Show up and Show out, Young Homie: Performative Assimilation for Black Boys in the Face of Anti-Blackness in Informal STEM Environments

Kareem Edouard, Taquan S. Stewart, Ed.D.

Kareem Edouard
School of Education, Drexel University
ke388@drexel.edu

Taquan S. Stewart, Ed.D.
Regional Managing Clinical Director, Alder Graduate School of Education
tstewart@aldergse.edu

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The Black Educology Mixtape is an open-access mixtape that moves beyond academic articles to feature various art forms and voices that are typically muted. We feature a collective of Black people working to amplify and empower Black educational voices. Our scope and sequence focus on the past, present, and future of Black education, which has been historically and systemically caught in the underbelly of western education. Our work is grounded in creating mixtapes that are both revolutionary and emancipatory in the name of love, study, struggle, and refusal.

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Show up and Show out, Young Homie: Performative Assimilation for Black Boys in the Face of Anti-Blackness in Informal STEM Environments

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**Abstract**

The main objective of this track was to investigate the complex identity negotiations that Black boys face in informal STEM learning environments. This track is dedicated to offering concrete solutions and insights, illustrating how the confluence of diverse identities impacts and molds the experiences of Black boys as they journey through these educational landscapes. Through this exploration, the track intends to illuminate the distinct challenges and prospects Black boys face in engaging in informal STEM environments.

**Introduction**

**Black boy, Black boy** turn that shit down
You know that America don't wanna hear the sound
Of the bass drum jungle music go back to Africa
Nigga I'll arrest you if you holding up traffic.

-Born to Roll, Masta Ace

Master Ace's lyrics articulate an internal conflict that young Black boys evolving into Black men harbor due to the inability to manifest their full cultural identities amidst pervasive anti-Blackness in America (Akom, 2009; Carey et al., 2022; Noguera, 2003; Stovall, 2016). The lyrics "turn that shit down" symbolize the widespread societal efforts to quash Black cultural manifestations (Cose, 2003; Eberhardt et al., 2004). When Black boys enter informal STEM spaces, there's an inherent feeling suggesting that they "go back to Africa" or wherever they're assumed to come from. It's as though these spaces are not meant for them. This sentiment reinforces the feeling that Black boys, particularly in STEM environments, are treated as perpetual outsiders, irrespective of their academic potential or contributions to advancements. We introduced the lyrics to ground the conversation on how some Black boys feel when social constructs in a classroom limit them to their culture, rendering them unable to fully participate and authentically represent their culture, identities, and opportunities in this space (Steele, 1997, 2010). Such representation is paramount to being able to engage authentically and creatively. The promise of informal STEM spaces goes beyond completing tasks; it also includes building community, sharing knowledge, and developing a supportive network. Informal STEM spaces aim to provide a more open environment and a curriculum tailored to the needs of participants (Dou et al., 2019; Habig et al., 2020; Young et al., 2019). Referencing the opening lyrics creates a space that would allow participants to "turn themselves all the way up." Designing an informal space where Black boys are fully appreciated without systemic anti-Blackness in STEM is mandatory.

In navigating the racial and equity complexities of informal STEM settings, recognizing the unique experiences of Black boys is essential. There's an acknowledgment that crafting a secure and welcoming atmosphere is fundamental to cultivating enriching educational experiences and results (Fordham & Ogbu, 1986; Noguera, 2003; Stovall, 2004). Instead of addressing systemic inequalities, the burden is often placed on Black boys to bear the weight of expectations, particularly in STEM fields (Brown, 2011; Brown & Edouard, 2017; Stovall, 2022). However, this “deficit-based” approach (Jackson, 2022; McGee, 2020) fails to consider the toll it takes on well-being. The concept of weathering becomes relevant here, as it shows how the oppressive system can wear down an individual's ability to assimilate and thrive within it, not just physically but also mentally (Geronimus, 2023; McGee, 2020). A deliberate reflection of Black boys' perspectives and diverse identities, ensures they are acknowledged and listened to within these spaces (Berry & Stovall, 2013; Clark et al., 2023; Ladson Billings, 2011).

