

Disentangling engineering education research's anti-Blackness

We in the United States live out our lives in a white-supremacist social order in which the economic, political, and cultural interests of a European American elite dominate social institutions.

– Madhubuti, 1994, p. 10.

1 | INTRODUCTION

As the nation navigates a novel coronavirus pandemic, racism in America has become prominent in public discourse in a way not typical in recent history. The systemic nature of racism (Bonilla-Silva, 2015; Murji, 2007) and its distinguished harm to Black people garnered much attention following the revelation that the rapidly spreading coronavirus disease, initially considered to be an indiscriminate equalizer, was in fact disproportionately fatal for Black Americans (Ellis, 2020; Mein, 2020; Millett et al., 2020; “Too Many Black Americans Are Dying from COVID-19,” 2020). As many grieved this harsh reality, anguish and despair were detonated when video of George Floyd’s murder began circulating through social media and television newsfeeds (Kirby, 2020; Taylor, 2020). This “double crisis” (Webster, 2020) is a continuation of the ubiquitous denigration of Black lives that stretches across 400 years in this land space now known as the United States of America (Davis, 1983; Kendi, 2016; Muhammad, 2010).

The normalcy of anti-Blackness (Dumas & ross, 2016), where Black-ness/people are conceived as subhuman and antithetical to White-ness/people, prompted surprise for many when notoriously insensitive organizations began publishing statements about the impropriety of George Floyd’s murder (Pacheco & Stamm, 2020). Even professional organizations, like the American Society for Engineering Education (ASEE, 2020), released statements acknowledging the implications of these murders on their respective work (Akeru et al., 2020; American Educational Research Association, 2020; Society of Hispanic Professional Engineers, 2020; “Systemic Racism,” 2020). Public statements have their place, though individually we must reflect on how we can disrupt the “pervasive pattern and practice of learned, ingrained, and automatic behaviors” (ASEE, 2020) that do not result in physical death but destroy educational and professional aspirations of Black people. Specifically, the influence of race on the work we do must play a more prominent role in how we approach our work. Instead of practicing color-evasion (Annamma, Jackson, & Morrison, 2017; Neville, Awad, Brooks, Flores, & Bluemel, 2013) and dysconscious racism (King, 1991, 2015), we must develop a personal and professional critical consciousness about racial, ethnic, and cultural factors that influence success for Black people in engineering. In 2020 and beyond, we must embolden efforts for broadening participation, diversity, and inclusion in engineering with a research paradigm that conceptualizes what is necessary for Black people to thrive in engineering (Lee, 2019). The ingenuity of Black people must matter simply because of our human dignity, regardless of any arguments for increasing the quantity of engineers, diverse thought toward technological advancements and global competitiveness, or opportunities for upward economic mobility.

As a Black male educator and researcher, I am keenly aware that the epistemological, ontological, and axiological perspective I (and others like me) bring to the engineering education research community is often rejected if not just neglected or devalued. This realism precedes America’s establishment and has since fueled its existence (Madhubuti, 1994; Shujaa, 1993). Likewise, Wharton (1992) aptly details the ways in which engineering education (i.e., collegiate engineering study) “has been a preserve of the white power structure since its inception” (p. xi). Yet, in

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the spirit of Maya Angelou “I rise,” telling my story (Holly, 2018) as an educative counter-narrative (Hughes & Pennington, 2017; Solórzano & Yosso, 2002a) to elucidate and disentangle the anti-Blackness endemic in engineering education research. With this editorial, I will provide a brief elaboration on anti-Blackness and the ways it manifests in engineering education research; then I present research practices that can help engineering educators conduct research that is pro-Black (the antithesis of anti-Black). In her most recent book, Bettina Love (2019) declares Black lives must “matter not for recognition or acknowledgment but to create new systems and structures for educational, political, economic, and community freedom” (p. 1). As Bettina Love's quote implies, our desire for inclusion goes beyond mere presence and proportionate representation. Black people yearn for educational freedom to engage in engineering with the entirety of our identity.

