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The AERA SIG: ULTR provides opportunities for its members to publish <u>scholarly articles and book reviews</u> in the peer-reviewed *Journal of Urban Learning, Teaching, and Research* (JULTR), indexed by ERIC. We strongly encourage our members to take this professional opportunity and share your knowledge about urban education with more than 500 members across the United States and the world. Please carefully review the submission guidelines and selection criteria before you submit your article or book review. All manuscripts are blind-reviewed. **Note: Every author and co-author must be a current and an active AERA and ULTR SIG member at the time of manuscript submission. Only articles by current ULTR SIG members will be reviewed.**

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1. Content of manuscript is related to current literature and urban learning, teaching, and/or research issues.
2. Content of manuscript is of high interest to professors, administrators, researchers, teachers, and other practitioners in urban learning, teaching, and/or research.
3. Content of manuscript is current and/or innovative and adds to the body of knowledge about urban learning, teaching, and/or research.
4. Manuscript is well written (organized, clear in purpose, and free of grammar, punctuation, and spelling errors).
5. (For article submissions): Manuscript adheres to APA standards and includes all necessary elements: (a) Title and Abstract, (b) Introduction, (c) Conceptual Framework, (d) Methods, (e) Results, (f) Discussion, (g) Implications and Conclusion, and (h) Citations and References.
6. Manuscript is free of biases/stereotypes.
7. Manuscript has correct calculations, figures, graphs, and/or tables.
8. Manuscript is of the recommended length.

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Introduction to the 2017 Issue

Alyssa Hadley Dunn
Michigan State University
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The centuries-old ideal of providing a free and universal public education, ultimately and painstakingly, for all children, has been under intense scrutiny and attack for several decades. To borrow from U. S. national-security nomenclature, the threat to the Constitutionally-silent American institution of public schools is at its highest level, and urban public schools have become the most visible and vulnerable targets. This past year, in particular, has raised many questions for those committed to urban learning, teaching, and research. What does it mean to work for justice in urban schools in a time when budgets are being decimated, teachers continue to be maligned and blamed for school "failure," and the rhetoric of "grit" and "resilience" in urban schools pushes students of color and students living in poverty further to the margins of their own futures? What does it mean to teach in a public education system overseen by a President and Secretary of Education who remain staunchly committed to the destruction of that very system and jeopardizing the people in it? As scholars, teachers, teacher educators, and practitioners, how do we situate ourselves in this space so that we may produce scholarship grounded in the community knowledge we know to be of most value in developing initiatives to support and sustain urban youth and their teachers?

The authors and reviewers featured in this journal issue have responded thoughtfully and eloquently to these concerns and questions. Looking across the articles, we find they highlight some of the most enduring and pressing issues facing urban schools today. For example, multiple authors highlight the **centrality of race** in structuring schooling opportunities for urban youth (Adams et al., Boston & Warren, Desai & Abeita, Flennaugh, Martin & Smith, Stewart & Finnigan, Young et al., and Zhu's book review). Several scholars offer the example of the **school-to-prison pipeline**— experienced in various ways by Black boys and girls—as a clear example of endemic racism in urban spaces (Desai & Abeita, Martin & Smith, Kemp-Graham's book review). Authors also pointedly discuss the importance of understanding, evaluating, and supporting **urban teachers' beliefs and practices** (Cramer et al., Flennaugh, Meyer, Robinson & Lewis, Seals et al., Ukpokodu, Adjapong's book review, & Zhu's book review). One way to nurture urban educators' pedagogy is through **in-service teacher support and development**, as articulated in several pieces (McGee & Nutakki, Meister et al., Seals et al., Ukpokodu). In particular, the authors in this volume describe a need to support educators in their work on **STEM-related initiatives** (Adams et al., McGee & Nutakki, Meyer, Seals et al., Young et al.). Since one of the pieces in this very issue (Meister et al.) points out that there is little attention paid to STEM for social justice in practitioner-oriented journals, we are particularly heartened to see so many scholars writing about the intersections of race, gender, equity, and STEM fields. Finally, multiple scholars in this volume address historic and contemporary **urban**

education reforms and policies and the implications of such policymaking on communities, students, and teachers (Cramer & Gallo, Stewart & Finnigan, & Jennings' book review).

We found these intersections among authors' frameworks, questions, and implications to be exciting and hopeful. Taken together, they can point us clearly to the promises and possibilities for liberation in urban education spaces, as well as lead us in new directions toward more justice- and equity-focused practices, policies, and research. The overlaps between these pieces also suggest the possibility of using groups of articles in future courses or future research, and we look forward to hearing from authors and readers about the ways you might take up and build upon the work published here.

It was an honor to work with the editorial team and the authors whose hard work and dedication went into producing the 2017 issue. The Editorial Review Board provided timely, detailed, and supportive feedback for our authors, and our doctoral editorial assistants aided in the editorial and communication process. It is with deep gratitude that we thank Nefertari, Tamara, and Jihea for their support.

(Note: This issue follows the guidelines of the 6th edition of *The Publication Manual of the American Psychological Association* except where authors have preferred otherwise.)

Section 1:
Research Articles

Fueling the STEMM Pipeline: How Historically Black Colleges and Universities Improve the Presence of African American Scholars in STEMM

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ABSTRACT: The purpose of this article is to assess areas of opportunity and access for students of color to participate in the science, technology, engineering, mathematics, and medicine pipeline (STEMM). Using a Critical Race Theory framework, this position paper reviews occupational outcomes and stratification in STEMM fields, examines the pertinence of mathematics as an access point for STEMM entry, and addresses the prominent role that Historically Black Colleges and Universities (HBCUs) play in creating and nurturing STEMM scholars. Throughout the article, emphasis is placed on urban districts, which are often burdened by limited resources while serving the largest number of students of color. The article concludes with suggested recommendations for improving the diverse representation in STEMM fields.

Keywords: STEMM, HBCUs, Critical Race Theory, stratification

As the nation seeks to maintain its positioning as a global superpower, it seems contingent upon developing competent citizens in the fields of science, technology, engineering, math, and medicine (STEMM). STEMM is an elaboration of STEM to include medicine, as many science degrees culminate into careers in the medical field. The focus on STEMM education seeks to ensure that the nation's citizens are prepared to live and compete in an evolving global marketplace (National Science Board, 2007). In addition, Miller and Kimmel (2012) argue that the U.S. standard of living is at stake if efforts are not taken to ensure competency and competitiveness in the sciences.

