

Culturally Responsive Collegiate Mathematics Education: Implications for African American Students

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In this article, the author utilizes the culturally congruent work of Gay (2010) and Ladson-Billings (2009) to highlight culturally responsive teaching as a viable option for African American students in higher education mathematics spaces. He offers translations of Gay and Ladson-Billings' work to Africana mathematics and argues that these practices increase access to rigorous culturally responsive mathematics and enact the brilliance that African American students bring to the mathematics space (Leonard & Martin, 2013). The author also challenges postsecondary educators to allow culturally responsive practices to shape their instructional practices. In addition, he shares future research directions for African American students in mathematics, preservice mathematics teachers, and mathematics professors.

Keywords: culturally responsive teaching, mathematics education, African American students, higher education, Africana mathematics

“Don't focus on race; focus on math.” These words stood out to me as I read my course evaluations. I am an African American male mathematics professor in the Department of Mathematics. I teach mathematics content courses to preservice teachers. Some students believe my teaching practices and perspectives of mathematics education might be relegated to what is discussed in a mathematics methods or cultural diversity course. However, as I reflected on this student's comment the following questions permeated my thinking: Have students categorized courses and operationalized course objectives based on course titles alone? Do students have restrictions on how mathematics content should be covered? Has the schooling process and/or structure infiltrated students' thinking to the point where they dismiss pedagogical practices that explore the intersectionality of race and mathematics through culturally relevant practices? Does the mathematics (education) literature critically analyze racial inequities among other injustices? Lastly, if race and other cultural constructs cannot be brought to the forefront when extrapolating mathematical concepts and ideas, what academic discipline(s) is it safe to perform such analyses?

Scholars who have expressed concerns about White racial domination in teacher education (e.g., Hayes & Juárez, 2012; Jett, 2012b; Sleeter, 2001) have discussed specific ways in which Whiteness operates in teacher preparation programs and how the ideas of the dominant culture seem to propagate in certification programs. In the field of mathematics, these ideas are more pronounced because many teacher educators, curricula, and textbooks frame mathematics as a White male enterprise. Stinson (2010) responds to this dilemma through his work on mathematically successful African American male students negotiating the “White male math myth.”

Deficit-oriented ideological paradigms and treatises, such as achievement gap² discourse, often frame students of color, particularly African Americans, as mathematically deficient. This theoretical concept has caused some preservice teachers to enter our nation's classrooms with preconceived notions about the mathematical (dis)abilities of African American students (Hilliard, 2003; Martin, 2009b). Sadly, these deficit paradigms have significant implications for teaching mathematics and student learning outcomes. One way to reverse this trend is to employ culturally responsive pedagogy in mathematics courses starting with the underlying premise that African American students bring brilliant mathematical cultural inclinations to the mathematics classroom space (Gay, 2010; Ladson-Billings, 2009; Leonard & Martin, 2013).

In my undergraduate mathematics content courses, I have noticed that some students have assimilationist paradigms that are heavily influenced by what they are learning in other teacher preparation courses, course readings, and/or "urban" school placements. The discussions in this article explore aspects of how to teach mathematics in ways to address the mathematical needs of African American students. The arguments presented may also be beneficial to other students of color in that the African American experience is not a monolithic one, and all African American college students do not possess the same mathematical needs (Delpit, 2012). My main objective is to position culturally responsive pedagogy as a viable teaching framework for capitalizing on the mathematical brilliance that African American students bring to college spaces (Leonard & Martin, 2013).

First, I describe the dangers of not employing culturally responsive teaching in mathematics spaces of higher education for African American students. Next, I discuss the tenets of culturally responsive teaching from two leading scholars (i.e., Gay, 2010; Ladson-Billings, 2009) and extrapolate their tenets in light of Afrocentric (Asante, 1998) African mathematics. Then, I share reflections of my continuous journey of being a culturally responsive mathematics pedagogue. I also share recommendations for future research regarding African American students and the associated higher education mathematics landscape. I conclude by urging all mathematics professors to be more culturally responsive in their respective domains.

