

K-16 and Beyond: African American Male Student Engagement in STEM Disciplines

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In the Foreword of Carol D. Lee's (2007) book *Culture, Literacy, and Learning: Taking Bloom in the Midst of the Whirlwind*, Linda Darling-Hammond writes: "[This book] names, vividly and with a resonant truth, how it is that the intelligence we know resides in African American youth—indeed, in all youth—gets missed, and how it can be uncovered and cultivated" (p. xvii). Building on the ideals expressed in this quote, this special issue of *The Journal of African American Males in Education* (JAAME) explores the intelligent "everyday" practices that African American male students from elementary through doctoral study bring to the classroom and how these relate generatively to learning and thinking in STEM, specifically in science and mathematics.

In school, only a very narrow repertoire of meaning-making practices is typically valued, a repertoire that leaves out intellectually powerful forms of argumentation, explanation, narration, representation, and imagination across linguistic, visual, bodily, emotive, and symbolic modes of communication. As a result, the everyday funds of knowledge and meaning-making practices that students from historically non-dominant communities bring to their school learning are often missed or dismissed, i.e., interpreted as having no real intellectual value in the classroom. For this reason, the scholarly contributions included in this special issue of JAAME focus on elaborations of the community-based meaning-making practices – ways of seeing, knowing, talking, acting, imagining, valuing, representing -- that African American students K-16 and beyond use routinely in navigating everyday life out of school and how these relate to learning and achievement in mathematics and science.

The intellectual merit in focusing on the everyday practices of the "intelligence we know resides in African American students PreK-16 and beyond" is an opportunity to counter the story which often dominates in STEM, which emphasizes the lack of preparedness and absence of African American students in the STEM pipeline, (i.e., who are being prepared to graduate from high school with sufficient preparation to pursue STEM college majors and careers). Moreover, bringing together scholarship that focuses on the science and mathematics learning of African American male students K-16 and beyond will provide a much needed, more comprehensive view of their "everyday" meaning-making practices and the generative intersections between

these and science and mathematics learning and thinking. The articles that comprise this special issue of JAAME highlight the value that “everyday” funds of knowledge can play in achievement in science and mathematics, and therefore how they can help to counter the hegemonic view and/or treatment of “everyday” funds of knowledge “as errors that impede learning” rather than “as generative resources in learning new ideas and traditions of inquiry” (Warren, Ogonowski, and Pothier, 2005, p. 121).

The “multiple dimensions of learning, including cognition, discourse, affect, motivation, and identity” (Nasir, Rosebery, Warren & Lee, 2006, p. 490) that African American male students K-16 and beyond bring to the science and mathematics classroom supports the cultural view of learning described by Lee (2007) and Nasir et al. (2006) that elaborates the adaptive expertise that students from nondominant groups, in this case African American male students, bring to learning.

Additionally, the articles that comprise this special issue of JAAME offer an expanded view of science and mathematical learning among African American students, K-16 and beyond. This expansion highlights “everyday” practices of African American students that the authors of this special issue believe will challenge teachers and teacher educators “in ways that do not trivialize the connections between everyday knowledge and school-based knowledge, [that] requires both developing a deep understanding of the subject matter and a capacity to overcome deficit assumptions about the nature of these everyday practices and about the students themselves. [It means] de-constructing colonizing mentalities and ethnocentric assumptions that create what Edmund Gordon has called ‘communicentric bias’ which limits understanding of areas of study as well as of those who are taught” (Darling-Hammond, as cited in Lee, 2007, p. xx).

The broader impacts of this special issue lie in the clarity of understanding with regard to engagement of the science and mathematical thinking of African American males. For example, while many programs in STEM have sought viable solutions to the problems associated with student achievement gaps, particularly among students of color, this issue uncovers solutions in the “everyday” practices of the target population, a group and their practices rarely viewed as “models that can be replicated in the public sector” (Lubienski & Lubienski, 2006, p. 651).

This special issue of JAAME provides concrete empirical data that identify and support robust factors that lead to academic achievement, particularly for African American male students in science and mathematics. Moreover, programmatic initiatives, policies, and procedures can be developed and subsequently implemented using these “everyday” practices as a framework. This special issue has the potential to be cited in STEM education and minority education related journals and conferences nationally and internationally. Further, by noticing, naming and engaging with the “intelligence we know resides in African American” [male] students K-12 and beyond, it will provide encouragement toward increasing the quantity and quality of students who graduate from high school with a strong foundation in science and mathematics and who then go on to pursue post-secondary education in STEM and later careers as is the case in the article in this special issue by McGee and Martin titled, *From the hood to being Hooded: A Case Study of a Black Male PhD*.