Given the national focus to increase access and equity in STEMM, the purpose of this article is to assess areas of opportunity for students of color to participate in the STEMM pipeline. The observation that urban school districts, which have a higher population of Black and Latino students who are trailing behind White and Asian Students in mathematics as early as the fourth grade, indicates an opportunity to examine the STEMM teaching and learning practices in urban education (U.S. Department of Education, 2009, 2011, 2015). Using a Critical Race Theory framework, this position paper discusses occupational outcomes and stratification in STEMM fields, the pertinence of mathematics as an access point for STEMM, and the prominent role that Historically Black Colleges and Universities (HBCUs) play in creating

STEMM scholars. The article concludes with suggested recommendations to aid improving the diverse representation in STEMM fields.

Theoretical Framework

The examination of the STEMM pipeline in this study is grounded in Critical Race Theory. Critical Race Theory (CRT) is an extension of critical theory which examines the role of structures of society as dominating, or *hegemonic*, tools to maintain the power of dominant groups over subordinate groups (Bennett-deMarrias & LeCompte, 1998). Conceptually articulated through Derrick Bell in the 1960s, CRT, as explained by Ladson-Billings (1998), strategically frames the centrality of race in U.S. social systems and the need to provide agency and voice through the stories of the oppressed and marginalized (Delgado & Stefancic, 2007). From an educational perspective, CRT examines inequity in schools, viewing them as societal structures that replicate the patterns of institutional racism (Jackson, 2016).

In doing so, CRT has core principles identified by various scholars and their seminal works which highlights the applicability of CRT to the field of education. First and foremost, CRT recognizes the construction of race and the system of racism as incessant in society and thus can be linked to inequities in schools (Ladson-Billings & Tate, 1995; Ladson-Billings, 1998; Solorzano & Yosso, 2001). From this, dominant and liberal discourses such as colorblindness must be challenged as they also maintain systems of power of privilege (Ladson-Billings & Tate, 1995; Ladson-Billings, 1998; Solorzano & Yosso, 2001). The ideology of colorblindness, or colorblind racism, is defined as explaining "contemporary racial inequality as the outcome of nonracial dynamics" (Bonilla-Silva, 2006, p.2). Essentially, colorblindness recognizes the status of inequity among people of color can be understood through alternative explanations not attributed their race and the larger impact of racism (Bonilla-Silva, 2015). The third tenet of CRT calls for strong attention to social justice with the goal of eliminating inequity (Solorzano & Yosso, 2001). Counter-storytelling is used as a tool for sharing of experiences and knowledge through first-person accounts (Ladson-Billings, 1998; Solorzano & Yosso, 2001). Counter-storytelling provides different narratives that battle myths held by members of other groups (Delgado & Stefancic, 2007). Such stories help challenge those dominant narratives and promote social justice (Solorzano & Yosso, 2001). Issues of property are addressed within the CRT framework as the nation's history is replete with battles over property rights (Ladson-Billings & Tate, 1995). Originally explicated by Harris (1993), Whiteness has emerged as a form property because of the privileges it affords (Ladson-Billings & Tate, 1995). Lastly, for CRT in education, interest convergence is also taken from critical legal studies and is identifiable when any progress or gains made for students of color of in school occur when there is an alignment with interests of Whites (Ladson-Billings, 1998).

Through the lens of CRT and its core tenets, research on the STEMM pipeline implies an examination of institutional and social forces that maintain power for one group while stifling the social mobility of others. Given the future projections of economic sustainability in STEMM fields, the ability to enter these professions can be key to personal and community social mobility. The exclusion of African Americans from STEMM related fields through the institution of education as a superstructure strips their agency and maintains power for the dominant group in social and economic environments.

Occupational Outcomes and Stratification in STEMM Fields

Continuing efforts to focus on the diversity of STEMM fields is directly related to

STEMM degree completion rates being lower for people of color compared to their peers (Landivar, 2013; Museus & Liverman, 2010). A review of the demographics of the STEMM workforce reveals not only is it dominated by males, but it is also overwhelmingly White (May & Chubin, 2003). Given this racial and gender dominance, much attention is given to the diversity of the STEMM "pipeline" (Strayhorn, 2015). The STEMM pipeline refers to pathways throughout various levels of education which culminate with STEMM employment (Lowell, Salzman, Bernstein & Henderson, 2009). The necessity for a STEMM pipeline concentrating on marginalized groups represents not only an opportunity to satisfy the growth of STEMM-related careers, as suggested through the writings of Anderson and Ward (2013) and Byars-Winston (2014), but also an opportunity to increase the economic and social mobility for STEMM-related professionals (Xu, 2013).

The latter emphasis is crucial, given the need for what Basile and Lopez (2015) describe as a "humanitarian approach" toward creating access to the STEMM pipeline for students of color. Basile and Lopez (2015) provided a thorough review of policy reports regarding students' of color mathematics and science progression. Their research shows students of color are mostly addressed in the literature only to reiterate their under-representation without addressing any underlying causes. Basile and Lopez (2015) note that the majority of literature they reviewed focused only on the need for students of color to be able to participate in STEMM because it would provide economic benefit to the larger society or STEMM enterprises. This is a direct example of interest convergence within the CRT framework since the inclusion of diverse populations simultaneously benefits others. Conversely, Basile & Lopez (2015) found only one report promoting STEMM education because of the benefits it could bring to individuals regarding quality of life. The authors assert the larger STEMM conversations are colorblind to structural and institutional racism and its role in creating the persistent underrepresentation of people of color (Basile & Lopez, 2015; Bonilla-Silva, 2006; 2015).

According to the U.S. Department of Labor's Bureau of Labor and Statistics (2012), of the 20 projected fastest growing professions from 2012 to 2022, 12 professions are STEMM-related. Hrabowski III (2012) explains students of color represent 40% of K-12 schools, but they represent only 18% of STEMM bachelor's graduates and only 5% of STEMM doctoral recipients. Additionally, African Americans and Latino populations are underrepresented by 50% in undergraduate engineering programs (Anderson & Ward, 2013; Hrabowski III, 2012). Integrating these occupational outcome statistics of the Bureau of Labor and Statistics (2012) with the research on the underrepresentation of people of color in STEMM education (Anderson & Ward, 2013; Byars-Winston, 2014; Hrabowski III, 2012), it is clear that people of color are being systematically stratified and disenfranchised from significant earning and mobility opportunities.

