Operating Beyond Myths: Designing a STEM School For African-American Boys in A Myth Filled Teaching World

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Abstract

As schools are designed to meet the STEM learning needs of minorities, they must rely on a sound theory to practice relationships in their design and implementation. This study documents one school’s attempt to design a STEM school based on their understanding of best practices. Through a mixed methods study of pre and post year interviews and surveys of the we documenting how their views on designing STEM schools for African-American boys changed throughout the year. We discovered 3 myths about teaching African-American boys that changed: (1) A Myth that teachers off the same race will improve performance. (2) A Myth that professional development about curriculum is sufficient for teaching black boys, and (3) A Myth that parent involvement is critical to school success. The results document how a limited research to practice understanding hindered the school’s ability to teach African-American boys.

Keywords: African-Americans, STEM Education, African-American Males, STEM charter school
The movement to enhance STEM education for underrepresented groups has its roots in an assumed relationship between STEM innovation and economic vitality. Although we did not have international assessments to gauge our STEM prowess in the 70s and 80s, many attribute our ability to sustain international prominence to our ability to produce advancements in STEM. Thus, our modern economic prosperity is assumed to be contingent on our capacity to train the next generation of scientists.

Who will fill this need? Results on international tests, namely the TIMMS (Third International Mathematics and Science Study), highlight our need to improve. In 2011, the average 4th grade score of 544 was higher than the international average (500) for students of the same age (TIMMS, 2011). Of the top performances in STEM, the United States placed 6th at the 4th grade level. Where we find the greatest differences between the US and other top-ranked students is in our performance of 4th grade students at the highest international benchmark. Essentially, the US students are performing adequately by grade 4, but are not excelling at the highest benchmark by the 8.

Where the performance becomes more disappointing is when we compare our accomplishments across the context of race. Figure 1, shows how in the 2011 there were differential performances in science education as early as 4th grade. On average, Asian students mean score of 570 was significantly higher than the mean score for White students (568). Multiracial students (559), Hispanic students (517), and Black students (490) all scored significantly\(^1\) lower than White and Asian students. Although the Hispanic students are above the

\(^1\) \(p<0.05\)
international mean of 500, African-Americans were the only group to score below the international mean by the 4th grade.

When the students are compared by grade 8, the differences are magnified. Although every group’s mean score is lower than their 4th grade score, differences between racial groups grew. In the 4th Grade, the difference between Asians and African Americans was -80 points, by the 8th grade that difference increased to -86 points. When compared to their white counterpoint, the same patterned emerged. In the grade 4 scores the difference between African-Americans and whites was -78 points, but by grade 8 that difference grew to -83. A similar pattern emerged for Hispanics, where initial differences between Asians grew from -53 to – 63 and for Whites it grew from -51 to -60. Ultimately, both groups are falling behind Whites, Asians, and their international peers between grades 4 and 8.

With nearly 45,000,000 African-Americans and an estimated 33,7000,000 Hispanic Americans our fastest growing populations are essentially being left out of the STEM pipeline by

![Figure 1. US TIMMS Scores by race grade 4 & 8](image-url)
the 4th grade. With the majority of both racial groups being school aged, our inability to teach STEM to this growing population of 39,350,000 million citizens constitutes a tangible crisis. The need to improve science education relies on schools improving our ability to teach STEM to underserved students (Moses, Kamii, Swap, & Howard, 1989). Many see such a task as a fundamental civil right (Atwater, 2000; Moses et al., 1989; Rodriguez, 2001; Suriel & Atwater, 2012; Tate, 2001).

Reflecting on this data presents an intriguing challenge. In an economy increasingly reliant on STEM field, reports like these call for deeper understandings about how to avoid these achievement differences. Where these reports are limited in their inability to offer insight into the sources of these challenges. Research reports documenting the underachievement of African-Americans and Hispanic Americans in STEM are plentiful, but potential solutions are few are far between. Why are African-Americans and Latino-Americans fairing poorly in STEM education? More specifically, what can schools do to improve access to STEM education for these students?

This research explored an urban STEM school’s attempt to build a model school to break this cycle of STEM exclusion for African-American boys. With a school specifically designed to serve African-American boys, we were curious about what design plans responded to the needs of this demographic and how the school’s leadership planned to implement their plan.

**Theory**

In our effort to understand how race and culture informed the design of the study, we
adopted a critical race theory (CRT) lens (Parker & Villalpando, 2007). This lens was appropriate for this particular study as the school’s leadership designed the school based on a critical race framework. In general, a Critical Race Theory perspective is one where scholars understand how race is a central feature in the reasoning, social design, and interactions of a community (Bell, 1995; Crenshaw, 1995; Ladson-Billings & Tate IV, 1995). A subtext that serves as a foundation to this perspective is the assumption that a color-blind ideology towards the design of schools undermines school success (Hosford, 2010; Parker & Villapando, 2007). Many African-American students must achieve success in community contexts that do not promote their achievement. As a result these students deserve schools that operate with an entrenched understanding of how race and culture mediates students’ lives.

Parker & Villapando (2007) proposed a CRT approach to framing educational leadership. This study applies the Parker & Villapando (2007) perspective on school leadership as it examines school leadership from five critical lenses. Figure 2, provides a representation of the five tenants of Parker & Villapando’s (2007) critical race theory.