College Mathematics Space as an "Identity Thief"

One of the ways I integrate literature into mathematics instruction with preservice teachers is through a discussion of Lichtman's (2008) text, *Do the Math #1: Secrets, Lies and Algebra*. In this mathematics-themed literature text, one chapter is devoted to the number zero, which Lichtman describes as an "identity thief." Lichtman obtains this alias by alluding to the fact that multiplying any number by zero yields zero. As a mathematics professor, I understand zero's culturally rich background and the inclusion or exclusion of zero from various counting and number systems. Also, I know the significance of zero and understand the implications of zero regarding the mathematical enterprise. Nonetheless, after reflecting more deeply and critically on zero as an "identity thief" and my arguments concerning culturally responsive teaching, I likened this metaphorical example to the mathematics realm. By so doing, I pose the following questions: Do we have identity thieves disguised as mathematics instructors or professors in our mathematics

² I do not ascribe to achievement gap discourse and rhetoric. Such discussions should focus on providing African American students with culturally appropriate instruction so that African American students can rise to heightened levels of academic excellence. See Hilliard's (2003) discussion about the quality-of-service gap to obtain a different perspective regarding achievement gap discourse.

spaces in higher education? Asked differently, are some mathematics professors in one way or another serving as identity thieves as it pertains to the mathematical and cultural identities of African American students?

My experiences suggest that, indeed, there are identity thieves among us. For example, in the African American church where I attend, such a thief comes to kill, steal, and destroy (John 10:10, King James Version). Hence, someone who diminishes African American students' cultural and mathematical identities and causes them to feel mathematically incompetent is emblematic of an "identity thief." We know how detrimental it can be when someone's identity is stolen. Oftentimes, it is an arduous journey, one that could take many years to recover. Intersecting this phenomenon of "identify thief" with mathematical brilliance and culturally responsive teaching, it becomes evident that professors who lack culturally responsive tenets are consciously and/or subconsciously stealing the identities of African American students, thereby causing some students years to recover their natural mathematical states, if they return to them at all.

Even when I was a conscientious mathematics student during my undergraduate and graduate studies, I can recall how some mathematics professors sought to rob me of my mathematics identity. Also, I remember conversations among my peers concerning which mathematics professors to avoid. This was not an objection to someone who was challenging and pushing us to become astute mathematical thinkers, it was a rejection of identity thieves who sought to lower mathematics expectations and dehumanize our African experiences. Sadly, I have seen identity thieves in action at Historically Black Colleges and Universities (HBCUs) and Predominately White Institutions (PWIs) alike. Valenzuela (1999) described a parallel scenario in *Subtractive Schooling: U.S. Mexican Youth and the Politics of Caring*. In this scenario, Valenzuela elaborates on the experiences of Mexican American students in an inner-city high school whose schooling experiences invalidated them. This text substantiates the essence of my argument that such schooling practices subtract from students' longstanding culturally rich and mathematically robust identities.

The 2011–2012 mathematics major completion data reflect 819³ African American mathematics majors in comparison to the 15,993 of mathematics majors produced nationally (U. S. Department of Education, 2013) during the aforementioned academic year. The percentage of African American mathematics majors (approximately 5.12%) earning an undergraduate degree is alarming given the correlation between students majoring in mathematics and faculty pedagogy (Seymour & Hewitt, 1997). As a result, effective mathematics teaching at the collegiate level has implications not only for recruiting more African American mathematics majors but also for attracting African American students to mathematics teaching.

This phenomenon might lead one to speculate why some African American students would choose to major in a discipline such as mathematics when it can be orchestrated to steal their identities. Given the underlying influence of mathematics among other academic disciplines, what might this "identity thief" concept mean for colleges and universities as it pertains to retention? What are the implications of this practice in relation to Science, Technology, Engineering, and Mathematics (STEM) education, given current efforts to promote STEM education and broaden the STEM pipeline? A sadder phenomenon is that identity thieves are populated in other intellectual traditions

³ The 2011–2012 data show that 415 Black or African American men earned an undergraduate degree in mathematics, and 404 Black or African American women earned an undergraduate degree in mathematics.

in educational spaces. Imagine the degradation experienced when being “schooled” by an entire department whose faculty members are comprised predominantly of identity thieves. My hope is that mathematics professors are not guilty of being identity thieves of African American students. Instead, I urge these professors to recognize the brilliance in African American students as well as other students of color, and discuss culturally responsive teaching as a pedagogical framework to manifest their brilliance in academic settings.

Culturally Responsive Teaching

Culturally responsive teaching is a pedagogical framework that recognizes and affirms the diverse cultural backgrounds and experiences students bring to the classroom space (Gay, 2010). This cultural knowledge extends to students’ familial and community knowledge systems, and their rich cultural proclivities are used as a catalyst for learning across the content areas.

Ladson-Billings (2009) defined culturally relevant pedagogy as one that “empowers students intellectually, socially, emotionally, and politically by using cultural referents to impart knowledge, skills, and attitudes” (p. 20). Gay (2002) defined culturally responsive teaching as “using the cultural characteristics, experiences, and perspectives of ethnically diverse students as conduits for teaching them more effectively” (p. 106). Thus, culturally responsive pedagogy affirms, liberates, and empowers culturally diverse students (Gay, 2010).

