Space, Place, and Face of Black STEM in Kansas City Metroplex
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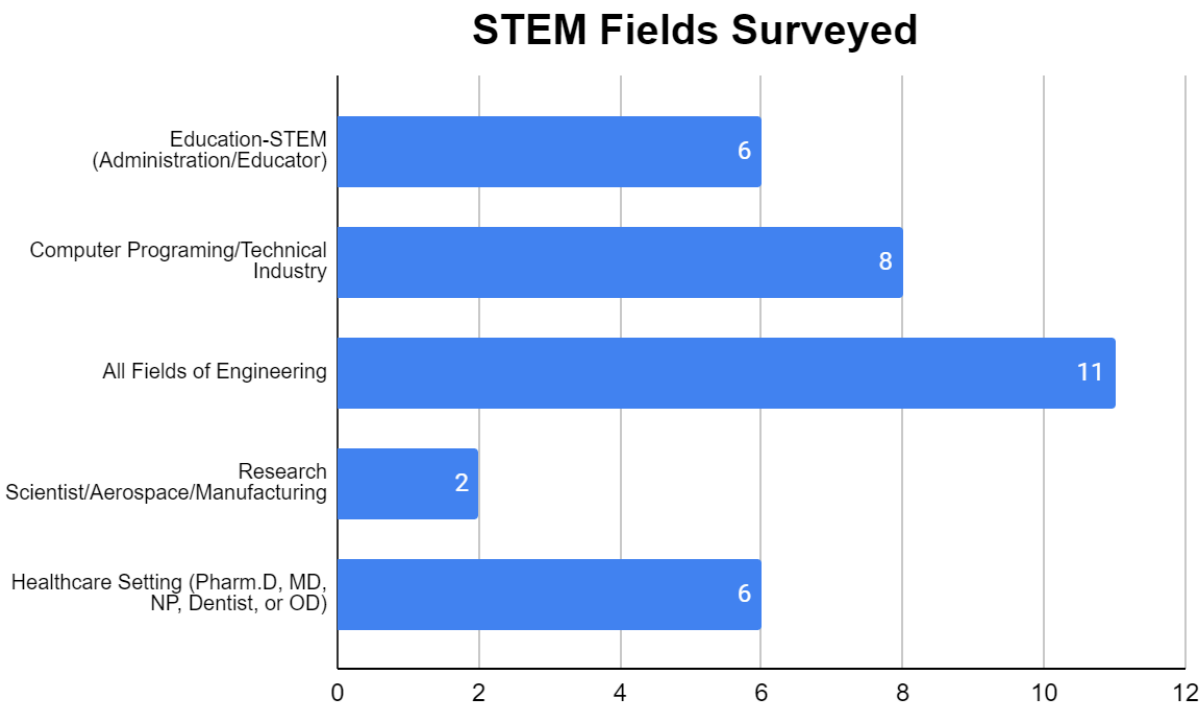
The pioneering work of board-certified radiologist John F. Ramos and the pharmacy entrepreneurship of G. Lawrence Blankenship serve as a springboard for success for Black professionals in Science, Technology, Engineering, and Mathematics (STEM) in the Kansas City Metroplex. In the STEM ecosystem, the purpose for all contributors must be simple: creating healthy workplace dynamics that provide Black individuals in STEM with thriving opportunities. Black STEM Professionals (BSP) can utilize STEM spaces to enhance economic mobility, reduce the wage gap, and promote income stability (Gao et al., 2025). For example, careers in Information Security Analysts and Industrial Engineers are projected to grow at 32.8% and 18.2%, with average salaries ranging from $89,000 to $ 91,000 in the Kansas City region (Meric, 2020). STEM careers will grow 8-35% over the next five years. A qualitative and quantitative applied research study, guided by a theory of change framework, highlights how BSPs feel valued and perceive microaggressions in the workplace, as well as what it takes to positively impact the burgeoning STEM workforce.