Originally used in the context of legislation (Bell, 1987), critical race theory is used to explain how race, and the social interactions associated with race shape access to quality education (Ladson-Billings; 1998; Parker & Villalpando, 2007; Solórzano & Yossi, 2002). Leading scholars of CRT including Tate (2001), Solorzano & Yosso, (2002); & Ladson-Billings (1998) all provide rich understandings of how critical race theory can offer a nuanced understanding on the impact of race in education. Parker & Villalpando (2007) define it by its five critical features: (1) The centrality of race and racism; (2) The challenge to dominant ideology; (3) A commitment to social justice and praxis; (4) A centrality of experiential knowledge; and (5) A Historical Context and Interdisciplinary Perspective (see figure 2). Collectively, these tenants provide the basis upon which critical race theory
is applied to designing schools to meet the need of African-American boys.

**An Application to School Design**

When considering principle one, *the centrality of race* several issues emerge. First a CRT perspective would mandate an exploration of the relationship between race, racism, and the science community. For many students the identities necessary for school success, are accompanied by the stress of associating with the cultural consequences of black life (Purdie-Vaughns, Steele, Davies, Ditlmann, & Crosby, 2008). By examining a school designed in recognition of CRT, this study explored how the school planning applies this first principle of CRT theory to recognizing students’ needs and addressing them through design. As the school attempted to build a community where racial identities and school identities experienced synergy they attempted to create learning environments where the relationship between race and education were explicitly discussed. The second principle *recognizes and challenges dominant ideology*. In applying such a principle to school design, one must explore how school leadership implements a curricular structure that allows for the critical social critique of dominant ideologies in science. As teachers are trained to teach students of color their curriculum and instructional practice reflect a social critique of the dominant ideologies of race.

The third principle, *a commitment to social justice and praxis*, can be used as a lens to interpret how the school leadership applies this principle to the school curriculum and design. As students are taught and the school is designed in community engagement issues of race and culture become practical aspects of the activity of a school’s interaction with the community. The fourth principle, *a centrality of experiential knowledge*, offers a critical lens to examine how the school leadership attempts to centralize student experience in applying contemporary science issues to the local challenges (for example issues of local diabetes, asthma). Finally, the fifth principle, *A Historical*
Context and Interdisciplinary Perspective can be used as an interpretive lens to understand how leadership attempts to connect contemporary school design to the historical context between science and the African-American community.

**The centrality of race**

A CRT perspective assumes that race and racism are central subtexts of American society. The argument is that policy, discourses, and educational norms are all impacted by race in unique ways. Race is also a central framework that guides the normative values of a community. These normative values may include sub dimensions of identity that include what types of examples are used, what ways of talking are valued in the community, and what types of identities are salient in a given community. In the context of school design, a CRT lens would require the school leadership to build an environment where the new dominant discourses are of two sorts. First, this new environment must be one where African-American identities can be central to cultural participation in science. Second, such an environment must include an opportunity for students to critique how their identities as African-Americans matter. Hosford (2010) describes CRT leadership by stating that, “The history of African-American schooling and education reflects a strong emphasis on interpersonal and institutional relationships among Black schools, families, educators, and communities (Hosford, 2010, p.60).” In adhering to Hosford’s position, this study seeks to explore how the school leadership understands issues of race, school, family, education, and community in the design and execution of their school. More specifically, we sought to understand what the school leaders learned about school design through their first year of operation.

**Research Questions**

To explore what the school’s leadership learned about school design for black boys, we
explored the following research questions:

(1) What did the school’s leadership learn about designing a STEM school for African-American boys?
(2) What areas of change emerged as most significant over the course of the first year of the school’s operation?

The section that follows provides a description of how these questions were examined.

**Methods**

To gain an understanding of how urban educators learned from their design of STEM elementary school for African-American boys, we conducted a yearlong study. We used a one-shot case study design that follows the school leadership’s learning curve. This pre-experimental approach allowed us to identify which variables in the school’s design were potentially malleable and had an impact on the school’s outcome in years to come (Stanley & Campbell, 1964). Figure 3 provides a schematic representation of this design (Stanley & Campbell, 1964).

**Figure 3. Representation of the study design.**

**Sample**

At the outset of the study, we identified a group of individuals responsible for the school’s execution at its founding. In this paper, this group is referred to as the leadership team. That group included: (1) School Board Members, (2) Teachers, and (3) Staff members. The school was
started by a small subgroup of the Benjamin Banneker group\textsuperscript{2}. The group is an organization of African-American male professionals who focused on mentoring African-American boys through after-school mentoring programs. In response to their growing frustration with the underperformance of African-American boys in public schools, this group founded the school in September 2013. The school was in its first year of operation during the time of the study. The population of the school was 100\% African-American males. The school opened its doors with Kindergarten, First Grade, Second Grade, and Sixth Grades. Each class started with 20 students with two 4\textsuperscript{th} grade classes. The initial students population was approximately 100 students.

The school was located in a northern California city challenged by crime and low school achievement. The City Data\textsuperscript{TM} index reported the city’s overall crime statistic to be 1018.7, which is three times higher than the national average of 301.1\textsuperscript{3}. In particular the 2012 murder total of 127 is well above the national average of 31.8. The numbers of African-American men in the city were reported to be comparable to the numbers of African-American men incarcerated each year. Figure 4. provides a representation of those disturbing rates. In 2002 it

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure4.png}
\caption{Representation of City X’s Crime and Educational Disparities}
\end{figure}

\textsuperscript{2} This is a pseudonym of the organization to maintain the anonymity of the organization.