As it stands, culturally responsive teaching has been used as both a pedagogical framework and a theoretical construct among practitioners and researchers. In this article, culturally responsive teaching is used as a pedagogical construct. I borrow heavily from Gay (2010) and Ladson-Billings’ (2009) research on culturally relevant teaching and use their pedagogical frameworks to influence my scholarship as well as drive instruction in my mathematics content courses. Figure 1 presents the tenets of culturally responsive teaching as outlined by Gay and my explanation and translation of Gay’s tenets to Africana mathematics.

In a similar vein, Ladson-Billings (2009) describes the fundamental as well as the social relations of culturally relevant teaching. Although Ladson-Billings shares many epistemological characteristics of culturally relevant teaching, my discussion focuses exclusively on the five contextualized classroom recommendations. Figure 2 summarizes recommendations for the culturally relevant classroom offered by Ladson-Billings and my translation of Ladson-Billings’ work in terms of its implications for Africana mathematics practices.

Taken together, the works of Gay (2010) and Ladson-Billings (2009) provide the pedagogical frameworks for my instructional practices. Their research makes a significant contribution to the field, and their work provides the underpinnings from which current work on culturally responsive teaching is grounded. Regarding my own pedagogical practices, the works of Gay and Ladson-Billings have assisted me on my continuous journey of becoming a culturally responsive mathematics professor who continuously draws from the brilliance of African American students in transformative ways (hooks, 1994; Leonard & Martin, 2013). In what follows, I articulate my belief system regarding culturally responsive pedagogy drawing from my teaching practices.

Figure 1. Tenets of Culturally Responsive Teaching and Africana Mathematics

Culturally Responsive Teaching (Gay, 2010)	Explanation	Translation to Africana Mathematics (Jett, 2013)
<p>1. Culturally responsive teaching is validating. It teaches to and through the strengths of students to affirm their own and other students' cultural heritages.</p>	<p><i>Culturally responsive educators validate students' cultures, knowledge systems, and experiences when engaging in the mathematics teaching and learning dynamic.</i> Examples include: creating learning environments to capitalize on cultural differences, disrupting the mathematics terrain as a space relegated and invented by the dominant culture, and challenging stereotypes concerning who can be high-achievers in mathematics.</p>	<p>Africana mathematics capitalizes on African American knowledge to inform the mathematics curriculum and it affirms African American students as competent mathematical thinkers.</p>
<p>2. Culturally responsive teaching is comprehensive. It teaches the whole student and holds students accountable for their own learning as well as one another's learning.</p>	<p><i>Culturally responsive pedagogues engage in comprehensive teaching.</i> By so doing, they help to sustain the African American cultural identity. This precept is enacted with an ethos of success in mathematics spaces and it involves teaching the "whole" student.</p>	<p>Africana mathematics establishes the learning environment as a community of learners and utilizes this aspect to create a culture where mathematics and cultural identities thrive.</p>
<p>3. Culturally responsive teaching is multidimensional. It taps into multiple perspectives and experiences to make instruction more responsive to ethnic diversity.</p>	<p><i>Culturally responsive teachers draw from multiple dimensions.</i> These dimensions include other academic disciplines such as language arts, music, art, and history, to name a few, to augment the mathematics learning process. Teachers do this by using students' cultural knowledge to anchor instruction.</p>	<p>Africana mathematics draws from different dimensions to showcase the mathematical contributions of African American scholars as well as other marginalized scholars of color.</p>

Figure 1 (Continued)

Culturally Responsive Teaching (Gay, 2010)	Explanation	Translation to Africana Mathematics (Jett, 2013)
<p>4. Culturally responsive teaching is empowering. It empowers students to become more successful learners and human beings in society.</p>	<p><i>Culturally responsive teachers empower themselves and thus seek to manifest this same self-empowerment and self-efficacy in their students.</i> This empowerment tenet, like other principles, is contagious.</p>	<p>Africana mathematics empowers students to engage in challenging, rigorous mathematical practices and problems embodying the brilliance legacy from which they have come. African American students are made to feel mathematically empowered to complete demanding mathematics tasks, scholastic activities, and learning designs. Further, students believe that their mathematical competence is strengthened as a result of experiencing empowering mathematics pedagogy.</p>
<p>5. Culturally responsive teaching is transformative because it combines academic success with cultural competency to bolster transform-ative education.</p>	<p><i>Culturally responsive educators create culturally transformative mathematics learning sites.</i> With this tenet, Gay (2010) asserts: “academic success and cultural consciousness are developed simultaneously” (p. 36). The purpose for African American students is two-fold. First, to transcend the cultural hegemony entrenched within mathematical textbooks, curricula, and other instructional resources. Secondly, to transform societal ills and ameliorate their brilliant intellectual paradigm.</p>	<p>Africana mathematics transforms traditional mathematical practices in that mathematical brilliance is coupled with Africana epistemology to achieve success on many fronts.</p>
<p>6. Culturally responsive teaching is emancipatory. It grounds multiculturalism in the teaching and learning process to challenge mainstream canons of knowledge.</p>	<p><i>Culturally responsive pedagogues work to emancipate the learning process by exposing students to other people’s/multiple “truths.”</i> Using this ontological position, they create opportunities for students to free their minds and be emancipated. Drawing from Martin’s (2009b) work, I have written about liberatory mathematics instruction in other spaces (see e.g., Jett, 2009; also see hooks, 1994 for discussions about teaching to transgress, which closely aligns with this tenet of culturally responsive teaching).</p>	<p>Africana mathematics makes authentic knowledge about ethnomathematics accessible to students with goals of liberating their minds and validating their keen mathematical identities.</p>