Math as a STEMM Gatekeeper

Gatekeeper courses are foundational courses for entry to various subject areas. While the gatekeeper courses for STEMM fields have been collectively identified as calculus, physics, and chemistry (Redmond-Sangogo, Angle, & Davis, 2016), this paper posits that mathematics is a frontrunner in the gatekeeper courses because it is a woven thread of the various fields and because it has been at the forefront of various findings in research. Chiefly, it is designated as a "critical filter" for aspiration for, entry to, and persistence through STEMM related programs and careers (Shapka, Domene & Keating, 2006). Thus, examining student performance in this "critical filter" is necessary.

Early Barriers in Urban STEMM Teaching and Learning

The research of Nadelson et al. (2013) indicates that limited exposure to STEMM preparation among elementary teachers diminishes their perception of STEMM practices and their ability to provide early exposure to students. This lack of preparation and diminished perception of STEMM practices is further problematized when considering cultural mismatch and the impact of teacher perceptions on Black students in urban schools (Ladson-Billings, 2009).

In a study of a district-wide K-2 integrated STEMM curriculum in a large urban school district, Parker, Abel, and Denisova (2015) applied Anderson's (1996) three barriers to curriculum reform. Anderson (1996) identifies: a) *technical barrier*, teacher content and pedagogical knowledge; b) *political barrier*, lack of resources and effort from district; and c) *cultural barrier*, teacher beliefs, values, and perceptions of teaching and learning. Parker et al. (2015) finds that grade-level teams, modeling by coaches with strong STEMM knowledge, structured time to practice and reflect on pedagogy, the creation of a communal learning environment, and quality technology helped participating teachers overcome barriers to implementing integrated STEMM curriculum.

Of those in the Parker et al. (2015) study that did not implement the curriculum, reasons cited were: a) lack of resources, political barriers; and b) lack of time, which could be either cultural or technical. The lack of resources, while political according to Parker et al. (2015), has the potential to impact cultural practices in instruction. Skaza, Crippen, and Carroll (2013) note that even when presented with technology-based instructional models, as much as 81% of instruction is characterized by a high teacher reliance on pencil, paper, and class discussion as pedagogical techniques. The perceived lack of time aligns with studies of teachers in urban schools. Scholarship on urban education identifies teachers are often less qualified (Darling-Hammond, 2010), hold assimilationist views of teaching and learning (Ladson-Billings, 2009), hold harmful perceptions of children (Castro, 2012; Gay, 2009; Ng, 2003), and develop strong insensitivity towards children (Haberman, 2010). The omnipresence of race creates a structural barrier in urban teaching practices that impact students' early math preparation and overall entry to STEMM-related pathways in later grades.

Tracking Students' Math Progress and Preparation

Lowell et al. (2009) have identified the role early exposure plays in ensuring students are well-prepared to enter STEMM fields by the time they are in college. Some research has examined students' participation as early as fifth grade. In a 2012 study conducted by the National Center for Education Statistics, researchers found only 25.8% of Black[1] students in the top half of fifth grade math go on to take Algebra I by eighth grade, as opposed to 60% of White students (Ross et al., 2012). Miller and Kimmel (2012) explained the STEMM pathway begins with algebra placement in middle school and continues throughout high school and college with calculus courses. The time at which students take algebra has been found to be correlated with one's interest to enter STEMM fields. The percentage of students who show interest in the fields is likely to increase if they take Algebra I early while interest declines as students take Algebra I in later grades (Miller & Kimmel, 2012). Additionally, taking Algebra I before high school leads to students being able to participate in rigorous curriculum as they matriculate (National Science Board (NSB), 2016; Nord et al., 2011).

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[1]African American and Black are used synonymously throughout. Both terms are used to define those who are direct descendants of continental Africa. Black is used largely to align with the secondary data mentioned.

Differences in ninth grade math enrollment show more Black students are taking Algebra I, while more Asian and White students are taking geometry (Ross et al., 2012). Of Black and White ninth graders, 9.5% of Black students are more likely to take a remedial math course as opposed to 5.8% of their White counterparts (Ross et al., 2012). These trends continue for advanced placement and other higher level mathematics courses (Ross et al., 2012). In a review of 50 large urban cities, DeArmond, Denice, Gross, Hernandez, and Jochim (2015) found that less than 10% of students are enrolling in advanced math courses in 29 of those cities.

Adelman's (1999) work highlighted the positive influence of mathematics course-taking beyond Algebra 2 on the completion of bachelor's degrees. Similarly, in data analyzed by the National Science Board demonstrates, of all students majoring in STEMM fields, more of them had taken calculus than those that had not gone further than Algebra II (NSB, 2016). Finally, Battey (2013) states, "because mathematics serves as a gatekeeper for entrance into elite colleges and for higher-paying careers, mathematics education is also a system used to stratify society" (p. 340). Battey's (2013) research reviewed differences in mathematics courses by different racial groups to approximate probable future wages. Differentials were organized by racial/ethnic groups and by the highest level of high school math taken. Findings revealed higher level math courses collectively yielded higher earnings for all groups. The secondary data used in this analysis showed Latino, Black, and Native students were less likely to take higher level mathematics courses across their high school years than White and Asian students (Battey, 2013). Through a CRT lens, these patterns can be concluded to be directly linked to the hierarchy that racism as a structure has created.

Access to Mathematics

Understanding the prominent role of mathematics, the aforementioned research conclusions necessitate an analysis of access to higher level math courses. May and Chubin (2003) found a *resource gap* in urban areas where majority of students of color attend school. The Office of Civil Rights (2014) data collection outlined disparities in access to courses needed to ensure college and career readiness. This data revealed a lack of access to crucial math courses (Algebra, Algebra II and Calculus) for schools with large numbers of Black and Latino students. Data showed 89% of high schools offered Algebra, 81% offered Algebra II and 50% offered Calculus. For Algebra II, 74% of the schools with majority Black and Latino students offered the course as compared to 83% of the schools with the lowest number of these students. Only 57% of Black students had access to the full range of courses. This data remains consistent with decades of research literature highlighting unequitable access (Gottfried & Johnson, 2014), the tracking of students of color in lower level courses (Rubin & Noguera, 2004), and a lack of quality advanced placement courses in urban areas (Hallett & Venegas, 2011). In totality, mathematics performance disparities are relative to variations in the opportunity provided for students to learn mathematics (Oakes, 1990).