\textsuperscript{3} \url{http://www.city-data.com/crime/crime-Oakland-California.html}
was reported that a mere 37 African-American males were documented as eligible for the UC system, while 82 were victims of homicide. Even as recent as 2012 there were 100 college ready African-American men compared to 82 killed by homicide (Tucker, 2013). This crisis lead to the establishment of the city’s African-American male initiative dedicated to improving the education of African-American boys throughout the school district. The establishment of the Benjamin Banneker School was a response to addressing this reality.

**The Team**

The board was comprised of 7 professionals who established the vision for the school. 3 of the board members were former educators (2 principals, 1 teacher). The other board members were professionals from a diversity of professional endeavors. The board hired the staff and principal, established the school’s charter with the district, and assessed the direction and effectiveness of the school. The principal was an African-American male with # years of experience leading urban schools. The teachers consisted of 3 first year teachers from Teach For America and two veteran teachers who had more than 15 years of experience. There were 3 African-American male teachers, 1 white male teacher, and 1 African-American female teacher. Finally, the support staff included 1 special needs supplemental counselor and 2 administrative assistants. Each of these three team members were African-American women.

We conducted a total of 15 pre interviews and 11 post interviews of the school leadership team. Among the pre-interviews, we interviewed 7 Board members, 5 teachers, and 3 staff members. The post interviews included 5 Board members, 4 teachers and 2 staff members.

We used a triangulated set of resources (interviews, content analysis, and survey) to understand what they learned about effective charter school design (see figure 4). This project reports on the results of the combined interview and survey analysis.
Instrument Development and Data Collection

We designed two types of research instruments. First, we created an interview protocol that explored how the leadership viewed the school’s needs. We also designed a short pre-year/post-year survey to assess how their perceptions of the school’s design changed over the course of the year. To provide us the capacity to triangulate the data, we used the tentative quantitative survey results to guide our subsequent analysis of the pre-post qualitative interviews. Said differently, we identified patterns of change in the survey responses as a data reduction strategy to examine patterns of change in the interview response.

Interviews

The interview protocol itself was designed to capture a number of key ideas. We based the protocol around a number of critical sub-constructs that included demographic information, questions about the needs of African-American boys, questions about STEM preparation, parent involvement, community involvement, curricular choices, and physical spaces. Overall, both the pre and post interviews provided the participants an opportunity to discuss their reflections on how the school was designed to meet the needs of African-American boys.

In these interviews, we asked questions about the needs of black boys, school design, and philosophies that guided the school’s approach. The interview included questions like “What types of instructional practices at this school were designed specifically for black boys?” At the end of the academic year we asked the same question to assess how the participants either remained consistent or changed their perspectives at the end of the year. In a similar fashion, some questions changed slightly over the year. For example we asked, “What will the school do to promote community involvement?” prior to the year. After the year, that question became “What did the school do to promote parent involvement? Did it change? If so, how and why?”
Adding an extension of that nature allowed us to alter the protocol so it captured the nature of change that occurred over the course of an academic year.

**Survey**

To supplement the interview we administered pre-and post surveys. The surveys were designed using the same constructs that provided the basis of the interview protocol design. Initially the research team met to explore constructs that informed the study. The constructs included (a) assumptions about African-American boys, (b) thoughts about school design, and (c) plans for implementation. We then constructed subscales that included a number of ideas ranging from the physical design of the school to issues associated with how race impacts students’ learning. All items were measured using a 4-point agree-disagree Likert scale.

In proceeding we designed questions that offered us an opportunity to access the thoughts of the leadership on these issues. Team members wrote questions, met to review them for construct validity and edited them accordingly. After several iterations of designing questions, the survey was sent to the leadership team via e-mail. This process was replicated during the beginning of the year (pre-survey) and after the completion of the academic year (post-survey).

To assess the reliability of the survey, we conducted a Cronbach’s alpha analysis on each of the constructs of the survey (see appendix). As noted in table 2 in appendix, the reliability of the survey varied across the different constructs. With the highest reliability being found in questions associated with parent involvement and the lowest reliability being found in questions of race. This variance may be the product of the small sample size for this study with 15 pre survey results and 12 post survey submissions. Additionally, the use of so many constructs in a small survey may have produced additional variation. Ultimately, the overall Cronbach’s alpha of .63 limited our confidence in the survey instrument. As a result, our analysis was only conducted
on the construct items with a Cronbach’s alpha scores of .75 and above. However, our goal for the survey was to serve as a data reduction strategy that would point us towards areas of the interview data that could potentially show changes in perspective. Ultimately, the results of the survey component of our study provided us with a foundation upon which to conduct the microanalysis found in both the interview analysis.

**Findings**

The findings of this study provide a unique view of designing schools with a specific critical race theory design. As the school’s leadership attempted to build vision for the school, the necessities of teacher training, the realities of preparing African-American boys for STEM and the task of building a supportive parent community all emerged as complex challenges in the school. The data analysis that follows outlines the Banneker school’s growing understanding of how the centrality of race, teacher training, and parent involvement intersect in the building of a successful urban school. The data is presented in an integrative fashion, where the quantitative data is presented first and explained by the results of the compatible qualitative analysis.

