

Suit Up: The Archetypes of Leadership that Allow Black and Latinx Engineers to Succeed

Angel Nyaga¹, Katreena Thomas² and Brooke Coley PhD²

¹Carnegie Mellon University, ²Arizona State University

Introduction

There are preconceived notions of what an engineer should be. Though we are living in a growingly diverse world, engineers are often assumed to be seen as “white men with a monolithic point of view” [2]. This image has created an exclusive environment through discouraging the participation of people of color and discouraging diversity of thought. This discouragement has placed serious limitations on the progression of the engineering field due to its limited perspective on problems that effect more than just the predominate group in the field.

Black and Latinx engineers in leadership positions encourages their success in the field and have the power to provide the field with the perspective it desperately needs. While diversity of students, staff, and thought are crucial to expanding the perspective of the engineering field, this perspective can only be provided if it is accepted by individuals in the field. Leaders ability to inspire others to believe a mission or aim for a particular goal equips marginalized engineering leaders with the skills to provide the perspective shift that is needed in the engineering field [5]. Leadership also equips marginalized engineer with the skills to reach levels of success that wouldn't have possible for other marginalized engineers. This study established archetypes of leadership that allow Black and Latinx engineers to succeed in the field. In this context, success is defined as the academic and professional success, excluding satisfaction in the field.

Background

Marginalized in Engineering

History is full of examples of the exclusion of Black and Latinx students from the engineering field. From times in which Black and Latinx individuals were not given opportunities for education in this country to the early stages of school integration, the white history of the engineering field can be traced back to prejudice and discrimination [2]. While society has continued to make efforts to step away from this school of thought through diversity and inclusion initiatives, the admission and hiring of more Black and Latinx students, and more, the disapproval of Black and Latinx engineer presence in the field shows more work needs to be

done. This disapproval can be seen by the microaggression Black and Latinx students face [1], the lack of adequate support given to Black and Latinx students [1], and the low retention rates of Black and Latinx students compared to their White peers [1].

What makes a leader?

The principles of leadership equip Black and Latinx engineers with the skills necessary to make it through the engineering field. Leadership is centered around inspiring others to reach a shared goal [5]. While this is often confused with management, true leadership involves balancing the needs of a group and the requirements of a goal to produce the best experience and outcome [5]. This involves skills of management, like delegating and assigning tasks, and less discussed skills like communication, understanding, and empathy. Such broad characteristic makes it so leadership can come in numerous shapes and form. If done effectively, this form of leadership can provide levels of sustainable efficiency that can set a team on the path to prolonged success [3].

Theoretical Framework

The framework racial identity theory allows for an understanding of races' connection to an individual's experience in the field. Racial identity theory examines the significance an individual places on their sense of belonging to their race. Participants' connection to their race can be used to assess how views towards race affect participants' engineering journey and choices as a leader. Such an understanding will help establish the extent to which race can affect an engineer's choice, perspectives, and contribution to the field.

Intersectionality as a framework allows for an understanding of the all-encompassing factors of leadership and how different intersections of identity effect actions as a leader. Intersectionality is centered around accepting that a marginalized group is not a monolith. Different aspects of identity, such as race, socio-economic status and gender, work together to create unique forms of discrimination. While this study establishes archetypes for Black and Latinx engineers, these archetypes were built with the freedom to encompass the perspectives of different Black and Latinx engineers.

Methods

This qualitative study aims to address the research question: What archetypes can Black and Latinx engineering students apply to be successful in their fields?

Data Collection and Reduction

This study focuses on the stories of five Black and/or Latinx engineering students and young professionals. Their stories provided insight on the experience of Black and Latinx individuals in engineering education and the professional world. Semi-structured interviews lasting between 1-2 hours were conducted. Each interview was audio-recorded and transcribed. Of the five participants, one was a graduate student and the remaining were young professionals. Two identified as men, two identified as female and one identified as femme-presenting. Their majors included mechanical engineering, civil engineering, chemical engineering, and industrial engineering. Thematic analysis was used to identify leadership archetypes and how their display of leadership allowed them to succeed in their engineering discipline.

Positionality

As an undergraduate black woman in engineering with leadership experience, I can identify with the students in this research. Not only have I witnessed the monolithic engineering environment, but I have used my leadership skills to help me through the field. This has allowed me to relate to the harsh circumstances some of these participants face and gain a deep understanding of how they navigated these spaces through engineering. While these participants are all above my level of education and career placement, a focus on their overall experience in engineering and interacting with researchers in their positions allowed me to assess their circumstances fairly. Additionally, due to my similar experiences to some of the participants, I complete reflective memos to get an unbiased approach to the data.

Findings

Different forms of leadership exist for Black and Latinx engineers. While this group shares the experience of being marginalized within society and in engineering, different aspects of their identities created different forms of leadership for them to exclude. This study revealed two categories of leadership. The first category is traditional leadership. This category is defined by its connection to what society views makes a good leader such as charisma, being social, strength, and having extensive leadership experience. This presented one archetype with the same name and description as its category. The second category is non-traditional leadership. This category is defined by its subtleness and personalization. These individuals use traits such as observation, personal connection, and introversion to inspire others to a particular goal. This category contains two archetypes: proactive leadership and self-preserving leadership.