Figure 2. Contextualized Classroom and Africana Mathematics

Contextualized Classroom (Ladson-Billings, 2009)	Explanation	Africana Mathematics (Jett, 2013)
1. Culturally relevant teachers treat students as capable learners and teach their content to the highest standards.	<i>When students are treated as competent, they are likely to demonstrate competence.</i> Culturally relevant mathematics teachers treat students as brilliant mathematical thinkers and expect students to demonstrate such mathematical brilliance in the classroom space. They use challenging and rigorous mathematics tasks, and they make certain that African American students exhibit the brilliance that resides within them to complete intellectual mathematics.	Africana teachers of mathematics start with the premise that African American students are brilliant and expect students to enact the brilliance that resides within them to excel in mathematics.
2. Culturally relevant teachers provide instructional “scaffolding” to promote optimal levels of academic success.	<i>When teachers provide instructional “scaffolding,” students can move from what they know to what they need to know.</i> Culturally relevant mathematics instructors scaffold instruction. In other words, they add to and support the mathematics learning process by building on students’ prior knowledge, and this prior knowledge is inclusive of students’ cultural knowledge systems, skills, and experiences.	Africana teachers of mathematics connect African American students’ cultural funds of current mathematics knowledge to cultural funds of future mathematics knowledge.
3. Culturally relevant teachers keep learning as the central focus of the classroom. In other words, instruction is foremost.	<i>The focus of the classroom must be instructional.</i> Culturally relevant mathematics educators center the focus of the classroom climate on instructional knowledge and ensure that learning takes place. The mathematics classroom is embraced as a place where all are involved in intellectual work (i.e., both teacher(s) and student(s)). Learning remains at the center of the classroom space, and instructional practices are geared toward this goal.	Africana teachers of mathematics embrace the learning environment as one where all are involved in the mathematics teaching and learning dynamic.

Figure 2 (Continued)

Contextualized Classroom (Ladson-Billings, 2009)	Explanation	Africana Mathematics (Jett, 2013)
4. Culturally relevant teachers extend students' thinking and abilities by building on what students already know.	<i>Real education is about extending students' thinking and abilities.</i> Culturally relevant mathematics teachers build on students' strengths and extend this newfound knowledge into their science of teaching and learning. African American students' situations, scenarios, and experiences are mathematized, and this extension leads to authentic learning and "real" education.	Africana teachers of mathematics unravel African American students' mathematical gifts and construct meaningful mathematics experiences that build on prior knowledge.
5. Culturally relevant teachers possess in-depth knowledge of the students and the mathematics content.	<i>Effective teaching involves in-depth knowledge of both the students and the subject matter.</i> Culturally relevant mathematics teachers possess a profound understanding of their students as well as the mathematics content knowledge. They form "real" relationships with their students, and these affirming relationships augment the mathematics learning space.	Africana teachers of mathematics delve deeper to form genuine relationships with their students. Thus, these intimate relationships are translated into heightened levels and expectations for mathematical performance.

My Culturally Responsive Instructional Practices

My mathematics teaching is governed by culturally responsive pedagogy, and I draw from the research on culturally relevant pedagogy and theories of culturally responsive teaching to guide my practices. The pedagogical frameworks of Gay (2010) and Ladson-Billings (2009) are invaluable to my teaching and scholarship as well as my work with African American students. I also utilize the works of other scholars who employ culturally relevant practices and are multicultural in their approach (e.g., Au, 2009; Chahine, 2013; Chartock, 2010; Le, Menkart, & Okazawa-Rey, 2008; Leonard, 2008; Matthews, Jones, & Parker, 2013; Nieto, 2010). Because I am deeply committed to the mathematics education of African American collegians, I work diligently to ensure that they tap into the brilliance that resides within them.