**Teacher Professional Development**

![Figure 5. Changing perceptions of professional development.](image)
A key focus of the school’s CRT approach to school design involved offering racially and culturally informed teacher training and professional development. The school leadership’s views of the necessity of professional development changed over the course of the study. As we asked the teachers, administrators, and board members what was important for teacher to effectively teach black boys, we encountered changing perspectives over time. Although the mission states a commitment to teaching in culturally relevant ways as important for student success, the implementation did not align well with this vision.

The Need For Professional Development

As a school designed to teach African-American boys, one of the priorities of the design involved creating environments where the teachers were trained to effectively teach African-American boys. When asked whether the professional development plan was well positioned to prepare teachers to teach African-American boys the team grew increasingly cynical about their training. As documented in Figure 5, the pre-test scores of 3.8 (overall), 3.5 (teachers), and 3.88 (board members) reflected a rather optimistic view of the appropriateness of the professional development. However, as indicated below, all groups grew less convinced of the viability and the appropriateness of the professional development over time. From the beginning to the end of the year, there was a significant change in school staff, faculty, and Board members’ (in aggregate) beliefs about PD related to African-American males. From the beginning to the end of the year all subgroups were less likely to agree that the professional development was focused on developing the staff’s abilities to teach African-American Males (p=0.008). What was even more disconcerting was the growing distance between the board and teachers' pre and post year conception of the appropriateness of professional development and its value in preparing
teacher to teach African-American boys. It appears that the board and teachers perspectives on professional development were became more divergent.

So what changed in the school’s perception of how it should train teachers about teaching African-American males in science? Although the mission states a commitment to teaching in culturally relevant ways as important for student success, the reported implementation of teacher training did not align with this vision. In the interviews, the board members were more likely to talk about the availability of culturally relevant pedagogy (CRP) professional development, where the staff was less likely to say that they were being provided CRP professional development. Instead the teaching staff was more likely to talk about professional development around curriculum. They seemed to prioritize curriculum professional development over culturally relevant pedagogy, while the school’s board viewed this from the alternative perspective.

Mr. Barham explained how they designed the professional development saying:

We set up PD so that they – so that our instructors can be not only educated to the needs of African-American children, but also sensitive to the needs of African-American children, and so learning whether the potential shortfalls that they may encounter with educating children of African decent, because they, in America in America – let me clarify that, because children born and raised in America take upon a different upbringing sometimes (Barham, pre).

As a board member, Mr. Barham’s perspective that the school was to be designed to model ideal teaching practices for African-American boys reflected the board’s overall goals and a sea of good intentions. In the pre-interview Edward, a novice teacher, agreed with this assumption as he shared, “So we spent a lot of time going over different methods to, different methods that would cater towards the population that we're getting, which is Black males.” Before the year, it appeared that both leadership and teacher were closer in their understanding of how their training was guiding them towards teaching STEM to African-American males.
After the year, the interview data began to paint a different picture. Collectively, both groups expressed a feeling that the professional development did not prepare the teachers to teach African-American boys, but their focus began to differentiate. We discovered that the board and principal discussed how the training was about culture while teachers and grew frustrated and explained that the training focused exclusively on using curriculum.

After the year Edward explained, “There wasn’t PDs designed to say this is how we deal with African-American males.” Xander, offered a similar response saying, “So, again, we didn’t have specific things on [black boys] you know, just for black males.” Pearson further affirmed this perception and explained, “Our professional development, first of all, was [about] our curriculum.” Ms. Norris also avowed this perception by explaining:

Well, I think with our trainings we were able to understand how [our curriculum] works and there’s a plethora of information in their curriculum and so we have to be able – we have to discern which to choose from, what to pick out.

The growing divide in need for preparation was perhaps greatest in the principal’s explanation. Principal Jahir explained in the post-interview, “I think the teachers, more than anything, just need to have access to professional development that will help them fully understand how to engage kids at the kinda level that Common Core is reflecting, which is essentially wanting them to have students be able to show what they’re doing and explain and analyze as, you know, just beyond just kind of rote memorization, daily practice, read this and answer this question.” His lens which moved from a focus on culturally relevant pedagogy prior to the academic year towards a focus on teaching the skills of the common core is a sharp reflection of school’s challenge to define the training needs that were most essential and to offer.

The school signed a contract to receive free curriculum from a curriculum provider. As a result, their training focus shifted from a focus on making their school one where culturally
relevant pedagogy was a primary feature in STEM to a focus on helping the teachers understand how to use the curriculum material in line with the values of the common core. Ultimately, there is no wrong answer, but a school with dueling institutional priorities runs the risk of being ineffective if the teachers want to be trained to work well with their demographic of students and the leadership want them to work well with the curriculum. What was lost, in this professional development transition was a focus on the centrality of race, and a use of social justice instruction as a means to help students see vital connections between science and their social, physical, and political lives.

**Learning About The Black STEM Teacher**

A second area of focus involved the recruitment of African-American teachers. Over the course of the year we noticed a shift in the school’s leadership reliance on the assumption that black teachers were best suited to teach STEM to black boys. This assumption is rooted in the idea that black boys will need black men as role models and stands as a central component of the organization what founded the school. In our quantitative analysis we found an interesting learning curve around assumptions about the race of the teacher. Overall, the collective mean change of 2.44 to 3.5 on a question, which asked, “When teaching STEM, the race of the students is not important to the success of black boys?” With a p value of

![Figure 6. Changing Perceptions The Need for Black Teachers](image)
p = 0.022 we noticed a shift in the teams adherence to the belief that the race of the teacher mattered. This question was reverse worded to reduce selection bias. Figure 6 above, provides a representation of the team’s perception on the need to have black teachers. As indicated in the figure, all groups were less convinced of the need to have an exclusively African-American teaching force after the years being more positive (teachers = 3.0; board 2.22) assumption. After the year, the teachers’ (1.7) score and the board’s score (2.0) both reflected some significant changes in perspective. As an entire team, the shift from a mean score of 2.56 prior to the year 1.5 was statistically significant (p = 0.022).