Mathematics Performance

The most recent National Assessment of Educational Progress (NAEP) results were analyzed to review mathematics achievement for grades 8 and 12. The NAEP results for percentage of students at or above basic and at or above proficient by racial groups is reported below in Tables 1 and 2 for the years 2013 and 2011 (grade 8) and 2009 and 2013 (grade 12).

Table 1: Grade 8 Math Results for 2011 and 2013

Race	2011 At or Above Basic	2011 At or Above Proficient	2013 At or Above Basic	2013 At or Above Proficient

White	84	44	84	45
Black	51	13	52	14
Hispanic	61	20	62	21
Asian/Pacific Islander	86	55	87	60

Note. Data for the National Assessment of Education Progress (2011, 2013).

Table 2: Grade 12 Math Results for 2009 and 2013

Race	2009 At or Above Basic	2009 At or Above Proficient	2013 At or Above Basic	2013 At or Above Proficient
White	75	33	75	33
Black	37	6	38	7
Hispanic	45	11	50	12
Asian/Pacific Islander	84	52	81	47
American Indian/Alaska Native	56	12	54	12
Two or More Races	71	28	67	26

Note. Data for the National Assessment of Education Progress (2009, 2013).

For each year presented here, Black and Latino students are reported to have the lowest levels of proficiency. Furthermore, the National Center of Education Statistics (NCES) reports findings from the Trial Urban District Assessment (TUDA) which extends the NAEP results by focusing solely on large urban districts. Twenty-one urban districts are included in the TUDA analysis, including cities such as Chicago, Los Angeles, Atlanta, and Philadelphia (NCES, 2016). Mathematics results from 2013 show average scores for students in these larger urban districts were lower in both fourth and eighth grade as compared to overall scores for students across the nation (NCES, 2016). While the results of NAEP performance data is valuable in its own right, consistent with a Critical Race Theory analysis, the data alone can be problematic. Primarily, if Whites are to be continuously regarded as the comparison group, it perpetuates discourse about racial intelligence differences (Gutierrez, 2008), and the data alone leaves no room for interpretation of contextual factors impacting academic disparities among the various racial/ethnic groups (Basile & Lopez, 2015).

SAT Mathematics Performance

The National Center for Education Statistics (2016) explains the SAT is used as an instrument to predict how well students will do in college. Additionally, research has shown an association of SAT math scores to STEMM major selection (Davison, Jew, & Davenport,

2014). Davison et al. (2014) found students declaring STEMM majors had higher SAT math scores and those students with higher verbal SAT scores were likely to declare non-STEMM majors. As evident in Table 3, Asian/Pacific Islander and White students report the highest scores while Black and Latino groups report the lowest. However, students of color face a myriad of factors that have been linked to their lack of overall preparation for such tests. A special report by the *Journal of Blacks in Higher Education* (2000) reported the racial gap in standardized testing for college admissions among Black-White students could be attributed to academic tracking, low teacher expectations, and the lack of cultural responsiveness of the tests themselves. Familial background and economic status, as well as contextual factors within schools, have also been said to impact test disparities (Fernandes, McElroy & Myers, 2016). Research also shows that students of color whose academic capabilities are comparable to White students still score lower on the test (Jaschik, 2010). These findings call for deeper analysis of race as a factor in these differences.

Table 3: SAT mean scores of college-bound seniors, by race/ethnicity: Selected years, 2009 through 2013

Race/ethnicity	*2009-10*	*2010-11*	*2011-12*	*2012-13*
White	536	535	536	534
Black	428	427	428	429
Mexican	467	466	465	464
Puerto Rican	452	452	452	453
Other Hispanic	462	462	461	461
Asian/Pacific Islander	591	595	595	597
American Indian/Alaska Native	492	488	489	486
Other	514	517	516	519

Note. SAT data by race from 2009-2013.
SOURCE: Snyder, T.D., and Dillow, S.A. (2015). Digest of Education Statistics 2013 (NCES 2015-011). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

The Historic Role of HBCUs

Historically Black Colleges and Universities have a rich tradition of producing qualified Black scholars. The first HBCUs, Cheyney and Lincoln University in Pennsylvania and Wilberforce in Ohio, were established in the north prior to the Civil War. Additional HBCUs opened during the Reconstruction Era in an effort to educate the thousands of newly freed Blacks in the south who were not allowed to attend White colleges and universities. Early HBCUs were started with the purpose of creating a Black skilled labor force to uplift the Black race (Gasman, 2007). Prior to 1890, many functioned as a primary and secondary schools for Black students. The Morrill Act of 1862 first introduced formal sciences (i.e. agriculture and the mechanical arts)

to the higher education curriculum in the United States (Library of Congress, 2017).

It was the 1890 Second Morrill Act that extended land grant institutions for Black students in states with racially segregated higher education systems, and these institutions were responsible for educating Black farmers, scientists, and teachers. Throughout the remainder of the nineteenth century and the first half of the twentieth century, the 1896 U.S. Supreme Court *Plessy* "separate but equal" decision kept students of color and White students in separate schools, making HBCUs the primary source of higher education for Black students in the United States. Though the 1954 *Brown v. Board of Education* overturned Plessy's de jure segregation, the majority of Black students in the United States still attend HBCUs in greater numbers than non-HBCUs and graduate at a higher frequency (Purnell, n.d.; Office of Civil Rights, 2015).