33 BSP's careers surveyed are shown in Graph 1.



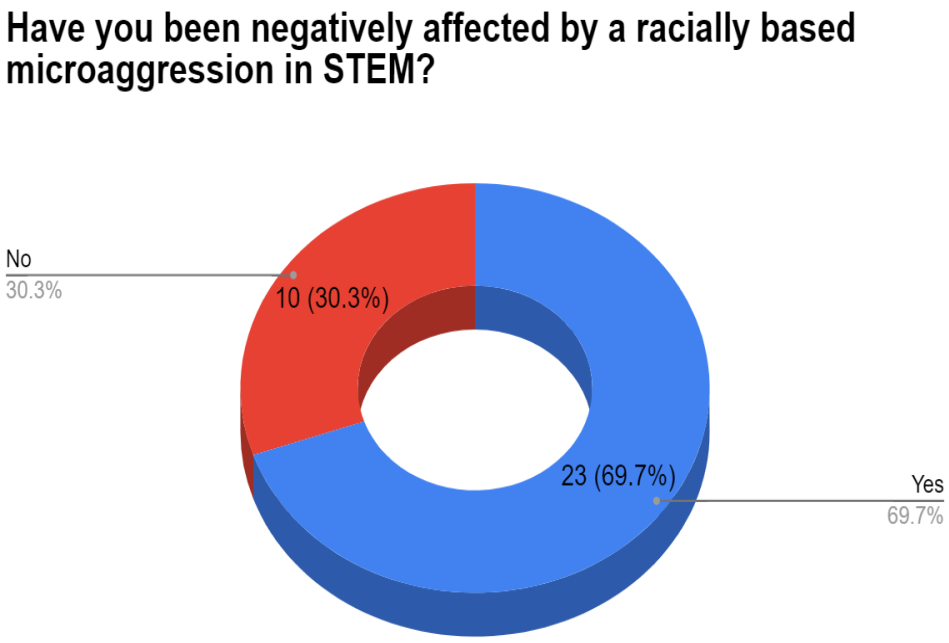
Graph 1. Participating STEM Fields

Effects of Microaggressions in the Workplace

Engineering fields represented 33% of respondents, followed closely by Information technologists or computer programmers (24%). Three other fields shown in Graph 1 provided more insight into the spectrum of BSPs in KC. BSPs are a small percentage of minorities in the STEM workforce in non-progressive companies; this can lead to isolation when seeking mentorship or accountability partners. Food Chemist Hallie Weaver, an HBCU alumna of Langston University, began her career in Kansas City; she encountered microaggressions in the workplace, which she attributes to her gender, age, and ethnicity. Colleagues would "credential-check" her to see how she arrived at her position or would diminish and silence her in roundtable discussions. This led her to leave that job and pursue a more inclusive STEM workplace that championed her

diversity and included her in the process. There she would thrive, by contributing to the creation of a novel product that surpassed its projected goals within months.

Of the thirty-three respondents, thirty-one (91%) said microaggressions exist in STEM. As shown in Graph 2, 69.7% reported being negatively affected by microaggressions, and juxtaposing this data with 30.3% of Black STEM professionals (BSP) feeling that their cultural identity is not considered a value-added attribute in the workplace. This can perpetuate feelings that workplaces are not welcoming to entry-level BSPs and deter veteran BSPs from recruiting others. This, over time, will lead to a downward trend in employment for BSPs in Kansas City and have an adverse ripple effect on their overall upward economic mobility. It can also lead to an "armour-up" like behavior where BSPs begin to protect themselves from perceived harm in the workplace. This may appear as information hoarding, or they start to practice idea-shielding instead of idea sharing. One participant said they would "only share ideas with colleagues they considered safe or trusted."



