STUDIES IN ENGINEERING EDUCATION

Cross, K. J. (2020). Black Education in the US: Telling/Understanding Chavone's Story with Integrity and Strength. *Studies in Engineering Education*, 1(1), pp. 74–77.

RESPONSE

Black Education in the US: Telling/Understanding Chavone's Story with Integrity and Strength

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"Reality is known when based in the historical roots of Black feminist thought, embodying a distinguishable difference in cultural standpoint, located in the intersection/overlap of the culturally constructed socializations of race, gender, and other identities and the historical and contemporary contexts of oppressions and resistance for African-American women" Cynthia Dillard (2000) definition of endarkend feminist epistemology.

Keywords: Black Education; Autoethnography; Black feminist thought; K-12; engineering education research

Chavone's story in "Centering the Marginalized Student's Voice through Autoethnography: Implications for Engineering Education Research" by Martin and Garza (2020) is powerful and thoughtful in many ways. It is a story that needs to be heard, but more importantly, a story that needs to be understood by all educators involved with engineering education and research, including faculty, students, and administrators, so that anti-racist practices in U.S. programs and research move forward. Chavone's experiences and many recent events demonstrate the inequities in higher education. For example, recent threats to international students resulted in a national outcry and to leading universities suing the Federal Government. However, the lack of domestic diversity in higher education has yet to outrage the country. The lack of Black, Indigenous, and People of Color (BIPOC) students in higher education has become an **accepted reality** and one that is amplified in STEM fields. Martin and Garza provide an essential "in your face" reminder that we have a long ways to go before we achieve domestic diversity, equity, and inclusion in engineering, higher education, and in our current K–12 system. The authors also set an exciting precedent in engineering education research (EER) addressing diversity, equity, and inclusion (DEI) by explaining the reciprocal roles each author performed.

Chavone's story highlights two major themes that speak to anti-racist practices in U.S. engineering programs and engineering pedagogy that I would like to explore in this commentary. First, her experiences contain implications for administrators, program directions, and department chairs who are advancing anti-racist practices in U.S. engineering programs and second, Chavone's story highlights the focus on objectivity and normalized data in our approach to engineering education research that addresses deeply rooted incompatibilities engineering has with concepts of DEI. There are many moments in this excellent article where I agree with the authors, but also places where I would challenge the authors and readers to expand their understanding. There are also places where I think the authors are explicitly encouraging us scholars to update our perspectives of DEI given our current social climate. These challenges are especially important if we as engineering educators and scholars are serious about the inclusive excellence needed to move our field forward.

First, noticing how Martin and Garza choose to center Chavone's voice pushes us to acknowledge how essential centering the voice of the oppressed throughout all of K–16 education is. This is an example of what Dillard called an "alternative version of the research relationship" (Dillard, 2000, pg. 663). Centering the voice of the oppressed challenges the long-held notion of meritocracy and the unacknowledged normative standard of "knowledge" and value of information. The authors rightly point to these counter-narratives and define them as legitimate knowledge which expands whose perspective is seen as valuable for engineering. Furthermore, the myth of meritocracy in engineering is well documented by other scholars (see Cech 2013; Seron 2018). Therefore, stories like Chavone's helps the educational research community unpack deeply held beliefs that allow systemic racism to persist in our educational institutions.

We must also collectively work to acknowledge and embrace the cultural characteristics and competences of minoritized students as valued assets in higher education broadly and in engineering more specifically. Chavone describes how unsolicited identities were given to her, illuminating how the current educational system built with structural racism imposes

identities onto students of color that are neither accurate nor generative. Additionally, we, as a community, must jointly recognize the multiple failed urban education models that have included separate but equal policies and the desegregation programs in the 1990s. Scene 2 offers evidence that students of color should not held accountable for an educational system that was not designed for their success. The need for all university faculty and staff as well as high schools counselors to be required to have bias and multicultural awareness training is terribly obvious based on Scenes 2 and 5. Scene 3 illustrates the need for outreach into K-12 programs to expose students like Chavone to the fields of engineering as Chavone was an adult before she had an accurate understanding of what an engineer is and does. Furthermore, Chavone's multiple interactions which were filled with unfounded assumptions (i.e., bias) and microaggressions suggest the importance of having diverse staff in offices and other places where students interact with the academic institution gatekeepers. In moving forward, we should consider institutionalized incentives or rewards for academic units, which garner the fewest, reported bias events as a part of annual assessment.