For this track, we ask a clear and deliberate question: **How do we ensure that Black boys feel empowered to navigate these spaces without the burden of performative assimilation?** The existing discourse prompts a reflection on the often complex negotiation of identity and belongingness, encouraging educators and facilitators to critically examine their practices and create environments that champion authenticity and inclusivity.
This discourse ultimately feeds into the broader conversation about race, identity, and performance in various social contexts. For many Black boys, putting on a show in front of “company” and making sure to behave professionally within the expectations of a structure created by a white paradigm can be challenging. Informal STEM spaces, designed to be more relaxed and welcoming, are often found in afternoon or summer programs that foster a liberal, open, and causal culture (Dou et al., 2019; Rogoff et al., 2016). Despite a relaxed atmosphere, not everyone can afford this casual culture; particularly, Black boys often feel pressured by a rigid learning environment nuanced as professionalism (Cedillo, 2018; Morton et al., 2019). As I continue to use this work as an opportunity to question and challenge existing STEM structures, it becomes imperative to create safe and inclusive informal STEM environments that allow Black boys to thrive. Such environments should foster a sense of belonging and authenticity, while also encouraging them to engage critically and inquire more deeply, rather than resorting to performative assimilation.

For this track, we delve into the conflicts that arise between conforming to established professional norms and remaining authentic to one's identity. Finally, we propose solutions that designers of informal STEM spaces can implement to help Black boys feel more comfortable and authentic.

Research Positionality

In this paper, authored by two Black men in STEM, I, Kareem Edouard, will lead the discussion and articulate the content, drawing from our lived experiences. My colleague and mentor, Taquan S. Stewart, and I offer practical solutions to better support Black boys within the informal STEM community. Taquan, with over 25 years of experience in education, brings a grounded social justice and critical pedagogy framework to operationalize these solutions. We have worked together for 15 years and draw on our collective expertise to present straightforward suggestions.

Black students often face challenges when engaging in authentic experiences, as they are constantly scrutinized for their language and cultural capital. Navigating these challenges is crucial for Black students to apply their expertise effectively.

As I reflect on my personal journey in STEM spaces, I would like to share my research positionality as a Black man with a long history of engaging in these spaces. There are problematic implications that stem from my experiences that I would like to address. As a Black boy, I spent my adolescence looking for places where I could indulge in my passions: rap music, comics, video games, and other activities that allowed me to express myself. Identifying as Haitian American, I often felt like an outsider, navigating the complexities of immigrant parental expectations while seeking a niche in mainstream culture where I could reconcile my feelings of otherness.

There were afterschool initiatives that catered to young boys and men, providing access to early computers and tools, enabling us to evolve our own cartoons, videos, and other tech-based activities. I had hoped to be my true self in these spaces, but I soon realized that my interests would not be enough to lead to my success. What mattered was “fitting in” within the space. I noticed that my presence was scrutinized from the moment I stepped into the room. I felt constantly policed, which led to moments of self-doubt and the realization that there were unwritten rules I needed to follow.

In order to navigate these spaces safely, I had to adjust my behavior. I had to ensure that my physical presence was non-threatening, my voice was moderate, and my choice of words aligned with what was deemed appropriate. Terms that were part of my everyday vernacular, like “axe” instead of “ask” or “mines” instead of “mine,” were constantly corrected in an attempt to make me conform to a more “professional” standard. This paper is grounded by my constant negotiation of identity in informal STEM spaces. This issue is complex as it involves race, identity, and power dynamics, leading to impostor syndrome and deep trauma (McGee, 2021).

The Context of Showing Up

The goal of designing informal learning spaces is to transition education from traditional, didactic classrooms to environments that foster creativity, innovation, and meaningful activity (Lee et al., 2018; Rogoff et al., 2016). Informal STEM spaces break from traditional assessments and standards, allowing for curriculum experimentation and empowering those who are often overlooked to meaningfully contribute (Eshach, 2007; Greenfield, 2009; Strauss, 1984). A key question is how the cultural transmission of space provides genuine access to all members and whether that access truly promotes emotional development and STEM identity formation (Dasen & Akkari, 2008).