Graph 2. Microaggressions in the Workplace

On the opposite end of the spectrum, BSPs could be emboldened to volunteer and advocate for their STEM profession during personal and employee-related events. The data suggest that this is occurring amongst 61-68% of those surveyed. BSPs shared how they engage in individual and employee-based outreach activities six or more times a year, as shown in Figure 1. Arguments can be made that challenging workplaces can be either empowering or fatiguing, leading to the novel term "Black Fatigue" (King, 2021; McGee, 2021). Black fatigue is primarily linked to racism but boils over into the feeling of having to overwork or be all things to all people. These feelings can cascade into racial battle fatigue or even burnout. Those situations, as mentioned earlier, are causes for early retirement or the exit of BSPs from lucrative employment during their premium years (Franklin, 2019; Quaye et al., 2019). They also believe that BSPs are responsible for the cultural change, and BSPs must change the culture by serving as a welcoming beacon for

more Black individuals to enter the profession. This, coupled with the feeling that their blackness is not seen and valued in the workplace, can have deleterious health effects, such as workplace anxiety or conflict avoidance. However, despite the burden of doing more to turn the cultural tide to ensure a healthy workplace, respondents reported an overall average workplace joy of 4.3 on a 1-5 Likert scale (1 = low and 5 = high). This harkens that even through challenges and Black Fatigue, there is a sense of aspiration for BSPs in the Kansas City region.

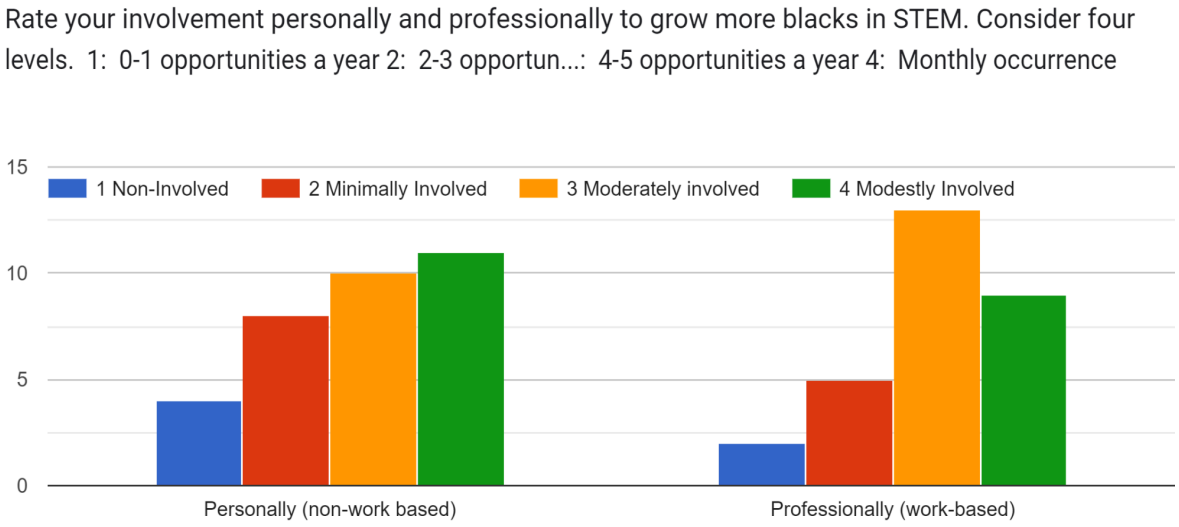


Figure 1. Involvement in Efforts to Increase BSP

Current Strategies Promoting STEM in KC

Victoria Weaver thrives in her career as a Network Security/IT Analyst for a Fortune 100 company. While at Metropolitan Community College, Kansas City (MCCKC)-Penn Valley campus, she was exposed to a nurturing atmosphere provided by the TRIO program on campus. They taught her how to advocate for herself, recognize her worth, and broaden her career vision. **TRIO programs**, a federal government-funded initiative