Despite the numerous previous examples where I agree with the authors, there are a few places where I would push them to expand their understanding especially as connected to how we seek to "solve" the so-called "problem" of students coming from schools lacking privilege and what kind of interventions these students need once they are enrolled in college. First, Chavon's K–12 experience is not "unique" in that most urban Black students experience similar obstacles, many of which are unnecessary and unforeseen (See Shame of the Nation by Kozol and Blanchett 2005). I personally experienced the desegregation program in an urban city that sensitized me to racial and SES inequalities early in life. We are now observing the results of decades of education experiments in major cities all over the United States that have negatively impacted the access to education and the attainment success of students of color (see Howard 2019).

In this current climate calling for an end to systemic racism, we must also hold our education system under the same scrutiny for continuously failing the majority of students of color. While I generally agree with taking an asset-based approach, rather than a deficit-based approach, which overwhelmingly focuses on fixing broken students, I do not believe that all/most Black students and other students of color are broken. As critical race theorist would suggest, it is the system in which they are forced to live and learn that are broken. However, I do want to point out that we should be careful as to what characteristics we identify as assets. Although I do not think it was the authors' intention in this article, we as educators and researchers should avoid labelling characteristics of resilience and perseverance as assets if doing so allows the educational system to remain unresponsive to the needs of marginalized and underrepresented groups. These unintentionally negative results or *mischaracterizations* led the medical field to accept the notion that African Americans possess higher pain tolerances than other racial groups and this deeply harmful bias is still present in the medical system today (Hoffmann 2016), resulting in negative health effects for Black patients in every field of medicine. This is also evidenced by the current COVID-19 pandemic data showing the disproportionate impact on African Americans (Yancy 2020). Therefore, we should carefully consider what we declare as an asset for students of color in engineering.

Martin and Garza posed multiple questions I think are quite valuable if we are willing to continue to address and continue to adopt an anti-racist approach to education in the US. First, the authors asked: how do academia and funding agencies limit the type of research that is anti-racist? That is great question because we already know that bias in journals limits the tenure and promotion of women and faculty of color (Aguilar 2019; Benson 2020; Knobloch-Westerwick 2013). The hypocrisy of higher education and of engineering more specifically is that we talk about valuing diversity, but we do not support or value scholarship about diversity, produced by diverse scholars. There is little accountability to curve these known biased behaviors. Similarly, how do funding agencies formally support the development of diverse scholars? Anecdotally, individual try to support early-career faculty of color in engineering education, but is this practice sustainable and do these few individuals functionally create a pipeline? For example, to my knowledge, no program exists at any federal funding agency to support scholars of color developing grant writing and management skills, which are important for any academic career.

Secondly, Chavone's experience raises the question of how can we remove well-entrenched institutional financial barriers that may seem inconsequential to the average engineer with power and privilege? Admission fees, only accepting online payments and other policy barriers such as the amount of time required from dropping out of high school to one's eligibility for the GED and academic documentation were cited as just a few barriers that students face (HiSET 2020) as they pursue higher education. Given the financial strain on members of underserved groups, exacerbated by COVID-19 right now, these financial barriers can increase the number of students that never enter a pathway to higher education or engineering. Additionally, based on Chavone's story, the authors provide useful policy recommendations to create emergency funds for students, but educators would benefit from more details of the process for students to gain access to the emergency funds.