The research on culturally sustained learning takes a close look at how resources, identity, and learning environments interact, revealing how these spaces can act as catalysts for empowerment and transformation (Buffington & Day, 2018; Champion et al., 2020; Mistry et al., 2022; Paris & Alim, 2014). My research has focused...
on how informal settings provide Black children with a platform to actively engage with STEM (Edouard, 2023; Edouard & Kim, 2017), positioning them not just as recipients of knowledge, but as key contributors to their own educational journeys.

Critiques have been made regarding the traditional narrative surrounding resource allocation in underserved communities, calling for a comprehensive reevaluation. The consensus emphasizes that the issue extends beyond mere access, advocating for a redefinition of what constitutes supportive learning environments for Black boys. A focus on their unique experiences and the ongoing negotiation of their identities within these spaces is deemed crucial, as is striving to spotlight opportunities for transformative learning and the affirmation of their identities.

In this paper, we situate the two most popular variations of informal STEM environments. The first type is the in-community track, which provides more opportunities for practitioners to connect with communities and support long-term growth. These spaces allow community informal spaces to organize their space and create an open engagement that reflects the values and ethos of the community. The second type of informal space is found in academic institutions. These spaces support the engagement of the campus community by providing a place for students and community members to come together and engage in dialogue. The academic setting is generally supported by research and is designed to generate understanding through curricula, resources, and originally funded resource initiatives. Both private and public institutions are building these spaces for the community to engage in conversations and discussions. There are other categories of informal making spaces, but for the purposes of this track, these two are the most experiential and direct in the underserved community population where Black boys attend academic institutions. I highlight these because a discussion must be had about how these spaces are designed. The successful spaces for Black boys are held after school, during the summer, and accessed by community transportation. All of which make it prime for connection with the community.

We’ve given context to the space in an effort to shape how these spaces are designed, which, as previously mentioned, is the role of leadership. The practitioners in these spaces share the lead for both the overt curriculum and the hidden curriculum (Anyon, 1980; Druery & Brooms, 2019; Graves & Aston, 2018).

The literature examines the role of mentors, educators, and peers in either aiding or hindering the process of identity negotiation, acknowledging the intricate and layered process of identity development (Blumenfeld et al., 1991; Kardash & Edwards, 2012). The interactions and relationships nurtured within informal STEM spaces are crucial, as they profoundly influence Black boys’ self-perceptions, their perceived capabilities, and their position within the wider STEM community (Brown, 2011). There is importance in how the leadership in these contexts approach the sustained vision and representation for all students in the space, but particularly for Black boys, there is a very limited representation, both in leadership and among those who are closely connected to these populations (Edouard & Kim, 2017). The call for diversifying STEM leadership in both formal and informal spaces has been a longstanding one, yet it has encountered significant challenges. The existing research has been clear on the benefits of having leadership that reflects the diversity of the community and represents those who are and have been underserved, facilitating not just identity development but also setting the tone for future learning and engagement among participants (Cheryan et al., 2011; Greene et al., 2019; Noguera, 2003; Villegas & Lucas, 2007; Wright et al., 2016).

There is a critical aspect of leadership that is being explored: the way leadership is setting expectations for participants, which are resulting in some troubling outcomes for Black boys. When looking at leadership, connections are being made to understand how Black boys are engaging with learning, how often they are selected for leadership roles, and the role of projects that are being selected (Gasman et al., 2017). This all has bearing on how things begin with learnership and mentorship initiatives. The call for increasing, in particular, the Black male presence in the making space is one that is deeply rooted in the STEM community (Gasman et al., 2017; Greene et al., 2019), and the ensuing discussion about leadership is one that will allow for the group not only to diversify thought but also to develop how we engage and create new terms. Having more diverse representation makes it clear that not only will there be greater accessibility for participants, but there is also variability in the types of paths and options for engagement; really just showing how thinking and being able to adapt to the diversity of a space is rooted in ideological structures (McGee, 2020; McGee, 2021). The literature calls for a rigorous examination of these learning environments, advocating for their transformation into spaces that are inclusive in both theory and practice (Gutiérrez et al., 2017; Jackson, 2022; McGee, 2020). This necessitates consideration for the cultural, social, and emotional dimensions of Black boys’ experiences, understanding how these aspects are intertwined with their STEM learning journeys.