HBCU Student Outcomes

Historically Black Colleges and Universities have served as institutions of human agency for African Americans. As a result, they are believed to aid in the creation of a new discourse about Blacks in education as well as being large advocates of change. These assumptions provide alignment within the CRT framework which seeks to ensure social change (DeCuir & Dixson, 2004). This change is evident through a review of HBCU graduate outcomes. While HBCUs represent 3% of degree granting institutions, they represent 24% of all African American bachelor's degrees produced (Owens, Shelton, Bloom, & Davis, 2012). Minority serving institutions collectively, which includes HBCUs, award the largest number of degrees to students of color (John & Stage, 2014). Flores and Park (2015) identified North Carolina, Texas, Alabama, Georgia, and Florida as having the largest number of Black undergraduate students and note these same states have a strong HBCU presence (Flores & Park, 2015). Jackson (2002) reports on the success of HBCUs in the creation of African American college graduates including high percentages of Black doctors, political leaders, and Ph.D. recipients. The work of Owens et al. (2012), as shown in Table 4, suggests the small group of institutions produce a large representation of African Americans in STEMM-related career fields.

Table 4: Bachelor's Degrees Awarded to African Americans (2001-2009)

STEMM-Related Field	HBCU Graduates (%)
Biomedical Sciences	48
Computer Science	25
Engineering	46
Mathematics	46
STEM	39

Note. The data presented represents the HBCU percentage of total African American graduates in stem related fields.

SOURCE: Owens, E.W., Shelton, A.J.., Bloom, C.M., & Cavil, J.K. (2012). The significance of HBCUs to the production of STEM graduates: Answering the call. *Educational Foundations, 26*(3/4), 33-47.

Recent research posits HBCUs provide a level of support, academic challenge, and relationships not experienced by African American students at predominantly White institutions (PWIs) (Chen, Ingram, & Davis, 2014; Seymour & Ray, 2015; Toldson, 2013). Research from Toldson (2013) and Seymour and Ray (2015) asserts African American students at HBCUs report a more positive relationship with a caring professor than African American students at PWIs. Similarly, students at HBCUs report a higher level of support, 35% to 12%, and experiential learning opportunities, 13% to 7%, than their African American counterparts at PWIs (Seymour & Ray, 2015).

As postgraduates, HBCUs graduates report a greater sense of preparation for life outside of college, 55% to 29%; a higher level of employee engagement, 39% to 33%; higher sense of Alumni attachment, 39% to 20%; and sense of financial well-being, 40% to 29%; than African American students at PWIs, respectively (Seymour & Ray, 2015). Recent findings from the U.S. Commission on Civil Rights (2010) report argue that, among early career earnings, HBCUs are doing as well as PWIs at producing graduates who are financially successful. The presence of HBCUs have provided a level of agency that has led to increased outcomes for African Americans in post-graduate life.

HBCUs as STEMM Producers

HBCUs play a significant role in funneling students of color into the STEMM pipeline (May & Chubin, 2003; Owens et al., 2012; Suitts, 2003). Though HBCUs do not often receive deserved public recognition (Suitts, 2003) and suffer from a lack of resources (Suitts, 2003; Upton & Tanenbaum, 2014), there is a long history of these institutions aiding the crusade toward diversity in STEMM (Owens et al., 2012). Of the top five producers of Black engineers in 2014, four of the five were HBCUs (Diverse Issues in Higher Education, n.d). The *Diverse Issues* Top 100 datasets include institutions conferring the most degrees to students of color by field. When searching baccalaureate STEMM related-fields (biological & biomedical sciences, engineering, mathematics & statistics, and physical sciences) specifically for African American students, the results show that the majority of the top ten institutions in each of the field are HBCUs. As shown in Table 5, basic frequency counts reveal that, of the top 10 institutions in biological & biomedical sciences, seven are classified as an HBCU; in engineering, six are HBCUs; in mathematics and statistics, seven are HBCUs; and in physical sciences, seven are HBCUs.

Table 5: Top STEM Producers 2015

STEMM Field	Institution
Biological & Biomedical Sciences	Georgia State University
	Jackson State University*
	Howard University*
	Xavier University of Louisiana*

	Florida Agricultural and Mechanical University*
	University of Maryland-College Park
	Spelman College*
	Alcorn State University*
	Hampton University*
	University of Maryland-Baltimore County
Engineering	North Carolina A & T State University*
	Georgia Institute of Technology-Main Campus
	Prairie View A & M University*
	Morgan State University*
	North Carolina State University at Raleigh
	University of Florida
	University of Maryland-College Park
	Howard University*
	Tuskegee University*
	Alabama A & M University*
Mathematics & Statistics	Fort Valley State University*
	North Carolina A & T State University*
	Spelman College*
	Howard University*
	Morehouse College*
	University of Maryland-Baltimore County
	The University of Texas at Austin
	Georgia State University
	Savannah State University*
	Alabama State University*
Physical Sciences	Xavier University of Louisiana*
	Jackson State University*
	Georgia State University
	Morehouse College*
	Howard University*
	Virginia Commonwealth University
	Alabama State University*
	Texas Southern University*
	North Carolina A & T State University*
	CUNY Graduate School and University Center

Note. The data presented lists STEMM categories and corresponding institution with the highest degrees conferred in those fields.
*Indicates designation as a Historically Black College or University (HBCU).

Recommendations

Taking the data presented in this article into consideration, three specific

recommendations are suggested for pathways that could increase the number of African American scholars in STEMM: (a) focus on mathematics interventions across middle and high school; (b) increase funding for HBCU programs; and (c) create, support, or develop targeted STEMM academic enrichment programs for underrepresented groups.

Since gatekeeper mathematics courses have been found to be a predictor of college and career success (Battey, 2013; Redmond-Sangogo et al., 2016), interventions are necessary to help propel students in upper level math courses as they matriculate into high school and college. It is recommended that early intervention be utilized as early as fifth grade. In the case study of Lincoln Charter School presented by Paul and Vaidya (2014), their school was able to increase mathematics proficiency across the school as a result of a formally structured math program, supplemental curriculum materials, and online gaming. It is recommended that more urban school districts create formal programs throughout the school day targeted at math proficiency using Lincoln Charter as one plausible example.