The methodology of this article is another one of its most important implications. Its methodology directly challenges us as engineering and engineering education researchers about our approaches to researching diversity, equity, and inclusion. One of the impacts of the co-authorship of this article can be seen in how making analytical decisions to exclude context not critical to the manuscript occurred (pg. 16). The study fulfills all the quality standards of qualitative research in EER and thus should be considered valid. The description of the process and product are useful for other researchers to follow

the procedure. The authors illuminate a process where the researcher and the participants each describe their positionality, acknowledging power and privilege that they brought with them to the work, rather than speaking in generic identity terms. Furthermore, the joint section on the data collection description is important in that it highlights what each member contributed to the team (Julie and Chavone section). As mentioned, this research methodology is consistent with what Dillard (2000) proposed, to remove the old model of the researcher and the researched relationship to co-construct novel more accurate interpretations.

Finally, the authors provide evidence of the role of procedural justice in engineering education research addressing DEI. Procedural justice is concerned with the fairness and the transparency of processes through which decisions are made. Procedural justice in academia has typically been considered only in relation to performance evaluations (O'Connell 2019), classroom justice (Chory-Assad 2004) and engineering ethics (Maqsoom 2020). The authors offer examples of procedural justice in multiple places throughout the article. First, specifying Chavon's experience as legitimate knowledge and expertise about her own experience is critical to broaden what is seen as valid evidence in EER addressing DEI. I appreciate that the authors problematizing the dichotomy of legitimate versus illegitimate knowledge based on Eurocentric definitions that often further marginalize people of color (Zuberi 2008). Another component of procedural justice in this article is seen when both authors emphasize the importance of participant defined critical incidents and the importance of negotiating coauthoring. The third piece of procedural justice in the paper is the disclosure that Chavone checked in with her mother to verify that was it ok to reveal highly personal family struggles in the paper. This is a key aspect of procedural justice because it seeks to make sure that the work is not re-traumatizing any of the actors in the narrative. A final implication of this work on EER addressing DEI is the notion that we as engineering educators need to do more research on assessment variation and the impact of culturally responsive pedagogy (CRP) in STEM classes. Although multiple engineering education scholars of color, including myself, have suggested the adoption of CRP into the engineering curriculum, in reality, there has been very little adoption and this needs to change now.

Overall, the article is timely and relevant given the recent tenor of race relations in the United States and the blatant hostility towards people of color and women. There are a few places where I would encourage the EER community to keep working beyond the challenges made by Martin and Garza in this article. First, research addressing DEI should avoid singling out identities of marginalized students and making students of color feel like guinea pigs. For example, Chavone embraced this intentional unpacking of her personal experience, but not all students of color will be in the same place. If you cannot provide a physical, emotional, and psychological and intellectually safe space for a marginalized participant, then collaborate or seek advice to create the space. Engineering education researchers addressing DEI should avoid what sociologist refer to as *pluralistic ignorance.* Pluralistic ignorance occurs when groups unwittingly reinforce the misunderstanding of situations because people hold unwarranted assumptions about the thoughts, feelings, and behavior of others (Mueller 2018). In other words, make sure you check your own bias before trying to help a member of a marginalized or underrepresented group; go through several rounds of bracketing. Take the approach suggested by Martin and Garza, Dillard (2000), and universal design scholars (Burgstahler 2015) to work with the target population. Two additional questions, I would have like to see the authors address are: 1) does this process work with other qualitative research methods (e.g., phenomenology, case study, or ethnography); and 2) what mental health support for participants is recommended after engaging in data collection that could potentially re-traumatizing participants? For example, in my study about undergraduate students' stress (Cross & Jensen 2018), the Institutional Review Board (IRB) required us to provide contact information for several mental health professionals. It is my hope that we will see many more studies like this one in the near future and embrace accountability to the participants we study and claim we wish to support. As we move forward, I encourage us all to embrace the tenets of endarkened feminist epistemology (Dillard 2000) and narrative agency (Secules 2018), in EER addressing issues of diversity, equity, and inclusion.

Competing Interests

The author has no competing interests to declare.

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How to cite this article: Cross, K. J. (2020). Black Education in the US: Telling/Understanding Chavone's Story with Integrity and Strength. *Studies in Engineering Education*, 1(1), pp. 74–77.

Submitted: 05 November 2020 **Accepted:** 06 November 2020 **Published:** 21 December 2020

VIRGINIA TECH | VT Publishing

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