The literature on this subject underscores the unique experiences of Black boys in informal STEM spaces, advocating for a nuanced understanding of their navigation through STEM fields. The aim is to contribute meaningfully to the discourse on educational equity, offering insights into and recommendations for the development of learning environments that genuinely support and affirm the identity and potential of Black boys in STEM, while also being mindful of the pervasively white-centric nature of these spaces (Pailey, 2020).
The Inner Turmoil of Identity Shifting

Building on the previous section, this section will focus on the internal conflicts and psychological strain that stem from constant identity negotiation. I will discuss the implications of having to constantly "say the right things," "react the right way," and "behave in a manner that draws positive attention," highlighting the inner turmoil created by shifting identities.

In STEM education, there is a set of expectations and a language that contribute to the commodification of a sense of uniformity of participation in a discipline (Brown, 2011; Curry & Hanauer, 2014; Gutiérrez et al., 1999). Engaging in using tools of measurement, and discussing findings in all branches of the discipline enables collective work around a large group of people.—yet there is still an opportunity for new language and expressions for practitioners across all languages and abilities to connect using the same universal set of principles and measures (Reeves & McKenney, 2013; Wonnacott et al., 2008). STEM disciplines value problem-solving skills, but Black students are not respected due to language bias and anti-Black narratives (Champion et al., 2020; Halberstadt et al., 2018; Zellmer & Sherman, 2017).

Imagine showing up to a making space, facing challenges and participating in rich activities that require all your mental faculties to engage. You are gauging new design principles, developing new questions, using new resources and tools, and entering into new spaces. Most of your white counterparts are “allowed” to engage authentically and fully. Black students often face challenges when trying to engage in authentic experiences, as they are constantly scrutinized for the way they talk. This process is closely linked to how they navigate and apply their cultural capital. They are auditing, not only their language but their very being and how they physically engage. For most Black boys, they hold back when they enter these spaces, ensuring that they act professionally, engage professionally, and do not bring any shame or ill regard to their activities because these spaces represent a “special opportunity that should not be wasted” (Burt, 2021). In this conversation about not wasting opportunity, the tensions these Black boys face make it very difficult to be authentic and fully engage in these spaces (Clark et al., 2023). They do not want to overshadow other participants, take up too much space, or create negative impressions that could make it difficult for them to return to the space the next day.

This leads to a conversation about identity shifting, more colloquially known as code-switching (Burt, 2021; McCluney et al., 2019). For many academics, this idea of being able to code-switch within a given context has been represented as a superpower. Code-switching shows this dexterity in communication and being able to shift from one identity to another, which then does two things (Myers, 2020). One, it preserves the long-term discussion about identity, and two, it allows us to think about how this code-switching is a protective opportunity for Black students to be able to enter spaces and continue navigating, engaging, and building STEM practices while protecting their cultural identities and their footprint outside. We argue that code-switching, which is a long-held framework around culturally relevant engagement within learning spaces, is unnecessary and markedly taxing; placing the burden on Black students, versus accepting them for who they are.

The notion that Black students must code-switch to adapt and fit in is problematic; it perpetuates the idea that they need to learn how to "switch" not only their physical presence to conform to a narrative of professionalism (Burt, 2021; Johnson et al., 2022; McCluney et al., 2019; Miller, 2023) but to speak in a way that makes others around them feel comfortable. This expectation places a significant burden on Black students to assimilate and perform in a way that may not align with their own cultural identities or values. First, when thinking about code-switching, there is an assumption that there could always be errors in engagement or what may be correct in the current space. You have only this space, but then there is self-doubt surrounding who you are at the outset and the idea that it is “not good enough” for this space.