2 | ANTI-BLACKNESS IN ENGINEERING EDUCATION

For more than four centuries, state-sponsored terrorism and apartheid against Black people have been commonplace, prompting many scholars to insist the uniqueness of the Black experience (on the land designated as the United States) necessitates a specialized framework for inquiry (Dumas, 2016; Dumas & Ross, 2016; Sears & Savalei, 2006; Warren & Coles, 2020). Put simply, Smith (1993) declares, “In America, race matters, but Blackness matters in more detailed ways” (p. 76). Understandably, many may find it hard to conceive, and even more so accept, the idea of anti-Blackness, especially given the proliferation of color-blind racism, meritocratic myths, and misconstrued individualistic ideologies (Bell, 1987; Bonilla-Silva, 2003; Pawley, Mejia, & Revelo, 2018; Turner, 2012). Nevertheless, such unbelief does not make the existence of anti-Blackness invalid. Warren and Coles (2020) describe anti-Blackness as “the socially constructed rendering of Black bodies as inhuman, disposable, and inherently problematic,” (p. 2) which like racism goes beyond interpersonal prejudice: it is the inability of American culture to see Black people as more than slave (Sharpe, 2016), thereby causing active participation or silent complicity in the literal and figurative death of Black people. Because of these anti-Black beliefs and attitudes, the intentions of perpetrators of anti-Black violence are superseded by the consequences of their actions (Singleton & Linton, 2006). Good intentions, which are internal, must be re-positioned as verified by external action rather than as a justification for harmful outcomes.

As early as the 1860s, racial discrimination prevented Elijah McCoy from access to the engineering industry despite his status as a certified engineer. Almost 100 years later, Mary Jackson navigated racism to become the first Black engineer at the National Aeronautics and Space Administration (NASA). It took more than half a century later for Mary Jackson's story to become mainstream via the 2016 movie *Hidden Figures*. Nonetheless, McCoy's and Jackson's remarkable stories showcase not only their brilliance, but more so their ability to overcome racism. Unfortunately, the engineering community, and America more broadly, prefer to popularize a few stories of historic individuals as abnormal instead of placing a spotlight on the racist gatekeeping that prevents the normalization of Black excellence (Cashmore, 2012; Stewart, 2011; Wolfson, 2019). Countless other past and present-day narratives are unknown, “dream [s] deferred” (Hughes, 1990) because the White power structure that dictates success in engineering has deemed us inadequate (Slaton, 2010; Wharton, 1992).

Much less apparent, or perhaps just more acceptable, is the “everyday racism” (Essed, 1991, 2008; St. Jean & Feagin, 1998; Swim, Hyers, Cohen, Fitzgerald, & Bylsma, 2003) that epitomizes anti-Black violence serving as tolerable toxicity within engineering culture. The resilience Black people demonstrate to exist in engineering despite the prevalence of disparagement is astounding (Burt, McKen, Burkhart, Hormell, & Knight, 2016; McGee & Martin, 2011); nevertheless, the failure of the engineering field to recruit, retain, and graduate Black students without racial trauma is yet another crisis. This critical situation is twofold. On the one hand, we as a community must acknowledge and abolish the policies and practices that tear down Black people; on the other hand, we must amplify the policies and practices that favor the assets of Black people. Transforming engineering education research is essential to this effort because we need a proliferation of studies analyzing the impact of unjust power structures that privilege some people and marginalize others (e.g., racism, classism, patriarchy), seeking to illuminate these structures to empower those oppressed by these power relations. In pursuit of “timely and significant improvements in engineering education worldwide” (*Journal of Engineering Education*, 2003) I beseech the (relatively) new discipline of engineering education to commence a research agenda that studies the implications of anti-Blackness to devise more thoughtful and comprehensive resolutions, produced and enforced across the sectors of academia, industry, and government.

3 | PRO-BLACK ENGINEERING EDUCATION RESEARCH

The following list of research practices are not intended to be comprehensive, but rather as a guide to actionable ways research in engineering education can become free from entanglement with anti-Blackness. Although I readily assert anti-Black racism is embedded in engineering culture, there is a conglomerate of higher education institutions that deserve more study as they have been tremendously successful in producing Black engineers despite this harsh reality (Williams, Burt, Clay, & Bridges, 2019). These institutions are known as Historically Black Colleges and Universities (HBCUs). Even though these institutions represent only 3% of four-year, nonprofit colleges, they produce anywhere from 33% to 42% of the nation's Black engineers (Deen, 2019; Owens, Shelton, Bloom, & Cavil, 2012; Spencer, 2020) yet remain grossly underfunded and unrecognized (American Council on Education, 2019; Arnett, 2015; Harris, 2019; Perry, 2019; Slaton, 2010). Pro-Black engineering education research (PEER) should begin by examining how these institutions are able to do so much more with so much less compared to their Historically White College and University counterparts, especially considering "recent research indicates that HBCU graduation rates compare favorably with other (non-Black) institutions when student-level factors are taken into consideration (e.g., low-income students, first-generation student status, and students whose pre-college education was inadequate)" (Postsecondary National Policy Institute, 2019, p. 6). While traditional engineering education research over-emphasizes the inadequate pre-college academic preparation many Black students experience due to an educational debt (Ladson-Billings, 2006), PEER examines what factors ensure success for Black people in engineering when the odds favor their failure (Fletcher et al., 2017; Museum, Ledesma, & Parker, 2015).

