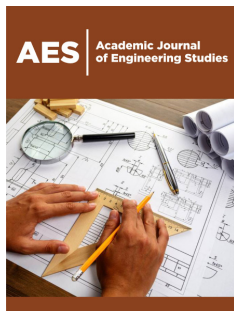


Teaching the Disinherited: Embedding Pro-Blackness in Engineering Pedagogy

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Opinion

“It appears that my worst fears have been realized: we have made progress in everything yet nothing has changed” [1]. As the field of Engineering Education (ENE) continues to establish its own disciplinary identity, Black people continue our campaign for full recognition of our dignity in both engineering education and practice. Scholars engaged in engineering education research have long debated whether the focus within ENE should be on modifying teaching practices or studying how students learn [2]. Simultaneously, the importance of racially/ethnically diversifying engineering remains a prominent talking point even as efforts to do so have minimal success [3,4]. My position is ENE has lacked functional discussion of repairing the harm that has already been caused as new innovations and developments are burgeoning. Despite a wealth of literature related to the experiences of Black people in the field, much of the work is disconnected and reveals the failure of ENE to appreciate our humanity and scholastic contributions [4]. Perhaps even more daunting is the implied responsibility for this reality is laid upon Black people as deficit narratives pervade the literature (Harper 2010, Mahoney 2017, Mejia et al. 2018). I problematize such dispositions and propose healing-centered academic engagement in engineering teaching, research, and practice. Said differently, I propose engineering educators take responsibility to address the problem of exclusion by fixing our pedagogy, rather than aiming to “fix” the people who have been excluded. This work magnifies the call put forth by Museus et al. (2015) to re-think, re-analyze, and re-define higher education by endorsing repair, redemption, and recompense for the dehumanization and exploitation of Black Americans in engineering. The unaddressed malpractice in engineering teaching necessitates a conciliatory approach to ENE research for a truly holistic paradigm to inform attempts of amplifying and enriching participation of Black people in engineering. As our nation continues to demonstrate advanced technological ability via exploits in international military affairs, space exploration, and electrical vehicle development, many Black communities remain neglected. Our government felt comfortable establishing Black ghettos [5] but lacks vigor in setting right such treachery consequently, STEM educators can promote self-determination in their instruction by using authentic contexts as starting point for problem-solving. Engineering faculty that are aware of issues regarding social inequity and are willing to challenge them with their instructional practices can build an awareness in their students to training them to respond productively. Riley [6] delineates liberatory praxis in teaching, research, and the broader educational experience within a thermodynamics course. Riley makes clear the distinction between liberation and ideals like diversity, equity, and inclusion; adopting liberation as a goal means making a commitment to work to end oppression based on race, class, and gender, and to seek justice, not only in our classrooms, but also across the profession and in society”. Situating such considerations within a core engineering course like thermodynamics is uncommon and underexplored. Whereas, describing the issue of low presence of Black people in engineering operates as a protective measure for the people and policies that exclude us. Moreover, the harm we have experienced go unaddressed in favor of new forward-thinking reforms. With this article I am calling for shifting our educational practices to be pro-Black affirming Black representation and expression, Black normality and ingenuity, moving from shallow tolerance to prioritizing the needs, perspectives, and contributions of Black people in engineering.

Pro-Black engineering education takes seriously the ways disciplinary knowledge and forms of racialized power have been co-constructed to minoritize and exclude Black people, seeking instead to formulate new conceptions of engineering that are culturally affirming. Pro-Black engineering education considers to what extent can interweaving sociopolitical consciousness within subject matter boost the engagement and comprehension of Black students that desire to solve problems that are meaningful to their cultural community. Pro-Black engineering education also engages the resource gaps Black students may have due to systematic disenfranchisement by focusing on bringing students in rather than weeding them out. Faculty are viewed as figures of epistemic authority it is urgent that engineering faculty model pedagogical integrity through teaching that affirms Black students' rightful presence as intellectual contributors. Of course, this requires more than simply acknowledge the cultural differences present in their classroom, faculty must consider the inclusion of the cultural viewpoint of their students in curriculum materials (i.e., textbooks, videos, field trips), societal prejudices experienced by their students outside of the classroom, and even examine their own prejudices. This is not about establishing a set of curricular instructions or best practices, rather a philosophical perspective that undergirds the teaching strategies implemented by an instructor. I encourage engineering faculty to develop political clarity within themselves, political clarity refers to the process by which individuals achieve a deepening awareness of the sociopolitical and economic realities that shape their lives and their capacity to recreate them. In addition, it refers to the process by which individuals come to better understand possible linkages between macro-level political, economic, and social variables and subordinated groups' academic performance at the micro-level classroom. The call by Lee & Rodriguez [7] for more critical examination and alternate suggestions for solutions to racial equity in engineering higher education is preceded by adopting a solution posed to the broader racist society in which engineering exists. Black Americans have a lineage of excellence in engineering that pre-dates our American chattel slavery [8,9], so more self-reflection is necessary to uncover why this legacy of ingenuity is suppressed within engineering education in the United States. Though systemic oppression is not included in the Grand Challenges for Engineering, as a member of the engineering community, I consider the agony

many Black Americans experience in their everyday lives either in pursuit of inclusion within the engineering community or in consequence of flawed engineering solutions, a grand dilemma for the profession. Perhaps, part of the failure to achieve broader success in engineering for Black people is related to the impetus for increasing racial/ethnic diversity. Racial/ethnic diversity is seen as a byproduct of changing demographics in a competition for international innovation and workforce fulfillment, rather than a judicious consequence of equal opportunity in a democratic republic. Major reports that characterize racial/ethnic diversity as an asset to engineering fail to specify in what ways the identity and/or culture of these students will be beneficial to the field besides altering statistics marking their presence. Engineering at its core is about problem-solving, and one of the biggest problems we have in engineering education is validating that Black minds matter.

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