Second, the idea of code-switching presents a toxic need to shift identity, limiting the ability to show up as one's authentic self (Jackson, 2021; Young & Barrett, 2018). This underscores narratives about how Black people who code-switch can find themselves in a much safer and more favorable position with their fellow participants and peers (Dickens et al., 2019). From there, they constantly have to toggle back and forth (Miller, 2023). We argue that if you look at STEM spaces, there are groups that don't need to code-switch. For Black students, their race is often brought to the forefront as they enter STEM spaces. They are frequently reminded of their privilege or the lack of Black participation in the field. For the select few who are able to make it into these spaces, there is a perception of a "golden" ticket associated with their success. Once there, they are expected to not only feel grateful for their opportunity but also to adhere to the cultural norms of the space and ensure that others feel comfortable with their presence. This is an unnecessary burden placed on Black students seeking safer access to STEM spaces.

We maintain that allowing Black students to be their authentic selves would be significantly beneficial, enabling them to overlook arbitrary norms and focus on the innovation and disruption central to STEM spaces. However, this opportunity is not equally extended to Black students as it is to their white counterparts. White
students benefit from cultural and normative frameworks embedded within STEM spaces, which allow students to shape not only their environment but also their expectations of the acceptance of their projects and their roles as leaders. These frameworks open doors to opportunities, especially for white students who are not burdened with the need to code-switch.

Do You Young Homie: Practice Based Solutions

Now we're entering into the solutions phase. How do we then take what we've learned and really apply it to creating solutions for Black girls and boys? There are three ways we can think about this. The first is designing and creating environments that cultivate identity and innovation. The second is to encourage authentic engagement with Black boys. The third is through examining the diversity of leadership. In this section, we specifically concentrate on these three areas because we believe they are crucial in shaping the authentic engagement of Black boys in informal STEM spaces. We also aim to consider how these areas not only support individuals within this space but also empower them to become leaders in their practices, collaboratively building and shaping this space. We believe these solutions can be used when creating frameworks to build a community for Black boys to authentically show up, not only through language but also their physical orientation. We should also think about how the leadership within these spaces can reflect the identities of Black boys, which we can also apply when we see the cultivation process of Black girls and help encourage and foster more opportunities for them to authentically show up in these spaces as well. This next section is all about solutions that grapple with and tackle how we can build very concrete and actionable opportunities, particularly for Black boys, to show up and engage.

Cultivate STEM Community-Based Language

There is a direct conversation to be had when considering the cultivation of identity affirmations. It is crucial that Black boys are not forced—or even encouraged—to abandon their identities when entering a learning space (Carey et al., 2022; Clark et al., 2023; Ladson Billings, 2011; Noguera, 2003). In their study on cultural identity development, Helms et al. (2012) emphasized the role of identity in an individual's psychological well-being. Like people from any background, Black boys undergo a process of self-exploration that is shaped by their ethnic encounters. It's essential to recognize that imposing pressure on them to abandon who they are can disrupt this journey and result in an identity crisis (Erikson, 1968); that internal conflict and confusion about one's self-identity, values, and purpose in life. When Black boys are compelled to align with norms that may conflict with their identities, it can reinforce stereotypes, resulting in internalized stigma and a decreased sense of value (Steele, 1997). A mismatch or cultural disconnect between the cultural backgrounds of Black students and the educational system hinders academic success (Delpit, 1995; Ladson-Billings, 2009; Nieto, 1999; Stewart, 2011).

We introduce a concept of STEM Community-Based Language which refers to the linguistic expressions, forms, and styles individuals bring from their home communities into the new STEM environment. A set of expressions and terms that can be newly engaged and adopted into the informal STEM setting, not only by Black boys and all classmates but also by the leadership in the classroom. Considering Brown's work, which places students' discursive identity (Brown, 2004, 2006) at the forefront as a means to examine student discourse, there's a clear understanding that scientific literacy must consider the sociocultural contexts of language use. This is essential to fully comprehend the affiliation and alienation linked with the appropriation of scientific discourse (Brown, 2004, 2006). In practice, STEM Community-Based Language is used to define how students share and communicate in their home communities and how these linguistic skills can be leveraged in new STEM settings. By valuing the linguistic diversity students bring, educators can create more inclusive and effective learning environments. This approach also encourages students to draw on their cultural and linguistic knowledge, enhancing their engagement and deepening their understanding of STEM concepts. It invites a broader range of perspectives and insights into classroom discussions, fostering a richer, more diverse academic discourse.