to support underserved higher education students, have an acclaimed record of improving STEM persistence among **Black Women (Roby, 2019).** TRIO was the impetus for Victoria to shift to Cybersecurity when she transferred to the University of Central Missouri and became the first black woman to earn a B.S. in Cybersecurity from UCM. From there, she encountered microaggressions in the Kansas City workforce. These microaggressions appeared subtly at first, in the form of simple questions about where she was trained or how long the program she completed had been established. These subtle nuisances, although considered benign, were not; they made conversations combative, diverting energy from the workplace to the practice of avoidance. However, these negative slights were not permanent because her employer championed **diversity through cultural affinity groups.** These affinity groups used micro-affirmations to empower and reaffirm her place, space, and face in the workforce. Micro-affirmations instill a greater sense of belonging (Franklin, 2019). Through the affinity group, she had support and guidance to navigate strenuous situations. These supports unlocked a hunger to bring her whole professional self to the workplace and transitioned a workforce into a lifeforce. A place where a BSP's value to the ecosystem is needed and drives positive outcomes that then reciprocate into the feedback loop of the continuous improvement process. Now, that company has three affinity groups that mentor and incorporate best practices to nurture brave spaces for Black STEM professionals.

Access to opportunity matters, and with the Kansas City region's historical ties to the Sprint Corporation, a telecommunications titan, there is a cache of Black individuals active in Information Technology in Kansas City. The wealth of academic capital can serve as social capital for generations of BSPs, both currently and in the future. However,

for our youth to effectively access opportunities, they need broadband access. A catalyst in this area is **Kansas City Councilwoman Melissa Robinson**, an entrenched warrior for equity for underinvested populations in Kansas City. She enacted policy and helped secure funds through a public-private partnership that removed barriers and championed the involvement of Blacks in digital citizenship through high-speed broadband and Wi-Fi access. Another example of the social and academic capital of BSPs in Kansas City is the work of WeCode KC **Co-Founder Tammy Buckner**. They conduct urban coding camps and practice a Kindergarten through College, sometimes called the Cradle to Career mentorship model, focusing on computer literacy year-round. Work like this eradicates a term like **"~~Jim Code~~,"** which relates to the segregation of BIPOC (melanated people) from digital citizenship and even being non-existent to some artificial intelligence instruments (Benjamin, 2023). BSPs must be present, seen, and active to proliferate BSPs in the Kansas City Metroplex.

The Way Forward for STEM in Kansas City

Figure 2 illustrates where the energy and momentum exist for improvement upon the current outreach to increase BSP. Salient themes emerged from qualitative responses referencing entities such as **JE Dunn** and **Black Achievers Kansas City** for their current efforts. Additionally, hosting the National Association of Black Engineers in 2023, which drew over 12,000 visitors to the Kansas City Metroplex, is a pivotal way to ensure a pipeline of Black professionals is aware of opportunities in Kansas City. This is a way to promote self-efficacy amongst the workforce pipeline by having vicarious experiences. Four items to focus on going forward are provided:

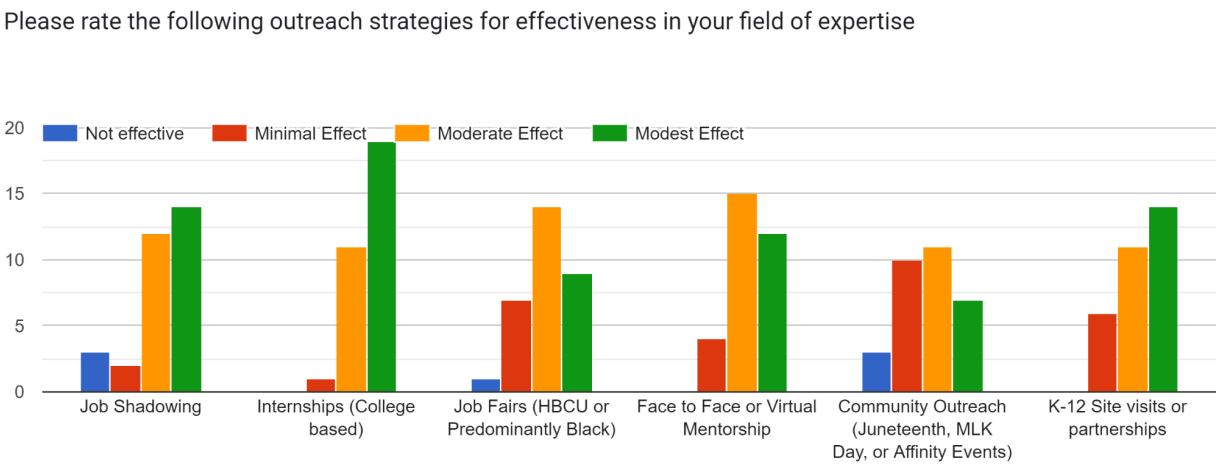


Figure 2: Effectiveness of Outreach Strategies in STEM Fields

- JE Dunn's work provides fertile ground for Black individuals to thrive in STEM, a theme that consistently emerged during qualitative remarks. The Blacks United in Learning and Development (BUilD) program supports Black professionals by providing mentorship through a matching process that emphasizes cultural insights. When career opportunities arose, they were onboarded in a manner that supported their early-stage career mobility (Bakker et al., 2023).
- Internships, K-12 Partnerships, and Job Shadowing are key contributors to our progress. One strategy could be INROADS, where 83% of interns involved are Black; their work aids in job shadowing and internships in STEM careers. However, no active chapter exists in the KC Metroplex. There should be a regional effort from the municipal government, the private sector, and all levels of education to recruit the **INROADS program** in Kansas City. Another strategy that emerged was to recruit **Year UP** into the Kansas City market as a workforce strategy that serves as an upward economic mobility driver, focusing on

18-29-year-old residents who have not yet earned a bachelor's degree and currently earn a low to moderate income (Britt et al., 2023).

- Job fairs and Affinity-Based Events marketing will need to be explored to ensure that a higher return on investment is gained, but efforts must continue.
- There are only six full-time Black Professors in higher education in STEM fields. Effective grant-writing is necessary to fund, staff, and implement more TRIO programs in higher education, as currently, only six are active in the Kansas City Metroplex. Additionally, there is a greater emphasis on grant writing that spurs the recruitment and retention of BSPs in the Kansas City Market.

Limitations of the Study

Researcher bias was mitigated through external review and critique, ensuring adherence to best practices and a theory of change framework, as well as the need to analyze parameters statistically (Johnson & Christensen, 2019; Neuhäuser & Bretz, 2001). The study was centered on and focused on the Kansas City metroplex, and its scope was limited to social media outreach through convenience sampling. The study is considered a preliminary study to create the impetus for a more comprehensive and national study. Qualitative interviews of two participants were recorded by one researcher and transcribed by a research associate; this will need to be expanded to mitigate researcher bias. The terms' moderate' and 'modest' impact on survey questions warrant greater detail when explained to participants to ensure that data quantification and analysis improve in future studies, both regionally and nationally.

Conclusion

The path into STEM in Kansas City has many vectors. Not only were the Black STEM Professionals mentioned earlier forerunners in STEM, but they also employed political and social advocacy strategies to ensure the progress seen now. Convening stakeholders, coupled with an evaluation of previous work done in the metroplex, is imperative. However, stakeholder recruitment for the four approaches must be leveraged across the private, non-profit, and public sectors, followed by asset mapping and expansion beyond the Kansas City Market. Black STEM professionals stand on the shoulders of a rich legacy entrenched in resilience, but why must there be roadblocks and hurdles in STEM that attenuate their academic prowess? Therefore, as Blacks navigate STEM spaces, they must recognize those who under**stand** the cause. But, they must not **stand** by or **stand** back and ponder who will champion the cause in Kansas City. They must **Stand Black** so the path is well-lit to continue the journey.

Acknowledgements

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Supporting Information

Survey Link

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