>. [Accessed: 07-Mar-2021].
- [20] *Black in Engineering*, 19-Jul-2020. [Online]. Available: <https://blackinengineering.org/>. [Accessed: 07-Mar-2021].
- [21] *Engineering Deans Council American Society for Engineering Education*. [Online]. Available: <https://www.asee.org/member-resources/councils-and-chapters/engineering-deans-council>. [Accessed: 07-Mar-2021].
- [22] *Engineering Deans Council American Society for Engineering Education Diversity Initiative Signed Letter*, 03-Jan-2017. [Online]. Available: <https://www.asee.org/member-resources/councils-and-chapters/engineering-deans-council>. [Accessed: 07-Mar-2021].
- [23] “ASEE Diversity Recognition Program (ADRP),” *ASEE Diversity Recognition Program ADRP*. [Online]. Available: <https://diversityrecognition.asee.org/?s=ASEE%2BDiversity%2BRecognition%2BProgram>. [Accessed: 07-Mar-2021].
- [24] B.H. Jackson and R. Hardiman, R., 1999. *Continuum on becoming an anti-racist, multicultural institution*. [Online]. Available: <https://racc.org/wp-content/uploads/buildingblocks/foundation/Continuum%20on%20Becoming%20an%20Anti-Racist,%20Multicultural%20Institution.pdf> [Accessed: 07-Mar-2021].
- [25] “Aspire, The National Alliance for Inclusive and Diverse STEM Faculty,” *Aspire*. [Online]. Available: <https://www.aspirealliance.org/>. [Accessed: 07-Mar-2021].
- [26] *SEA Change*. [Online]. Available: <https://seachange.aaas.org/>. [Accessed: 07-Mar-2021].
- [27] “ARISE Innovation Guidelines and Maturity Model,” *Advancing Research & Innovation in the STEM Education of Preservice Teachers in High-Need School Districts (ARISE)*. [Online]. Available: <https://aaas-arise.org/resources/advancing-research-and-innovations-in-preservice-education-programs/>. [Accessed: 07-Mar-2021].
- [28] *Black in X*. [Online]. Available: <https://www.blackinx.org/>. [Accessed: 07-Mar-2021].
- [29] “ASEE Diversity Recognition Program Bronze Awardees,” *ASEE Diversity Recognition Program ADRP*. [Online]. Available: <https://diversityrecognition.asee.org/recognized-institutions/>. [Accessed: 07-Mar-2021].

Acknowledgments

We would like to acknowledge all the members of Black In Engineering, Academic Research and Leadership Network, the engineering community, our allies and advocates who supported us in this work.