Operationalizing STEM Community-Based Language

Preserving their cultural identities is crucial for fostering a positive educational experience and ensuring equitable opportunities (Ladson-Billings, 1995). It is important to acknowledge and appreciate the range of languages present within our society. Equally significant is creating an informal learning environment that caters to students from various backgrounds. Within the realm of STEM education, embracing diversity can enhance the learning experience by fostering inclusivity and empowering students to express themselves. As discussed by
Baker-Bell (2019), rather than being viewed as an obstacle, linguistic diversity should be seen as an asset that contributes to flexibility and problem-solving skills. However, it is essential to strike a balance between recognizing diversity and ensuring communication in STEM activities. Informal STEM leadership could encourage this linguistic dexterity by explicitly stating that both linguistic forms are accepted and valued in the informal STEM environment, allowing students to speak freely, and even using the home or community vernacular themselves. Terms such as "brick" and "grind" originated from Black cultural expressions and have become part of mainstream vernacular through social media and cross-cultural engagement. "Brick" refers to extreme coldness, and "grind" denotes the effort required to complete a task. These words have different meanings across contexts but enable concise expression and direct communication of specific ideas. If a student uses these terms in informal STEM spaces to express a connection between a scientific or engineering principle, we should consider how they can be accepted, utilized, and serve as a bridge between classroom discussions and the community outside the classroom.

This acceptance is part of building a STEM community language, where all members of the space are not just hearing and using a collective exchange of ideas, but also as a way to foster connection. So, if "brick" is used to express the understanding of extreme temperatures in a project-based STEM activity related to changing weather patterns, the members of that community should work together to accept and embrace this term. It clearly links to a STEM activity and is part of how a member of the community chooses to express and share their knowledge of the subject.

Implementing these approaches in an informal STEM environment fosters an atmosphere that allows students to relate to the subject matter while honoring their linguistic backgrounds. At the same time, it equips them with the skills necessary to articulate themselves in STEM settings where they progressively incorporate and utilize scientific and engineering vocabulary. This approach acknowledges the importance of maintaining communication in STEM domain language while also valuing the diversity among students.

This leads to a broader conversation about knowledge transfer and how to bridge STEM community-based language engagement through the application of language within the space. Another critical factor is encouraging other community members to authentically engage with how language is framed within the learning space. Furthermore, when it comes to authentic identity, it's important to incorporate cultural practices, doings, and community engagement. If there's an opportunity to engage with Black boys and how they relate popular cultural references to STEM, this is incredibly important. It's also crucial to consider how they perceive the concepts of their environment, whether it's the physical design or how they navigate their environmental spaces. These considerations should be integrated into the design of project-based activities and engagement with Black boys.

This is not to suggest that special considerations are necessary whenever a single Black boy is present within a STEM space. However, as we consider informal STEM spaces as vast opportunities for new forms of engagement, it's important to acknowledge that, particularly for those who are heavily marginalized like Black boys are, there should be consideration for their ability to speak, move, and engage authentically, which is essential for them to fully participate in the cultural identity affirmation process.

**Encourage Authentic Engagement**

Considering authentic engagement is crucial (Fantuzzo et al., 2012; Kane, 2016). When Black boys enter STEM spaces, they encounter the expectation that their intrigue is rooted in an inquiry framework, where they desire to explore and understand the world. However, it’s challenging for Black boys to reach this level of engagement, as they are often scrutinized for their self-presentation and interactions (Brown et al., 2017; Zeidler, 2014). To foster an environment where they do not feel marginalized, it's paramount to encourage authentic engagement. Establishing clear norms that allow all participants to openly voice and share their perspectives is a first step. This approach enables marginalized participants to express disagreement or feelings of exclusion, which is vital for their willingness and ability to engage openly and authentically (Rhodes et al., 2011).