In supporting these findings, we focused our qualitative analysis on how the school’s leadership moved from a strict reliance on same race instruction toward a focus on pedagogy. At the start of the year, most of the school’s leadership placed a great deal of emphasis on having highly skilled teachers who shared the race of the students. Some were well aware of the debate about whether or not the race of the teaching staff was a critical component of the school’s design. Mr. Trestin, a board member, explained,

There’s the other argument that black boys need black men and black women in front of them in order for them to be successful, but that’s not the case if those men and women have low expectations, or will accept mediocrity of themselves and of students (Mr. Trestin, pre).

His perspective was one of the more nuanced perspectives on the role of race as it focused on assuring expectations were high. Another board member, and former principal Mr. Barham offered a similar lens in the post interview by saying, “If you can effectively teach my children what it is that they need to learn, and you’re very proficient in your field, or you can relate to students, you have a background that can ‘quote-unquote’ relate to the overall mission and purpose of the school, then I don’t care what you look like.” These perspectives were unique
representations of the pre-year lenses, as they would not commit to simply valuing the race of the teacher over other critical pedagogical skills.

Others in the leadership team were far more dedicated to focusing on employing a team of African-American STEM teachers. Mr. Raheim, the most experienced teacher at the school was adamant about the need to employ black teachers. He explained:

If we were only in a society that was only black, I would say that my preference would be that we have highly qualified black teachers, but to have highly qualified teachers that come from all stripes, with the majority, in my opinion, should be black, because we need those sorts of role models in front of the students, and I think the balance in gender is just as important “ Mr. Raheim.

His suggestion that the school should value black teachers was a foundational feature of the school. Dr. Al-Hassan discovered that parents valued having black teachers at the beginning of the year. He explained, “Right now, we have some parents that are at a point where they've had such bad experiences with white teachers in public schools that they say that they believe a black male is the only person who could really help their child” (Dr. Al-Hassan, Pre). He would later go on to explain that, some of the parents were disappointed when their teacher was announced that it was going to be a white male” (Dr. Al-Hassan, pre). Ultimately, the shared assumption was that African-American teachers had something unique to offer African-American students. Mrs. Norris affirmed this perception when she explained, “I think in having African-American teachers is a – can be seen as role models for the students, especially if they haven't had that in the past” (Norris, pre). Finally, Mr. Washington, a board member offered a fitting representation of this perspective as he explained:

So [the school] just lends itself to young people who have been able to have someone in front of them that look like them and who give them the nurturing and the push and prod to be successful...So again, these students need to see men that look like them teaching.” (Mr. Washington, Pre)
Overall, the school’s original design reflected a critical assumption about the necessity to find teachers who could perform two critical tasks. On the one hand, the school wanted their teachers to be role models. On the other hand, the school had an expectation for the teachers to maintain high expectations and strong pedagogy. From these early reflections, these complementary goals seemed to be held in equal esteem. What emerged as interesting was a shift from a focus on race to a focus on pedagogy.

**From Race to Pedagogy: A Shift in Values**

When we interviewed the school’s leadership after the year, we encounter an intriguing shift in the way they talked about the value of having a staff of African-American teachers. Dr. Al-Hassan seemed less committed to his original plan. He explained, “I think that you could have a good teacher who’s committed to the children involved in their education and as long as there are black males around them to help mold them and help mentor them (Dr. Al-Hassan, Post).” Mr. Sanders, the school’s only white teacher, supported his perspective. He explained how he did not think that race hindered his teaching. He explained, “Because I feel like I’ve reached all of my students on a personal level and I don’t think my race has gotten in the way at all (Mr. Sanders, Post).” Principal Jahir shared this opinion, when asked how the race of the teacher mattered he simply explained, “I did not see any disparities around one’s race within the context of teaching (Principal Jahir).” In reviewing the collective responses, we noticed a pattern of explanations where the board and teachers explained how important pedagogy was and how it secondary o issues of race.

Just months after designing and implementing the school, board member and founder Dr. Al-Hassan showed an extreme shift in his valuing of race. We suspect the success of the one white teacher on campus influenced his thinking as well as the thinking of the rest of the team. In
one of the more striking reflections on issue of race and culture, Dr. Al-Hassan explained that one of the errors of the school involved operating on myths about the centrality of race in his urban STEM school. When asked how the race of the teacher mattered, he offered this insightful reflection:

So, there were a lot of myths that we were guiding us. [The idea] that we need to have all males teachers in the school and that’s absolutely not the case. And we don’t necessarily have to have all black males or black faculty in the school. As long as they love the kids and are not afraid of the kids, and can get eye level with them and devote some serious time to them, that’s all that really matters.