This special issue of JAAME is divided into two sections. Section I focuses on mathematics and Section II focuses on science. In the lead article in this Special Issue, Robert Q. Berry, III, Kateri Thunder and Oren L. McClain explore the mathematical and racial identities of African American middle school boys who are successful with school mathematics in their article titled, *Counter Narratives: Examining the Mathematical and Racial Identities of Black*

Boys who are Successful with School Mathematics. Na'ilah Suad Nasir and Niral Shah, continue the discussion on narratives in their article titled, *On Defense: African American Males Making Sense of Racialized Narratives in Mathematics Education*. Together, these two articles contribute to an important understanding of how African American males not only make sense of their social and academic lives, but also how factors of school mathematics intersect in their personal lives to produce positive academic outcomes.

Section I ends with Ebony O. McGee and Danny Bernard Martin's article titled, *From the Hood to Being Hooded: A Case Study of a Black Male PhD*, whose counter narrative answers the question, *What does it mean to be a Black male in the context of mathematics learning and participation?* Rob's narrative the subject of the case study highlights the importance of family, neighborhood, and early schooling in sparking an interest in mathematics that was nurtured until college "ushered in a jarring and unexpected period of self-doubt" (p. 18). Despite what could have been a postponement of his aspirations to earn a degree in math, he manages to preserve to achieve academic success in mathematics by subsequently earning a Ph.D. in mathematics. His high academic achievement in math as evidenced from his narrative was not achieved at the expense of a healthy racial-ethnic identity (Wright, in press).

The articles in Section II focus on investigating and documenting the intellectual resources that African American males bring to science education. The section begins with Christopher Emdin's article titled, *Dropin' Science and Dropping Science: African American Males and Urban Science Education*. This article explores everyday practices that African American males take up, modify, challenge and negotiate in urban science classrooms. Emdin also provides insights into how student and teacher practices become rituals, and how rituals develop into approaches to teaching and learning in urban science classrooms.

Seeing as Sound Travels Everywhere: African American Boys Learning to "see" Sound Transmission through the Analysis of Invented Representation, Christopher G. Wright explores and documents the meta-representational competence of a group of middle school African American boys as they explore the scientific phenomenon of sound transmission. The intellectually powerful forms of argumentation, explanation, narration, representation, and imagination taken up by these boys is yet another convincing case for valuing everyday practices that African American students K-12 bring to their engagement in STEM learning (Wright, in press).

The article by Beth Warren and Ann Rosebery titled, *Navigating Interculturality: African American Male Students and the Science Classroom* provides a compelling case for the valuing of everyday practices taken up by African American boys in moment-to-moment interactions in the science classroom. They describe the work of teachers in a teacher development seminar to consider the situatedness of their attitudes, beliefs and pedagogical practices and how these intersect with factors of race, class and gender in their social and intellectual interactions with students from historically marginalized groups, in this case, African American males.

The final entry is a comprehensive summary from an NSF sponsored colloquy on minority males in STEM. This colloquy was designed to promote intellectual synergy among researchers operating in different areas of STEM. The goal of this colloquy was to frame a research agenda with respect to underrepresented minority males to include but not limited to African Americans, Hispanic Americans, and Native Americans.

The articles in this Special Issue, which cover a broad range of student ages, theoretical stances, research methods, and epistemological orientations, all seek to contribute to a greater understanding of African American males K-16 and beyond. Each in its own way takes up the

charge put forth by Shaun R. Harper (2010) in his article, *In His Name: Rigor and Relevance in Research on African American Males in Education*. It is expressed in this article:

that researchers who endeavor to improve African American male success in education should commit at least a fraction of their intellectual efforts to studying those within the race who have earned good grades, avoided trouble and school suspension, assumed leadership positions on their campuses, responded productively to racist stereotypes, resolved masculine identity conflicts, amassed social capital they previously lacked, and negotiated same-race peer support for their school achievement (p. 2).

We hope that this Special Issue of *The Journal of African American Males in Education* will inform educational practice and policy, and provide points of departure for continuing conversations about the intellectual strengths that African American males bring to their education and schooling. The latter is critical because not only do we not have a good understanding of the strengths of this population, we also lack a sense of the variation of these strengths that reside in African American boys and males K-12 and beyond.

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