Curriculum design is another critical aspect. Projects steeped in monocultural perspectives often fail to resonate with community-based activities or allow Black boys to contribute meaningfully to STEM discussions (Price, 2023). These projects should be designed with openness and diversity, enabling Black boys to integrate their lived experiences and expertise. Many STEM activities, such as robotics or hacking, are culturally normalized (Barton et al., 2018; Bevan, Barton, & Garibay, 2018) and resource-intensive, which can be a barrier. Shifting to incorporate community-based solutions allows Black boys to bring relevant design questions from their communities (Gallay et al., 2021), positioning them as experts in these spaces.

Authentic engagement also means providing opportunities for Black boys to voice their thoughts and create a connection between the content they learn and their personal experiences. This is achieved through thoughtful project design that enables Black boys to participate authentically. It's important to clarify that the goal is not
favoritism or a specific cultural design for Black boys, but rather to create diverse environments that nurture authentic engagement for all participants.

**Diversify Leadership Representation**

Diverse leadership and representation are pivotal in advancing opportunities for Black boys to comfortably engage and build within spaces without feeling obstructed or hindered in their progression. Recognizing the diverse experiences of Black boys is essential. Seeing someone in a leadership role in these spaces who actively participates and engages significantly influences how Black boys envision their futures—futures where they feel genuinely represented, empowered, and capable of shaping their environment. The current participation of Black males in these spaces is insufficient, reflecting broader societal disparities (Bevan, Barton, & Garibay, 2018). A focused dialogue on diversifying the pipeline of Black men with a variety of STEM skills is necessary to create more inclusive opportunities.

Representation profoundly matters, as it influences interactivity and the ability to contribute meaningfully to leadership roles. This is not just about giving back and inspiring others but also about the potential to incite change (Fenwick, 2022). While Black boys can find opportunities to engage and build in spaces where other underrepresented groups, including women, lead and shape discussions on representation, there's a unique and powerful resonance drawn from Black feminist studies on the impact of connectedness and representation (Collins, 1991; Foster, 1993). Leadership that shares common backgrounds and integrates their experiences into the curriculum fosters a sense of belonging and cultural significance. “Black teachers [impart] more than mere school knowledge. They provided discipline, and guided the young black children entrusted to their care” (Foster, p. 108).

Leadership also offers participants, especially Black boys, the vision that they too can achieve similar status. It's crucial for them to see individuals who resemble them, come from similar communities, and have navigated comparable paths to success (Hines and Hines, 2011; Milner, 2006). This visibility in leadership roles provides relatable models of success and discourse within these spaces.

Finally, when developing leadership within these spaces, it's important to remember that such roles can provide tailored and specific guidance when these leaders can draw on their experiences with the inadequacies they themselves faced. Many Black male leaders recount their struggles within STEM spaces and the challenges they overcame. Their presence and guidance in leadership roles are not only vital for shaping engagement but also necessary for encouraging Black boys to maintain long-term involvement in these spaces.

**Conclusion**

Nurturing a sense of identity affirmation in informal STEM education for Black boys demands a deliberate and thoughtful strategy. It's essential to provide these boys with opportunities for self-exploration in their experiences, without the pressure of external influences to conform. Giving in to such pressures can lead to stigma, diminished self-worth, and perpetuating stereotypes. Maintaining cultural identities is key to creating a supportive educational environment and ensuring equal opportunities. Embracing diversity in informal STEM education, including the use of American English, enriches the learning experience. Allowing students to naturally incorporate their language practices, like code-switching, is crucial for fostering inclusivity and empowerment. Balancing this with an understanding of communication standards is important. Investigating the intersection of language, identity, and informal STEM education opens up deeper research possibilities. Linking community-based language engagement to its use in informal STEM spaces and understanding how Black boys perceive their surroundings are important aspects of identity affirmation. Considering these factors is vital for creating environments where Black boys not only feel included but are also confident in expressing their true selves. This is crucial for their involvement in embracing their identities within the realm of informal STEM education.