His suggestion that the school was operating on some “myths” is a powerful confession and highlights their growth curve in understanding how race and culture mattered in the provision of a high quality education to African-American boys. In our analysis of why the perceptions of race changed so dramatically, the nature of our data does not allow us to draw causal links to any particular task or event. However the evidence did highlight that the group changed its view. One of the more direct explanations for why this might have occurred came from first time teacher Mr. Bronson. He explained his changing by saying, “One of the teachers that was very influential in a lot of our children’s lives was a fourth grade teacher who is a Caucasian male. He had a great impact on the children, but mainly because he did something that teachers should all do, in fact more so, and that’s get to know students.” Ultimately, the team of board members and teachers seemed to reprioritize their conception of how raced mattered in the teaching of Black Boys. At the end of the year, they continued to believe that race mattered, but in a different way. They argued that teachers must understand the culture of their children and should teacher accordingly. However, they no longer emphasized that instruction come from white teachers. All involved moved towards valuing pedagogy and a connection to students over simply having a team of African-American educators.
Building Parental Partnerships

A third and final change in perspective involving the school’s design was an assumption that the school’s success was contingent on building strong connections between the school and parents. The results of our survey indicated the board and the teachers held different views on the importance of parents as the year went on (See Figure 7). Essentially, Board members were more likely than teachers to agree that the parents were one of the primary assets to the school (Teacher Mean=2.25, Board Mean=3.22, p=0.005). One question stated, “Parents are a primary asset at the school,” but was seen differently throughout the year. At the beginning of the year, Board members were marginally more likely to agree that the parents were a necessity to

Figure 7. Changing Perceptions about Impacting Parent Partnerships

Banneker school’s success (Teacher Mean=2.00, Board Mean=3.22, p=0.052).

As indicated in Figure 7, all groups grew less convinced of the importance of the parents to the success and failure of the school. From the beginning to the end of the year, a significant change in Board members’ beliefs about the involvement of parents suggested a collective growth
toward a more common understanding. Board members were less likely to agree that the parents were more involved in the school compared to other schools (p=0.025). Ultimately, there was a change in the groups’ perception of parents and their role in the school, which led us to explore this questions qualitatively.

A Focus on Parents as Necessity

There was a group of leaders who focused on the role of parents in the school’s operation at the beginning of the year. Mr. Barham suggested, “Well, I’ve always thought that the secret sauce for all success in school is parental involvement.” Another board member, Mrs. Washington, expressed her perception that parental involvement was a critical component of school success by saying, “I learned it's absolutely critical, and I learned that our school actually has a good, strong group of parents who are committed to the success of the school and who are willing to put in numerous hours to make sure that the school is run well, and every time I go to the school, I see more news and information, and I know that is parent-driven.” These very optimistic perspectives showed how the school entered into its design with the intention of relying on effective parent relationships to drive the school’s success.

Changing Expectations of Parents

Over the course of the year, we noticed a shift in the leadership’s expectations of the parents. Initially, the board described parents as integral to the school’s success. This approach was evidenced by the variety of activities designed to involve parents. Prior to the year, Mr. Washington, a board member, explained their approach. He suggested, “So we have some good things in place for a young school that will aid our parents and will support the school culture.”
His perception was similar to Mr. Barham who explained, “Well, promotion of parental involvement [is important]. We definitely had the parent cafés, so we definitely solicited the parents for all field trips.” He highlighted a unique practice known as parent cafés. These biweekly meetings were drop in meetings where parents were encouraged to visit the school and discuss challenges with the principal and board members. These meetings were met with poor attendance and seemed to damper the school perception of their potential to integrate parents into the activities of the school.

Despite this, the school’s leadership maintained a focus on parents and perceived their parental relationships as successful. Board member Lawrence Trestin offered an insightful assessment of their success and failure with parents as he explained:

Yes, I would say, in addition to [Harambee circles], definitely, the parent cafés and the dad’s group is the primary vehicle [for parents]. Other than [that], I would say, where we have our open houses and other, sort of, school-wide events to get the parents, as well as the broader community engaged. They are aware of what’s going on, aware of opportunities where support is needed, we gave them, I would say, an expectation that the parents would be involved.

In his post year assessment of the school’s success and failure of building parent relationships, Mr. Thompson suggested the school was successful in offering an “expectation” of parental involvement.

Despite the board’s optimistic vision of parent involvement and post year reflections questioned the effectiveness of these parent involvement strategies. Principal Jahir explained, “And I know by the end of the school year, we changed the culture and changed the mindset for a lot of our students and our families.” His report of a changed culture paralleled the board’s perception that they were effective in communicating a culture that required parents to get involved.
Although some perceived the process to be successful, others offered a slightly different evaluation. First year teacher Mr. Bronson explained, “We did not have a [high level of parent engagement], which is a learning experience. Just dealing with people as a whole and learning their ‘dos’ and their ‘don’ts’ and their ‘wills’ and ‘will nots’, but, again, I can say it was learning lesson.” This reflection that they learned about the challenges of building a culture of parental participation emerged as a commonly discussed area of growth. A telling example of this came from a post evaluation of Mr. Barham who explained how building a culture of parent participation was a slow process:

Once parents started to feel a lot more connected by bringing them together and by parental ambassadors, I should say, we generated and provided the camaraderie amongst the parents and get them activated and let them know how they can be a strong part [of the school]. And how they need to be a strong part of the school system that we have provided for their students and their children because once they did that, I think it did change for the better.