Writing about African American children in classroom spaces, Delpit (2012) shares: “If we do not recognize the brilliance before us, we cannot help but carry on the stereotypic societal views that these children are somehow damaged goods and that they cannot be expected to succeed” (p. 5). Being among a cadre of mathematics educators who recognizes the mathematical brilliance of African American students (Berry, 2008; Cooper, 2000; Jett, 2010, 2011; Lemons-Smith, 2013; Leonard & Martin, 2013; McGee & Martin, 2011; Moody, 2000; Stinson, Jett, & Williams, 2013; Thompson & Lewis, 2005), I share Delpit’s sentiments that: “There is no course in the college curriculum that should not include the contributions and perspectives of African Americans” (p. 187). Further, I embrace and enact this ideological position in the mathematics classroom by not only exposing students to Africana contributions to mathematics, but also offering viewpoints from African American scholars and contextualizing mathematics problems to the cultural needs of African American students (e.g., see Ladson-Billings, 1997; Martin, 2009b; Williams, 1997). I do so by enacting the principles of culturally responsive teaching.

Given my role as a mathematics professor, I am in a unique position to teach mathematics content courses to preservice teachers who might later find themselves in an elementary, middle, or secondary level classroom of culturally and ethnically diverse students. In my courses, I begin instruction with the brilliance of Black and Brown children in mathematics (Leonard & Martin, 2013). Themes such as empowerment and liberation run rampant throughout my teaching practices. My hope is that my students will reflect on culturally responsive teaching and seek to be culturally responsive in their pedagogical practices. I do not wish for my students to become a clone of me or seek to position my work as if I have all of the answers to mathematics education’s ills. Rather, I hope that they will carve out their own niche to produce fruitful outcomes for African American students. In my effort to implement culturally responsive practices in higher education, I highlight some of the things that I do in my instructional practices. While this list is not exhaustive, it is a starting point for reflection and action for those who might be inclined to be more responsive to the needs of African American collegians.

First, I treat African American college students as mathematically competent cultural beings and spread messages of brilliance (see Jett, 2012a; Leonard & Martin, 2013) in relation to their mathematical perspicacity. By using brilliance discourse and being intentional and deliberate in doing so, I empower students to take hold of and internalize positive affirmations concerning their mathematical abilities. This empowerment summons students to not only let their mathematical brilliance shine, but also to let their cultural ingenuity inform their work. In other

words, students are empowered to use mathematics as an analytic tool to examine socially just issues, analyze community issues, investigate policies and practices, dissect problems within their academic fields, and so forth.

Next, I solicit information from students about their cultural heritage, interests, and strengths. I draw from this information heavily throughout the semester to design mathematics tasks, problems, and projects as well as to validate students' cultural identities in the mathematics space. This practice is consistent with one of the missions of culturally responsive teaching: to be a "student" of diverse learners, using their cultural norms and practices as a catalyst for learning (Gay, 2010; Ladson-Billings, 2009). And, it goes beyond changing the name of a student in a mathematics word problem to the name of a student in the class; or, devising a mathematics problem to coincide with a particular holiday (Le et al., 2008). Rather, it is an authentic practice grounded in students' cultural experiences and legacies.

Also, in my mathematics courses I listen to and value my students' voices and embrace critical dialogue, whether it happens in small collaborative problem-solving groups or as a professional learning community. Collaboration and community building are prominent attributes of my mathematics courses, and these ideas are congruent to culturally responsive teaching (Gay, 2010). With small groups, the mathematical objectives, needs of my students, and need to ensure that students are exposed to multiple diverse mathematical perspectives and histories are the bases upon which group dynamics are formed. Utilizing mathematical concepts and theories, students' thinking patterns (as well as my own) are extended, and they draw upon their cultural and interdisciplinary knowledge bases to engage in rigorous mathematics.

Although my mathematics practices are not all-encompassing of culturally responsive teaching, efforts are being made to teach preservice teachers how to infuse culturally responsive practices at the K–12 levels, despite very little being done at the collegiate level to make mathematics culturally specific to the needs of African American students. What is troubling is that some K–16 mathematics courses taught are void of culturally responsive teaching, whereas other mathematics pedagogues expect students to complete meaningless mathematics tasks and worksheets that do not challenge them but rather serve as a true testament to what some mathematics educators believe to be the mathematics aptitude of African American students. This practice further substantiates my claim that mathematics instructors need to enact culturally affirming mathematics practices that simultaneously challenge African American students in meaningful ways and provide them with access to rigorous, culturally centered mathematics. From what I have experienced and seen at the collegiate level, "true" culturally responsive mathematics pedagogues are rare, especially those that espouse the brilliance of African American students' mathematics abilities. My hope is that all mathematics scholars and practitioners will shift the discourse to more precisely reflect the mathematical promise of African American students.