Given that the SAT still serves as a gateway to college and access to the STEMM pipeline, students of color could benefit from SAT preparation courses for testing strategies. In their meta-analysis, Montgomery and Lilly (2011) determined coaching for the SAT leads to overall increased performance as compared to non-coached peers. Understanding differences in access to resources, we extend Montgomery and Lilly's (2011) recommendation of trying to seek out low-cost resources, such as online and text materials, by encouraging schools to supplement math curriculum with SAT preparation materials during class time for enrichment, giving all students some exposure. Students could also solicit additional coaching if SAT preparation courses were provided as elective options. Lastly, allowing school-wide access to the preliminary SAT (PSAT) could help students understand the test format and practice learned test taking strategies. Collectively, one way to address math interventions would be to create formal school wide initiatives and scheduling enrichment and remediation time during the school day during advisory or study hall periods. Above all, the gap in resources and access as highlighted by the Office of Civil Rights (2014) also pose a threat to students from urban districts successfully entering the STEMM pipeline. Until concerted efforts are made on the part of school leaders and government officials to close such gaps and thus STEMM proficiency, inequities in access to courses and qualified teachers for those courses may remain.

HBCUs are highly positioned to increase the number of student in the STEMM pipeline through support and P-12 interventions. According to Roach (2015), HBCUs have a long history of providing best practices that are aligned with STEMM success, including faculty and peer mentoring, summer bridge programs, supplemental instruction, and research with faculty. However, funding is required to support the institution and program costs not covered by tuition and state funding. Such costs include those associated with maintaining facilities, faculty, and sophisticated equipment associated with providing a top tier STEMM programs. Alumni giving is one vital component of institutional support that can be used for scholarships, new laboratories, and faculty endowments. Using alumni giving campaigns and private funding from foundations, such as Bill & Melinda Gates, Kellogg, and Ford may also help offset costs associated with implementation of early support and intervention programs for underrepresented P-12 students.

While there are many national programs designed to serve underrepresented populations in efforts to increase college readiness, such as Upward Bound and GEAR UP, it is encouraged that HBCU STEMM program leaders design and establish school-based programs in their surrounding communities and summer camps with a STEMM focus on their campus site. While

many summer programs are reserved for academically talented students, such as The Summer Ventures in Science and Mathematics out of North Carolina, we recommend HBCUs to position themselves to focus on those students needing more remediation. With HBCUs being located within the same largest urban school districts and communities including Atlanta, Charlotte, Washington, D.C., Raleigh, and Houston to name a few, HBCUs could serve their local communities by offering opportunities for extended math tutoring, STEMM exposure, collegiate and career mentoring, and other enriching collegiate experiences for P-12 students. Highlighted by Le, Mariano, and Faxon-Mills (2016), the College Bound program of St. Louis developed a tiered program offering students up to nine years of continuous support. HBCU leaders can look to these unique programs to design their own. Programs are encouraged to employ culturally responsive pedagogy and curricula in efforts to allow students to begin to see their personal and historical connections to mathematics, all while increasing what Akbar (1999) coins a "legacy of competence." Such programs could prove to be fruitful recruitment tools for the campuses. Lastly, since approximately one third of students are required to take remedial courses (Attewell, Lavin, Domina, & Levey, 2006), unique summer bridge programs at HBCUs could provide intensive instruction for students in remedial mathematics courses while tracking and promoting their continuation to advanced mathematics.

Our recommendations for extending this present conversation include the need for research to give voice to students of color by focusing their experiences. This would provide the "counter-storytelling" crucial in Critical Race Theory. Suggestions include capturing the mathematical experiences of urban students in school which could provide a glimpse of the role of various schooling contexts and their motivation for choosing STEMM pursuits. Such works seeking to do this already include Stinson (2008), Oppland-Cordell and Martin (2015), and Berry, Thunder, and McClain (2011), among others. All of these have worked to capture counterstories of students of color and their success across the P-16 pipeline collectively. More of this research is needed because, as explained by DeCuir and Dixson (2004), "research conducted through CRT analysis will allow for the deprivileging of mainstream discourses while simultaneously affording the voices, stories, and experiences" (p. 30). In addition to utilizing CRT as a lens for analysis, we encourage urban education researchers to also consider employing Brown-Jeffy and Cooper's (2011) five principles of culturally relevant pedagogy as a framework to deepen our understanding of relationships, identity, and academic excellence among urban students. As supported by the data, mainstream discourse has gendered and racialized mathematics achievement and disparities. Furthermore, when courses are not available in one school but available in another, it sends the message that those subjects are designed for specific groups thus excluding others. Ladson-Billings and Tate (1995) identified curriculum as intellectual property and connect access to curriculum to the CRT tenet of Whiteness as property. More specifically in education, Whiteness as property becomes evident through differences in access and funding (DeCuir & Dixson, 2004).

Conclusion

In conclusion, based on the national push toward the STEMM fields, students of color cannot be relegated to the margins. Opportunities must be provided for them to be given a fair and deliberate opportunity to not only succeed in these areas, but to be included and exposed to the pipeline. Using a CRT framework, this position paper discussed why ensuring the presence of students of color is necessary given outcomes and stratification in STEMM fields, the role mathematics plays as an access point, and the prominent role Historically Black Colleges and

Universities play in creating needed STEMM scholars. As a review, the conceptual framework provided here calls for a CRT analysis as all of the disparities found share the common thread of dramatic differences for students of color. Racism is engrained in society and highlighting its permanence is a basic tenet of CRT (DeCuir & Dixson, 2004). While the data utilized here is not likely to be surprising, it continues to trend along centuries of exclusionary practices based merely on race. Where education is supposed to be "the great equalizer," the structure of school itself is guilty of using exclusionary practices and, as a result, the continued stratification of society occurs. Without specific attention to the preparation, performance, and pathway access to STEMM for students of color, as well as attention to the strength of HBCUs, the journey towards equity and social justice may remain stagnant. As a final note, in agreeance with Battey (2013),

> future research on achievement differences should not be published without also noting mechanisms that contributed to those differences. The goal of these efforts is to break the symbolic racism as to who is mathematically able and therefore teachable. By taking this perspective, hopefully educators can continue to work toward racial justice in mathematics education. (p. 354)

We extend this position to include science, technology, engineering, mathematics, and medicine education collectively.