Traditional Leader

Traditional leaders are often what come to mind when you think of a leader. They are outspoken and charismatic, they naturally take charge of situations, and they are at the center

of a team. This group of leaders is able to use the spotlight they have to inspire others to succeed. Jessica showed an example of this when she discussed her involvement as an undergraduate engineer. She says:

“So I ended up joining Delta [Historically Black Sorority]. And then after maybe like a year after that I did [campus-wide sorority council] because they needed help....I did that for a little...I joined modeling board [part of college government organization]”

Jessica’s continued interest and success in different organizations proves a pattern of successful leadership. Traditional leaders' ability to be social and captivate an audience allows them to take on numerous leadership roles and continue to see success in them. However, as marginalized engineers, this group faces unique struggles. This group often feels out of place in engineering. Their difference in racial identity combined with their difference from the soft spoken and lack-of-social-skills view of engineering students makes people automatically view them as out of place in the field. Gabrielle shared a similar experience when discussing her experience as a young professional in engineering. Gabrielle says:

“...oh, you are so social. You’re so personable. Are you sure chemical engineering is the right field for you?....I felt as if my natural leadership inclination as well as my rigid worlds that is STEM from the predominantly male, white previous ecosystem.”

Though this archetype is questioned for its presence in the engineering field, their natural ability to inspire a group towards particular goals provides them with a place in the field and the opportunity to expand perspectives.

Proactive Non-traditional Leader

Proactive non-traditional leaders are driven by their need to solve individual goals. While they share the same drive to problem solve as traditional leaders, they are not equipped with the same natural charisma and leadership experience as traditional leaders. They simply see a problem in their environment and choose to execute what’s necessary to fix it.. Examples of this form of leadership can be seen with Dad. He says:

“...there was no active [company branch of Latinx young professional organization]....I expressed my concerns to some other coworkers here and one of them actually put me in touch with another woman who had similar thoughts.....we founded [company branch of Latinx young professional organization] and I am the current president.”

Dad's journey to becoming the president of his company's branch of the Latinx young professional organization shows key elements of what it takes to be a proactive non-traditional leader. Dad's interest in starting the chapter was due to seeing a problem and wanting to be someone who contributes to solving the situation. While Dad may be inexperienced and not contain all the traits that may make him as captivating as traditional leader, his drive to create the chapter allowed him to be successful, shown through Dad being the sitting president of the organization. These leaders also have the ability to inspire others through being a role model of the goal they hope to achieve. Killau relates to this experience as he recalls his leadership experiences. Killau says:

"I'm the kind of person that's just like, I'd rather just get it done and do it. I think a lot of people look up to that...people see that and kind of put me in a position where it's like, oh, he must be a leader because he's getting it done."

Killau's ability to be a leader by example shows the power of proactive non-traditional leadership. While Killau did not mean to inspire the other members of his university organization, he's behavior within the organization encouraged others to do the same for the organization. This action has the potential to create good habits that push a team toward their goals.

Self-preserving Non-traditional Leader

Self-preserving non-traditional leaders are defined by their ability to overcome difficult circumstances while maintaining their identity. Due to the harsh environments that often surround this type of leader, they are able to use their unique traits to find creative solutions. This involves traits such as observation, active listening, and building one-on-one connections. While their impact may be hard to see, they nonetheless have the ability to drive people to meet goals. Jae demonstrated this leadership style while going over her experience in the professional engineering world. She says:

"...sometimes some of the trade contractors are definitely more abrasive and like, trying to tell you what they know, over listening to what you're trying to tell them...they're quick to jump down your throat or quick to try and tell you no, before getting your side of things, so I have to be able to kind of on the fly adapt to them."

Jae's use of her unique personality traits allowed her to inspire other people within her field. Because of the preconceived notions other co-workers had of her, Jae couldn't directly inspire them to complete a goal. Instead, Jae had to use skills not often associated with leadership such as active listening, trust, and reassurance to build her coworkers confidence in her ability and encourage coworkers to meet the goals of their projects. This leadership allows

them to expand the perspective of some of their co-workers and lead their co-workers to particular goals.

Discussion/Takeaways:

The establishment of these archetypes is an effort to allow black students to succeed in a field that is not designed for them. While this study shows ways in which they can succeed, it begs a bigger question on how we should be defining success for black engineering students. Within this study, success is defined by the ability to gain academic and professional success despite obstacles that set them up for failure. However, despite 'success' of students with these archetypes, they often struggle to find motivation to stay in their field due to the challenges that continue to present themselves as they continue with their careers. More research should go into eliminating these obstacles so success can be redefined with satisfaction in the field included.

References

- [1] McGee, E. O. (2016). Devalued Black and Latino Racial Identities: A By-Product of STEM College Culture? *American Educational Research Journal*, 53(6), 1626–1662.
<https://doi.org/10.3102/0002831216676572>
- [2] Mobley, C., Brawner, C. E., Brent, R., & Orr, M. K. (2021, January 24). *The centrality of Black identity for Black students in engineering*.
<https://peer.asee.org/the-centrality-of-black-identity-for-black-students-in-engineering>
- [3] Klassen, M., Reeve, D., Evans, G. J., Rottmann, C., Sheridan, P. K., & Simpson, A. (2020). Engineering: Moving Leadership From the Periphery to the Core of an Intensely Technical Curriculum. *New Directions for Student Leadership*, 2020(165), 113–124.
<https://doi.org/10.1002/yd.20373>
- [4] Thomas, K., Coley, B. C., Greene, M. L., & London, J. S. (2021, January 24). *ASEE PEER - Black Faces, White Spaces: Understanding the Role of Counterspaces in the Black Engineering Graduate Student Experience*.
<https://peer.asee.org/black-faces-white-spaces-understanding-the-role-of-counterspaces-in-the-black-engineering-graduate-student-experience>
- [5] Thomas, K., (2022). American Society for Engineering Education 2022 Annual Convention- “Is this good for me?”: exploring the experiences of black engineers in leadership.