Future Research

This area of interest has several directions for future research. First, it seems prudent to perform research analyses with African American students concerning their mathematics successes and plights using their own words. This investigation should foreground race/ethnicity in

mathematics education (Martin, 2009a) as well as explore how culture affects their mathematics experiences. Ideas should also be solicited from African American students about ways to be culturally responsive to their needs as mathematics learners. If we are truly committed to being culturally responsive to African American students and capitalizing on their innate brilliance, then we must learn from them.

Second, future research should explore how ideas from the dominant culture are infiltrated in teacher education programs, especially as it pertains to mathematics. Researchers should probe preservice and practicing teachers from all racial groups concerning their ideological paradigms regarding the mathematical abilities of African American students to determine if teachers truly believe in the brilliance of African American students. Another suggestion would be to analyze the mathematical experiences of preservice teachers. One school of thought suggests that teachers teach in a similar manner in which they were taught. If preservice teachers were taught by those who embrace negative stereotypical views about African American students during their K–16 experiences, then how might this inform their pedagogical practices? Moreover, is it possible to expect preservice teachers to be culturally responsive mathematics educators when they have experienced mathematics as a disempowering enterprise themselves? As such, research in this area could produce recommendations to improve preservice mathematics teacher education and assist with supplying high quality teachers responsive to the needs of African American learners.

Next, researchers should initiate conversations with professors who have a track record of being culturally responsive to the needs of African American students. There is much to learn from these professors about sustaining culturally responsive mathematics communities. On the other hand, researchers should initiate conversations with professors who “claim” to meet the needs of African American students. This examination should include immersed observations and systematic interviews with mathematics professors to ascertain their pedagogical practices and perspectives on meeting the mathematics needs of students of color. In other words, researchers should explore whether mathematics professors’ ideological dispositions match how they engage African American students in the mathematics teaching and learning dynamic. As such, future research should critically examine the practices of mathematics professors at colleges and universities with respect to culturally responsive teaching.

Additionally, future work should investigate the culturally responsive practices of STEM professors more broadly. With the current push to produce more STEM graduates, researchers should examine what culturally relevant instructional strategies engage students and attract them to select and persist in STEM majors. The goal is not to produce a “how to” manual about culturally responsive STEM education, but to promote a culture where culturally inclusive transformative practices are implemented in STEM classrooms. These recommendations are merely starting points to make the most of African American students’ inherent intelligence in mathematics.

Conclusion

The need for culturally synchronized mathematics practices for African American college students cannot be understated. Though I am deeply committed to the mathematics education of

all students, I am especially committed to the mathematics education of African American college students and I treat my work of educating students from culturally mediated frameworks as a family matter. My hope is that more culturally responsive mathematics educators work to serve the needs of African American students and capitalize on the brilliance these students bring to the mathematical space. The mathematical enterprise, I believe, rests on this premise.

As I reflect back to the student's comment at the beginning of this article, I now question whether this student was: (a) operating from a positionality of privilege, (b) equating culturally responsive mathematics teaching with only teaching about race, (c) challenged as it pertains to messages of brilliance concerning African American students, (d) guilty of lacking a fundamental belief in the brilliance of African American students, (e) made to feel uncomfortable as a result of a particular mathematics lesson, or (f) experiencing some combination of the possibilities listed above.

While I may have "focused" on race or ethnicity during my mathematics instruction, shouldn't there be teachable moments and applicable lessons learned beyond the mathematics content in mathematics courses? Asked differently, how much more of a critical introspective look should I employ concerning my culturally responsive practices? And, what are the best ways for me to help students make explicit connections between the culturally responsive pedagogical framework and the intellectual tradition of mathematics? By making these connections, am I cheating my students out of making these connections for themselves?

What seems more perplexing, however, is that some students cannot fathom mathematics and culturally responsive teaching as a marriage, rather they view it as an *either/or*. Culturally relevant teaching practices, when coupled with mathematics, can easily evolve into an analytic tool to engage students in critical mathematics discourse, while simultaneously building on their brilliance. However, the current manner in which mathematics is positioned and taught in some spaces subtracts from the cultural and mathematical identities of African American students (Valenzuela, 1999). Now is the time for a more nuanced paradigm shift among college mathematics professors concerning culturally responsive mathematics that is receptive to the needs of African American students.