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The Effects of Belonging and Racial Identity on Urban African American High School Students' Achievement

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ABSTRACT: A growing body of literature suggests students' feelings of belongingness influence academic achievement (Faircloth & Hamm, 2005). Additionally, research indicates that many urban African American students are disconnected from the school setting because of a cultural divide between students and educators (Thompson, 2004). This investigation examined the relationship between the individual components of racial identity (centrality, private regard, and public regard) and sense of belonging on the academic achievement of 105 urban African American high school students. Quantitative analysis using items from the Multidimensional Model of Black Identity-teen and California Healthy Kids surveys, as well as participants' self-reported grades, reveals (a) centrality as the only predictor of sense of belonging, and (b) a positive relationship between sense of belonging and grades. These findings suggest the importance of schools cultivating a culture of acceptance of all racial groups and positive teacher-student relationships.

Keywords: racial identity, sense of belonging, African American, high school, academic achievement

A growing body of literature suggests students' feelings of belongingness influence academic achievement (Faircloth & Hamm, 2005). The need to belong encompasses students' feeling about themselves, as well as their relationships with others in the educational setting (Booker, 2016). Sense of belonging has been linked to positive academic outcomes for all students, but it is particularly significant for students from socially stigmatized groups, such as urban African Americans, who have historically experienced discrimination in educational institutions (Murphy and Zirkle, 2016; Purdie-Vaughns, Steele, Davies, Ditlmann, & Crosby, 2008). Despite these findings, there is a lack of understanding of the role of belonging and its impact on the academic achievement of diverse students (Faircloth & Hamm, 2005).

High school social structures can affect students' sense of belonging to the extent that they perpetuate racial stereotypes and social exclusion or promote inclusiveness (Booker 2006; Rosenbloom, & Way, 2004). For example, in predominantly African American communities, it is likely that the majority of the teachers are of a different ethnicity with limited teacher-training on serving diverse populations (Epstein, 2005). Teachers' lack of understanding of the unique needs of urban African American students can lead to students feeling disconnected from the school setting (Ford & Harris, 1996). Furthermore, students' racial identity can influence their feelings of belongingness and achievement at school (Byrd & Chavous, 2011). Thus, the authors argue that it is imperative to understand the relationship among students' race, sense of belonging within the context of the school setting, and academic achievement.

Literature Review

Sense of belonging, particularly within the context of a school setting, has been examined in relation to students' educational outcomes for decades. Generally, sense of belonging signifies the feeling of relatedness or connection to others (Goodenow, 1993). While varying definitions of sense of belonging exist, most researchers maintain that sense of belonging is the "extent to which students feel personally accepted, respected, included, and supported by others-especially teachers and other adults in the school social environment" (Goodenow & Grady, 1993, p. 80). Research shows that students who report high levels of sense of belonging to the school environment experience positive educational outcomes (Johnson, 2009). For example, high sense of belonging to school has been positively associated with high academic achievement, high school graduation rates, and school satisfaction (Uwah, McMahon, & Furlow, 2008). In contrast, lack of sense of belonging has been associated with depression, anxiety, alienation, and loneliness. Consequently, these negative feelings can lead to decreased academic motivation, engagement, and academic achievement among students (Booker, 2007).

Much of the long-standing empirical research on sense of belonging describes it as a universal construct having the same significance and influence on educational experiences for all racial groups of students. Research has emerged, however, indicating that belongingness has a different meaning for urban African American students whose racial group is associated with negative racial stereotypes (Purdie et al., 2008). Settings alone have the power to signal the degree of threat or safety an individual will experience (Goodenow & Grady, 1993). Members of marginalized groups often question their value in mainstream settings, especially in settings in which they have historically experienced discrimination. Consequently, high school, in particular, may present unique challenges for African American students (Purdie-Vaughns et al., 2008).

The conceptual framework for the current study draws upon racial identity theory (Sellers, Smith, Shelton, Rowley, & Chavous, 1998). Racial identity theory provides an understanding of the significance and meaning that individuals attach to their group membership (Sellers et al., 1998). Researchers have suggested that the three components of racial identity (i.e., centrality, private regard, and public regard) do not function independently; rather, these variables interact to influence attitudes and behaviors (Byrd & Chavous, 2011).

Racial *centrality* refers to the dominance of an individual's race to his perception of self-concept. Since centrality is stable across situations, it is measured by an individual's perception of self with respect to race across various situations. Regard, which entails an individual's affective or evaluative judgment of race, consists of two subscales: public and private. *Public regard* refers to one's perception of how others view African Americans, whereas *private regard* refers to one's positive or negative feelings about African Americans, as well as how one feels about being an African American (Sellers et al., 1998). The two prevalent frameworks used to explain racial identity in relation to African American students' educational achievement are the racial-identity-as-promotive perspective and the racial identity-as-risk perspective (Smalls, White, Chavous, & Sellers, 2007).

The racial-identity-as-promotive perspective holds there are benefits to possessing high centrality and high private regard. In essence, high centrality and private regard act as buffers to the negative experiences related to race within the school context. For example, research has shown positive associations between high centrality and high private regard with the value of education, academic aspirations, high school and college attendance, and academic achievement (Chavous, Bernat, Schmeelk, Cladwell, Kohn-Wood, & Zimmerman, 2003; Harper & Tuckman,

2006). Smalls et al. (2007) found that school settings that are congruent with and supportive of students' racial identity greatly contribute to students feeling a strong connection to school. Yet, the role of racial centrality varies across situations. Feeling connected to a group through membership may make some African Americans resilient when faced with discrimination while others may feel vulnerable when faced with negative racial stereotypes (Okeke, Howard, Kurtz-Costes, & Rowley, 2009; Wong, Eccles, & Sameroff, 2003).

The racial identity-as-risk perspective, on the other hand, acknowledges that there are risks involved when urban African American students strongly identify with their racial group because of its history of being stigmatized (Byrd & Chavous, 2011). The heightened awareness of the group's stigmatized status presents a risk to the self-esteem in domains such as school, where the group may have historically experienced discrimination (Booker, 2006; McGhee, 2003; Steele, 1997). Steele (1997) suggested individuals in marginalized racial groups may choose to dis-identify with the group or the domain as a means of self-protection. This perspective holds that in academic settings, African Americans are likely to be treated unfairly and are subjected to low expectations.