The abiding ramifications of anti-Black racism condemn the conscience of our nation. The immeasurable trauma of intergenerational racism is a stark discrepancy between the printed words of the Constitution and the lived realities of those within the lineage of enslaved Africans; the mere avoidance of extermination is a testament to the fortitude and vitality of Black Americans. PEER utilizes theoretical frameworks that reject the tendency to focus on White supremacy when discussing race without mention of enduring Black suppression (Dumas & ross, 2016) and honor the agency of Black people with an antideficit, asset-based lens. For example, Dumas and ross (2016) present Black Critical Theory (BlackCrit) in education as an analytic approach that makes room for the hope and imagination of true liberation, concurrently retaining the recognition that White capitalists were (and continue to be) responsible for constituting dehumanization and the ignominy of Black people. Likewise, BlackCrit in engineering education raises the aspiration for equitable research much higher than proportionate representation to a more humane concept: freedom. There are other frameworks with even more relevance to our discipline like Shaun Harper's (2010) antideficit achievement framework based on his study of Black male college students. Harper provided "an example of how to explore and better understand the enablers of [racial/ethnic] minority student achievement in STEM" (p. 64). Principally important is shifting the viewpoint that shapes the research we do to improve its legitimacy, veracity, and effectiveness in progressing the field toward liberation (Mejia, Revelo, Villanueva, & Mejia, 2018).

Selecting a research methodology is another point in the research process where researchers can choose to be pro-Black in their approach. It may be tempting to solely focus on the system of methods that will elicit a rich dataset without paying attention to the arrangement of power dynamics that are implied when employing a particular methodology, but we must reject this temptation and instead be deliberate in choosing methodologies that generate equitable interactions between the researcher and the research participants. In addition to centering race and asset-framing, our methodologies should make use of interdisciplinary sociological knowledge and uplift the voices of Black people, seeing us as experts of our own experiences (Solórzano & Yosso, 2002b). There is abundant literature about Black people in engineering presented with the claim of objective inquiry, analyses, and conclusions; however, as humans we all possess subjectivities that influence everything we do. Consequently, it would be more profitable for our work if we acknowledged our sociocultural paradigms and described their effect (Ellis, Adams, & Bochner, 2011; Milner, 2007; Starr, 2010). Methodologies like autoethnography and participatory action research eschew conventional research methods in favor of democratizing the research process and affirming the intelligence of research participants in pursuit of transformative exploration.

The final two research practices I will discuss are interrelated and are at the core of PEER, citing the work of Black people and constructing informed research questions. Epistemic appropriation (Davis, 2018) and racially biased citation patterns (Delgado, 1984; Ray, 2018) have doubly disenfranchised Black scholars as our work is under-read and therefore not promoted sufficiently to provide the circulation it deserves. In contrast, White scholars dominate most-cited lists and have their work prominently shared even if they are expressing the same concepts as Black scholars. Regardless of the legitimacy of this White ignorance (Mueller, 2017), the consequence is omission of our work in the mainstream

discourse, and we all suffer as a result. To be clear, my encouragement to cite Black scholars (within and beyond engineering education) does not simply mean to peruse our work for easily extractable quotes, rather to engage our work with an intellectual curiosity that permits deep learning. Moreover, Black research should matter whether its focus is Black lives or not. Reading and intellectually engaging the work of Black scholars will naturally lead to engineering education researchers asking research questions that will move us forward in recognizing and supporting Black ingenuity in engineering. It is necessary to consider what is not fully known, or perhaps overlooked, about the historic (and ongoing) exclusion of Black people in engineering as well as what can be gleaned from the success of Black people in other fields of study that may inform the engineering community toward authentic inclusion.

4 | CONCLUSION

Admittedly, this editorial may read as an overly harsh critique of engineering and engineering education research, but I submit this article with the intention of co-laboring toward a reality whereby Black people can be celebrated as our whole selves within and beyond engineering. The novel coronavirus pandemic and the familiar police murders of Black people coalesced to bring about a rare time of national focus on how Black people suffer from anti-Black racism, prompting dialogue in numerous professional communities. My reflection suggests engineering education research in its current form is largely enmeshed in a perpetual undermining of Black scholarship and life, and I offer several feasible ways our research practices can cease this destructive condition. I possess enormous gratitude for the forward strides that have been made which allowed me to enter and maneuver through engineering collegiate study at multiple levels, especially those by Black trailblazers within whose intellectual lineage I exist. However, I am simultaneously *dissatisfied* with the terror engineering imposes on Black people while being *devoted* to leveraging my skills and expertise in pursuit of innovative solutions to this urgent situation.

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James Holly, Jr.

Division of Teacher Education, Wayne State University, Detroit, Michigan

Correspondence

James Holly, Jr., College of Education—Division of Teacher Education,
 271 Education Building, 5425 Gullen Mall, Detroit, MI 48202.
 Email: james.hollyjr@wayne.edu

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