Unlike K–12 mathematics classroom teachers who have optional or mandated professional development sessions⁴, mathematics professors at the college or university level seldom have opportunities to be exposed to this work. Although there are professional conferences for mathematics professors such as myself, these conferences are typically relegated to research, and many of the spaces at these conferences operate void of culturally responsive pedagogues and substantive discussions regarding the needs of African American students are rare. As mentioned previously, future research should examine the extent of culturally responsive mathematics practices among mathematics professors at colleges and universities. There is a significant gap in the literature regarding culturally responsive mathematics teaching practices in higher education and comprehensive examinations are needed in this area.

⁴ The lack of culturally responsive practices and discussions in mathematics professional development sessions for practitioners is beyond the scope of this paper.

Finally, as it pertains to the “identity thief” discussion, some readers may critique my sentiments and wonder why I use what some may consider as harsh language to describe colleagues with whom I have worked, with whom I currently work, or with whom I might work. While I do not wish for readers to get the wrong impression, the reality is that there are those from different racial and ethnic groups who espouse to culturally responsive teaching and enact such practices in undergraduate mathematics spaces. Whereas, there are others who function in a culturally decontextualized fashion. If we are serious about continuing to produce mathematically successful African American students and broadening the mathematics and STEM landscape, we must remain vigilant in our criticism concerning the lack of culturally responsive practices. My hope is that this article will cause mathematics professors in higher education to reflect, act differently, acknowledge, and capitalize on the mathematical brilliance and cultural resilience of African American students as well as other students of color in their mathematics space.

AUTHOR NOTES

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References

- Asante, M. K. (1998). *The Afrocentric idea: Revised and expanded edition*. Philadelphia, PA: Temple University Press.
- Au, W. (Ed.). (2009). *Rethinking multicultural education: Teaching for racial and cultural justice*. Milwaukee, WI: Rethinking Schools.
- Berry III, R. Q. (2008). Access to upper-level mathematics: The stories of successful African American middle school boys. *Journal for Research in Mathematics Education*, 39(5), 464-488.
- Chahine, I. (2013). Ethnomathematics in the classroom: Unearthing the mathematical practices of African cultures. In J. Leonard & D. B. Martin (Eds.) *The brilliance of Black children in mathematics: Beyond the numbers and toward new discourse* (pp. 195-218). Charlotte, NC: Information Age Publishing.
- Chartock, R. K. (2010). *Strategies and lessons for culturally responsive teaching: A primer for K-12 teachers*. Boston, MA: Allyn & Bacon.
- Cooper, D. (2000). Changing the faces of mathematics Ph.D.'s: What we are learning at the University of Maryland. In M. E. Strutchens, M. L. Johnson, & W. F. Tate (Eds.), *Changing the faces of mathematics: Perspectives on African Americans* (pp. 179-192). Reston, VA: National Council of Teachers of Mathematics.
- Delpit, L. (2012). *“Multiplication is for White people”: Raising expectations for other people’s children*. New York, NY: The New Press.

- Gay, G. (2010). *Culturally responsive teaching* (2nd ed.). New York, NY: Teachers College Press.
- Gay, G. (2002). Preparing for culturally responsive teaching. *Journal of Teacher Education*, 53(2), 106-116.
- Hayes, C. & Juárez, B. (2012). There is no culturally responsive teaching spoken here: A critical race perspective. *Democracy & Education*, 20(1), Article 1. Retrieved from <http://democracyeducationjournal.org/cgi/viewcontent.cgi?article=1023&context=home>
- Hilliard III, A. G. (2003). No mystery: Closing the achievement gap between Africans and excellence. In T. Perry, C. Steele, & A. G. Hilliard, III, *Young, gifted, and Black: Promoting high achievement among African-American students* (pp. 131-165). Boston: Beacon Press.
- hooks, b. (1994). *Teaching to transgress: Education as the practice of freedom*. New York, NY: Routledge.
- Jett, C. C. (2012a). Critical race theory interwoven with mathematics education research. *Journal of Urban Mathematics Education*, 5(1), 21-30.
- Jett, C. C. (2012b). Let's produce culturally responsive pedagogues on deck. A response to "There is no culturally responsive teaching spoken here: A critical race perspective". *Democracy and Education*, 20(2), Article 16. Retrieved from: <http://democracyeducationjournal.org/home/vol20/iss2/16>
- Jett, C. C. (2011). "I once was lost, but now am found": The mathematics journey of an African American male mathematics doctoral student. *Journal of Black Studies*, 42(7), 1125-1147.
- Jett, C. C. (2010). "Many are called, but few are chosen": The role of spirituality and religion in the educational outcomes of "chosen" African American male mathematics majors. *Journal of Negro Education*, 79(3), 324-334.
- Jett, C. C. (2009). Mathematics, an empowering tool for liberation?: A review of mathematics teaching, learning, and liberation in the lives of Black children. *Journal of Urban Mathematics Education*, 2(2), 66-71.
- Ladson-Billings, G. (2009). *The dreamkeepers: Successful teachers of African American children* (2nd ed.). San Francisco, CA: Jossey-Bass.
- Ladson-Billings, G. (1997). It doesn't add up: African American students' mathematics achievement. *Journal for Research in Mathematics Education*, 28(6), 697-708.
- Le, E., Menkart, D., & Okazawa-Rey, M. (Eds.). (2008). *Beyond heroes and holidays: A practical guide to K-12 anti-racist, multicultural education and staff development*. Washington, DC: Teaching for Change.
- Lemons-Smith, S. (2013). Tapping into the intellectual capital of Black children in mathematics: Examining the practices of pre-service elementary teachers. In J. Leonard and D. B. Martin (Eds.), *The brilliance of Black children in mathematics Beyond the numbers and toward new discourse* (pp. 323-339). Charlotte, NC: Information Age Publishing.
- Leonard, J. (2008). *Culturally specific pedagogy in the mathematics classroom: Strategies for teachers and students*. New York, NY: Routledge.
- Leonard, J., & Martin, D. B. (Eds.). (2013). *The brilliance of Black children in mathematics: Beyond the numbers and toward new discourse*. Charlotte, NC: Information Age Publishers, Inc.
- Lichtman, W. (2008). *Do the math #1: Secrets, lies, and algebra*. New York, NY: Greenwillow Books.