Their reflection of how changes in practice helped to shape the culture of the school reflected their message of growing understanding about how to build a parent culture. In this excerpt leadership described how they added a role known as the “Parental Ambassadors” to recruit parents to participate in their three parental activities: Harambee Circles, parent cafés, and the Dad’s Group. Each served a different role. The Harambee Circles were large African-centered affirmation and vision casting events, the parent cafés were office hours with food, and the Dad’s group was an activity driven group dedicated to seeing the dad’s play an active role in the school. Together they were slow to catch on, until the school reevaluated its approach and added the role of Parent Ambassadors to generate group leadership among the parents. Ultimately, it appeared that the school’s leadership grew to understand the complexities of generating successful parent relationships at the school.

**Reevaluating and redirecting parent relationships**
In their reflections during the post interview, the school’s leadership made specific suggestions for how they could improve the school’s parent involvement. Some of the strategies suggested included using exit interviews for families ending their enrollment with the school, and offering food and providing childcare. What emerged as intriguing in this post year reflection was the manner in which many of the leaders perceived the parent relationship as a lost opportunity.

Mr. Barham explained how he thought that could have been avoided with better parent relationships:

Now, it was really hard to say why we lost those students because our administration did a terrible job of following up with those parents and having conversations or some kind of exit interview to find out why they were gone (Michael Barham).

His thoughts that the school should have hosted an exit interview for students who departed from the school offered an interesting reflection on parent relationships. When asked to discuss how parents impacted discipline Mrs. Norris explained, “Well, I guess, maybe if they held [parent cafes] on a particular hour, where most parents are able to come, and then offer some type of incentive. I hear food works really well.” She suggested that the time of the parent cafes did not promote attendance in a meaningful way. Finally, Principal Jahir offered a similar lens on the quality of parent participation. He explained, “I think just to also push it a little bit further, I really believe that we could have done a better job trying to engage and enfranchise our parents.” Collectively, these perspectives highlighted how the leadership struggled to keep parents engaged in the school’s activity. Given the school’s early focus on making sure parents were involved, the expressions of difficulty highlighted how challenging it turned out to be.

A reflection of the data showed how the school changed its perspective in three critical ways. First, they learned to value racially focused professional development. Second, they grew less convinced of the need for African-American teachers. Third they learned to refocus the
structure of parent involvement to make it easier for parents to attend. What emerged was a learning curve, where the school discovered its assumptions about race and culture were often inaccurate and in need of revision. The section that follows provides a reflection on this learning process.

**Conclusion**

The results of this study identified three critical areas where the school learned how to better provide quality STEM education to African-American boys. Despite the best intentions, the school found itself attempting to implement a school design without the benefit of sound empirical research to base about race and education to inform the school’s design. Said differently, the school’s professional development, understanding of the role of race in teaching, and their parental involvement strategy were ultimate informed by folk understandings of best practices instead of sound vetted understandings of what works for African-American boys. This challenge was made clearest in what the school learned about professional development, race and teaching, and its power to engage parents in meaningful school-based interaction. In the end, the school’s leadership learned a great deal about how to build an environment for African-American boys, unfortunately this first year came at the expense of those young people attending the school in its nascent stages.

**Returning to the Research Questions**

Originally, we sought to answer two basic research questions: (1) What did the school’s leadership learn about designing a STEM school for African-American boys? And (2) What areas of change emerged as most significant over the course of the first year? In reflecting on the first question, it became clear that the school learned to differentiate between a number of myths associated with urban schooling and the reality of providing young people with a high quality
Myth #1: Colorblind Professional Development

The first major change in perspective was associated with the team’s growing understanding of the necessities of ongoing professional development. Initially, much of the discussion about teacher training and preparation involved one-day trainings about the role of culturally relevant pedagogy. These training were provided by some of the nation’s leading voices on approaches to CRP. What the team learned was that such an approach was insufficient for producing excellent pedagogy.

Although both groups were disappointed in the professional development, the teachers and the board members maintained dramatically different perceptions of the type of training the school offered. The board members were more likely to communicate the idea that they offered the teacher’s training that prepared them to work with African-American boys. On the contrary, teachers expressed frustration that training did not adequately prepare them to teach that demographic. The teachers argued that the professional development focused on use of curriculum at the cost of preparing teachers to teach African-American males.

So what can be learned from this challenge? First, a great deal of the research about professional development highlights how ongoing, task driven (e.g. video analysis), professional development yields the best outcomes for schools (Borko, 2004a, 2004b; Kwang Suk Yoon, Teresa Duncan, Silvia Lee, Beth Scarloss, & Kathy Shapley, 2007). How could a school know that an ongoing professional development program would be best suited? Where could a school find
information about professional development on African-American boys? More specifically, how could teachers earn teaching credentials and certification from Teach For America and teacher education programs and emerge feeling as though they were unprepared to teach African-American boys? Ultimately, this study documented how a school was in need of critical information about how to train its teachers and how to train teachers to work in an urban community.

**Myth #2: Race as Important, but Pedagogy as Primary**

Confounding the issue of a school starting without the capacity to prepare its teachers to teach its primary demographic is the issue of “who” the school hired to teach these students. In one of the most striking revelations of the study, the founder explained, “So, there were a lot of myths that we were guiding us.” He explained how the school sought to provide students two things simultaneously. First, they wanted to provide students with high quality teaching. Second, they wanted that teaching to come from African-American male role models. After the year, this sentiment emerged as one of the most significant changes in perception over the course the year. The leadership team initially saw these two as complementary and necessary. At the conclusion of the year, the school was nearly unanimous in its belief that pedagogical skill took precedent over being a role model. This change highlighted how important issues of race were at the outset of the year and how perceptions of race changed throughout the first year.