Creating an inclusive atmosphere for Black boys in informal STEM means prioritizing genuine engagement. They face challenges in meeting the expectation of approaching informal STEM with an inquiry-based mindset while contending with scrutiny over their self-presentation. To combat marginalization, it's vital to establish communication norms that support open expression. Curriculum design is also key; projects rooted in a single cultural perspective limit meaningful contributions. Shifting toward community-based activities and valuing diverse viewpoints enables Black boys to incorporate their real-life experiences and knowledge, breaking down barriers set by culturally normative informal STEM activities. Genuine engagement means linking learned content with personal experiences through thoughtful project design, aiming for diverse environments that encourage authentic participation for all.

To promote equity in informal STEM education and careers for Black males, we must address existing gaps. This includes enhancing access to high-quality informal STEM resources from an early age, with a focus on
funding and supporting programs in schools serving predominantly Black communities. Beyond the classroom, we are committed to empowering Black boys in informal STEM through scholarships, mentorships, and internships, with support from major tech companies and organizations. Showcasing Black role models and success stories in informal STEM fields serves as inspiration for young Black males. It's equally important to foster an inclusive culture within informal STEM education by addressing microaggressions and creating a welcoming environment. Collaborating with colleges and universities, including HBCUs and PWIs, is crucial for recruiting and empowering Black students in informal STEM spaces, ensuring they have fair opportunities for success.

The informal STEM space is where many Black students, particularly Black boys, can engage in meaningful project-based activities, but it's also a bridge they can use to transition into careers and other opportunities. However, the most important aspect of informal STEM spaces is collaboration and building community with their peers, through STEM camps, workshops, and showcases where they choose to be in the environment and have the opportunity to share it. It is here that we see that for many Black boys, they are able to engage, whether it's picking the music in the space or choosing activities and STEM competitions to enter. The limitless space of the informal STEM environment has the potential to foster high levels of innovation, allowing the development of an authentic self, particularly for Black boys. To make informal STEM fields more representative requires a sustained, multifaceted effort. This important work can unlock the full potential of Black men in technical fields, benefiting society as a whole.

**Disclosure Statement**

No potential conflict of interest was reported by the author(s).

**Notes on Contributors**

*Kareem Edouard* is an Assistant Professor of Learning Technologies at the School of Education at Drexel University. Dr. Edouard's research focuses on the intersection of race, culture, and STEAM engagement among students of color. Dr. Edouard is also an early childhood STEM media expert who creates culturally inclusive content and learning strategies. He is a creative producer for Work It Out Wombats, helping to shape discussions around STEM identity, computational thinking, and inclusivity. Dr. Edouard is dedicated to fostering diversity and inclusion, assisting platforms such as YouTube, GBH Kids, and Sensical to make their services accessible and diverse for young viewers. He is dedicated to diversifying children's STEM media and amplifying the voices of Black children. Through his research and creative work, he aims to foster a more inclusive and representative world for children. Dr. Edouard is a former high school teacher who earned a Bachelor's degree in Media Education from DePaul University, a Master's degree in Teaching from the University of Southern California, and a Ph.D. in the Learning Sciences and Technology Design program at the Graduate School of Education from Stanford University.

*Taquan S. Stewart,* Ed.D. is an educator with over 30 years of experience, focusing on science education and leadership. After earning a Physics degree from the University of Delaware and working with the U.S. Army, he taught secondary school science in Delaware and Los Angeles. He furthered his education with a Master's in Education and Administrative Policy Studies and a Doctorate in Educational Leadership. Dr. Stewart was a secondary principal in South Los Angeles from 2007 to 2015 and later directed a charter management organization. He is the SoCal Regional Managing Clinical Director at the Alder Graduate School of Education and serves as Faculty Advisor for the CalStateTEACH and LAUTR programs. He also coaches educators, directs Project Youth California, and mentors urban youth. Dr. Stewart is a published author focused on culturally sustaining pedagogy, the opportunity gap in science, and the preschool-to-prison pipeline. His book, "Thoughts of a Ghetto Scatterbrain: The EP," uses science fiction and critical race theory to inspire educators. As a poet and teacher educator, Dr. Stewart champions a humanizing pedagogy to make education equitable and inspiring.

**References**


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