- Martin, D. B. (2009a). Researching race in mathematics education. *Teachers College Record*, 111(2), 295–338.
- Martin, D. B. (Ed.). (2009b). *Mathematics teaching, learning, and liberation in the lives of Black children*. New York, NY: Routledge.
- Matthews, L. E., Jones, S. M., & Parker, Y. A. (2013). Advancing a framework for culturally relevant, cognitively demanding mathematics tasks. In J. Leonard & D. B. Martin (Eds.) *The brilliance of Black children in mathematics: Beyond the numbers and toward new discourse* (pp. 123-150). Charlotte, NC: Information Age Publishing.
- McGee, E. O., & Martin, D. B. (2011). “You would not believe what I have to go through to prove my intellectual value!”: Stereotype management among academically successful Black mathematics and engineering students. *American Education Research Journal*, 48(6), 1347–1389.
- Moody, V. R. (2000). African American students’ success with school mathematics. In M. E. Strutchens, M. L. Johnson, & W. F. Tate (Eds.), *Changing the faces of mathematics: Perspectives on African Americans* (pp. 51-60). Reston, VA: National Council of Teachers of Mathematics.
- Nieto, S. (2010). *The light in their eyes: Creating multicultural learning communities* (10th ed.). New York, NY: Teachers College Press.
- Seymour, E., & Hewitt, N. M. (1997). *Talking about leaving: Why undergraduates leave the sciences*. Boulder, CO: Westview Press.
- Sleeter, C. E. (2001). Preparing teachers for culturally diverse schools: Research and the overwhelming presence of Whiteness. *Journal of Teacher Education*, 52(2), 94-106.
- Stinson, D. W. (2010). Negotiating the “White male math myth”: African American male students and success in school mathematics. *Journal for Research in Mathematics*, 41. Retrieved from [http://www.nctm.org/uploadedFiles/Journals_and_Books/JRME/articles/JRME_Special_Equity_Issue/JRME equity Stinson to Pam and DB.pdf](http://www.nctm.org/uploadedFiles/Journals_and_Books/JRME/articles/JRME_Special_Equity_Issue/JRME%20equity%20Stinson%20to%20Pam%20and%20DB.pdf)
- Stinson, D. W., Jett, C. C., & Williams, B. A. (2013). Counterstories from mathematically successfully African American male students: Implications for mathematics teachers and teacher education. In J. Leonard and D. B. Martin (Eds.), *The brilliance of Black children in mathematics Beyond the numbers and toward new discourse* (pp. 221-245). Charlotte, NC: Information Age Publishing.
- Thompson, L. R., & Lewis, B. F. (2005). Shooting for the stars: A case study of the mathematics achievement and career attainment of an African American male high school student. *The High School Journal*, 88(4), 6-18.
- U. S. Department of Education. (2013). Institute of Education Sciences, National Center for Education Statistics. Retrieved from <http://nces.ed.gov/annuals/>
- Valenzuela, A. (1999). *Subtractive schooling: U.S.-Mexican youth and the politics of caring*. Albany, NY: State University of New York.
- Williams, S. (1997). Mathematicians of the African Diaspora: A modern history of Blacks in mathematics. Retrieved from <http://www.math.buffalo.edu/mad/madhist.html>