Does this mean that there is no need for African-American teachers? We would argue that this result means that pedagogy takes precedent over representation and role modeling. They discovered that role models come in diverse forms; but high quality pedagogy is vital. This finding contradicts scholarship from Dee (2004) that highlights how having teachers of the same
race did not translate directly to academic achievement. In an experimental study conducted in Tennessee scholars identified how pairing students by race produced increased math and reading achievement for both black and white students (Dee, 2004).

**Myth #3: The Power to Involve Parents**

The third myth revealed in this study is associated with improving the role of parent involvement. Much of what the school wanted to do included theories of getting their parents more directly involved in education of their children. The school specifically focused on getting fathers involved in the school’s activity. As the results above highlight, the team grew less optimistic about this and felt less capable of getting parents heavily involved.

The questions of why this challenge emerged can be found in the basics of economics and scheduling. Where this school was accurate and optimistic was in their assumption that father’s want to be involved and are a part of their children’s lives. Many urban schools operate on stereotypical perspectives about absent fathers. Benjamin Banneker focused on fathers, but ignored the basics of economics. These men needed to work and offering parent café’s, and fatherhood meeting during critical working hours proved to be ineffective.

The shift from optimism about being able to offer a structure that would build successful parent-school relationships towards a framework where the school leaders sought to control as much of the interactions of the children as possible without necessarily including parents highlights a shift in framing. In our analysis, this shift was a result of the school’s leadership making two critical assumptions. Assumption one involved the idea that schools do not create spaces where parents can come and help their student build healthy identities around race and education. The Banneker school did this by offering Harambee Circles, Parent Cafes, and
Fatherhood groups to help prepare fathers to be the primary educators. Assumption two involved the idea that parents, fathers in particular, would be able to attend these meetings if offered. This assumption ultimately undermined the effectiveness of the parental approach. Ultimately, offering morning cafes between the hours of 7:30 am and 9:00am and afternoon men’s groups meeting 3:00pm to 5:00pm did not reflect the reality of the father’s work responsibilities. Instead of blaming the school for poor planning, this study highlights how needing to rely on conjecture and assumption ultimately limited the school’s design. The Banneker school was in dire need of sound theoretical and practice research to guide its design.

**Theory to Practice**

Finally, the results of this project highlight the fundamental limitations between school practice and academic knowledge. As scholars discuss issues of race, culture, and schooling little of that research offers pragmatic applications that can be used to support the teaching and learning of Black Boys. In this particular case, issues of professional development, the race of the teacher, and parent involvement were ultimately undermined by a lack of vetted knowledge. If scholars knew more about how to teach STEM to African-American boys in impoverished communities, school leaders like those in the Banneker school could move from operating by myths to operating schools based on sound theory to practice relationships.
Literature Cited


10.1162/003465304323023750


### Appendix: Reliability Assessment

| View of Parents | PRE SURVEY | | | POST SURVEY | | |
|-----------------|------------|-----------------|-----------------|-----------------|-----------------|
|                 | Reliability Statistics | Item-Total | Reliability Statistics | Item-Total |
| The parents in our school are very involved compared to other schools. | N | Cronbach's Alpha | N | Cronbach's Alpha |
| Q2 | 0.852 | 4 | Q22 | 9.25 | 3 | 0.821 | 0.764 | 0.706 | 4 | Q22 | 8.88 | 6 | 0.459 | 0.662 |
| Our school offers multiple opportunities for the parents to be involved. & Q23 | 8.81 | 6 | 0.639 | 0.852 | 2 | Q23 | 8.13 | 8 | 0.867 | 0.361 |
| Parents are one of our primary assets at this school. | Q25 | 9.06 | 9 | 0.689 | 0.814 | 6 | Q25 | 8 | 7 | 0 | 0.852 |
| Parents know how important their involvement is to the success of our school. | Q27 | 9.25 | 3 | 0.74 | 0.79 | 3.35 |
| Students have multiple opportunities to generate knowledge. | Q3 | 0.731 | 3 | Q18 | 6.44 | 6 | 0.501 | 0.725 | 0.679 | 3 | Q18 | 6 | 3 | 0.718 | 0.25 |

*Note: Q1 = 2*
### Students’ behavior determines academic success.

<table>
<thead>
<tr>
<th>Q4</th>
<th>Item-Total Reliability Statistics</th>
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<th>a Q1 = 2</th>
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<tbody>
<tr>
<td>Q30</td>
<td>6.25</td>
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<td>0.452</td>
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At our school we focus on developing our abilities to teach African-American Males.

### Parents want to be involved in the day-to-day functions of our school.

<table>
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<tr>
<td>Q38</td>
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### Teachers use a variety of strategies to engage students in learning.

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<td>Q42</td>
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### Our school uses a variety of assessments.

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<td>Q28</td>
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### Community members are assets to our school.

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<td>Q26</td>
<td>16.3</td>
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### Schools has no responsibility to provide social or other non academic services to the community.

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### Multi-Modal Reliability Statistics

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Teachers use a variety of strategies to engage students in learning.

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Our school uses a variety of assessments.

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Community members are assets to our school.

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Schools have no responsibility to provide social or other non-academic services to the community.

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Norms

Students should feel a sense of responsibility for their classmates. Positive reinforcement is most effective with African-American boys.

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### Classroom Layout is Important for Student Success

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<table>
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### Views of Success

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### Curriculum

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