Rather than dis-identify with the group, some individuals will dis-identify with academics, which may result in underachievement. Although most research has failed to support the racial identity-as-risk perspective, few studies have found negative associations between racial identity and academic achievement (Harper & Tuckman, 2006; Worrell, 2007). Because of the limited research related to urban African American students' racial identity beliefs and its relationship among sense of belonging and academic achievement, more research is warranted. The current study examines the relationship between the individual components of racial identity (centrality, private regard, and public regard) and sense of belonging on the academic achievement of urban African American high school students. Three questions guided this research:

1. Is there a relationship between sense of belonging and racial identity among urban African American high school students?
2. How is racial identity related to urban African American high school students' grades?
3. How is sense of belonging related to urban African American high school students' grades?

Methods and Data Sources

This investigation utilized a quantitative methodology to collect and analyze three forms of data. Initially, a survey consisting of 69 items was administered to high school students. The survey consisted of four sections, which included demographic information (year in school, grades, gender, and race), racial identity, academic motivation, and sense of belonging (connectedness). The present study, however, used 41 items from the full survey, which included three sections: demographic information (self-reported grades), racial identity, and sense of belonging. Academic motivation was excluded from the present study.

The three components of racial identity (centrality, private regard, and public regard) were measured by the score on the Multidimensional Model of Black Identity-teen (MIBI-t) (Scottham, Sellers, & Nguyen, 2008). Students' sense of belonging was measured by the score of *connectedness* on the California Healthy Kids Survey Module A (WestEd, 2008).

Participants and Data Collection

Students in grades 10-12 (Table 1) from an urban public high school in Southern California were invited to participate in the study (*N=216*). The researchers randomly selected six classes from which to invite participants. Only students who submitted the appropriate

consent and assent forms were given the survey (*N=131*). The survey was administered in class for one hour. Only African American survey data were included in this study. The participants included 48 female and 57 male African American high school students (*N=105)*.

Table 1: Demographic Characteristics of Participants (N = 105)

Characteristics	*n*	%
Ethnicity		
African American	105	100
Gender		
Female	48	46
Male	57	54
Grade		
10th Grade	24	23
11th Grade	13	12
12th Grade	68	65

Data Analysis

A correlational analysis was performed to identify positive relationships between each of the three components of racial identity (centrality, private regard, and public regard) and sense of belonging, as well as students' self-reported grades (see Table 2).

Multiple regression analysis (see Table 3) was conducted to determine which, if any, of the three components of racial identity (centrality, private regard, and public regard) predict sense of belonging or grades.

Findings

Research Question One: Is there a relationship between racial identity and sense of belonging among urban African American high school students?

A correlational analysis was performed to identify positive relationships between each of the three components of racial identity (centrality, private regard, and public regard) and sense of belonging (see Table 2). The analysis revealed a positive correlation between centrality and sense of belonging, and between private regard and sense of belonging. There was no statistical association between public regard and sense of belonging. An analysis of multiple regression data revealed centrality as the only predictor of sense of belonging (See Table 3).

Research Question Two: **How is racial identity related to urban African American high school students' grades?**

An analysis of the data showed no statistical relationship among the components of racial identity (centrality, private regard, and public regard) and students' grades (See Table 2).

Research Question Three: How is sense of belonging related to urban African American high school students' grades?

This study revealed a positive relationship between sense of belonging and grades among urban African American participants (see Table 2). Multiple regression analysis was conducted

to determine if sense of belonging predicts grades. Table 3 summarizes the analysis results: sense of belonging was found to be a predictor of student grades.

Table 2: Correlation Table of All Variables

Measure	1	2	3	4	5
1. GPA	—				
2. Sense of Belonging	.22*	—			
3. Centrality	-.02	.38**	—		
4. Private Regard	.54	.28**	.58**	—	
5. Public Regard	-.99	.04	.26**	.28**	—

*Note. * p <.05, ** p <.01*

Table 3: Summary Table of Regression Analyses

Variable	B	SE B	β	T
Predicting Sense of Belonging				
Centrality	.29	.10	.34	2.95*
Private Regard	.11	.13	.10	.89
Public Regard	-.07	.09	-.08	-.79
Predicting Grades				
Centrality	-.12	.10	-.14	-1.14
Public Regard	.08	.09	-.10	-.98
Private Regard	-.09	.12	-.9	.80
Sense of Belonging	.23	.09	.25	2.35*

*Note. * p < .05*

Discussion

A major finding of the present study was that centrality is a predictor of sense of belonging. This suggests students with high centrality (students whose race is central to their self-concept) feel more connected to their school. Findings from this study support the racial identity-as-promotive perspective. Centrality acts as a buffer to negative racial stigma because of the social support received from fellow racial group members who also experience discrimination (Okeke, Howard, Kurtz-Costes, & Rowley, 2009; Oyserman & Destin, 2010). As a result, students may still feel connected to the school setting despite their perceptions of discrimination. Further, study results suggest that, for African American students to feel the sense of belongingness, schools must cultivate a culture of acceptance of all racial groups and promote positive teacher-student relationships.

The significant association between sense of belonging and grades found in this study is consistent with the literature related to sense of belonging and academic achievement (Anderman, 2003; Goodenow, 1993). For African American youth, the school setting may evoke

the fear of being stereotyped or the fear that they are not valued, in addition to other contextual factors that increase the risk of educational failure (Booker, 2006; Noguera, 2003; Steele, 1997). Understanding the significance of the role that sense of belonging has on the academic achievement of African American youth is important information for researchers, administrators, and educators charged with implementing policy, curriculum, and academic supports to ensure the success of these youth.

Educational Importance

There is an abundance of research that identifies the causes of urban youths' underperformance. Despite the challenges African American youth face, there are many who experience academic success (Thomas, et al., 2009). As a result, researchers know little about factors that contribute to the success of African American students who face barriers within the school environment (Noguera, 2003). The present study is important because it contributes to the limited literature related to sense of belonging and urban African American students' academic achievement. Although sense of belonging is important to the achievement of all students, it is particularly significant for urban African American students who often contend with negative stereotypes and racism that undermine their feelings of being valued in educational settings (Steele & Aronson, 1995).

The findings from this study reveal the significance of the teacher's role in promoting African American students' sense of belonging. African American students feel more connected to school when they perceive teacher expectations are high and they feel valued and cared for by other adults on campus (Booker, 2006). Teacher support within the classroom setting has also been found to promote mutual respect among classmates and positive peer interactions, which cultivate feelings of belongingness (Faircloth & Hamm, 2005).

An important implication of this study is the need for on-going professional development for teachers and school staff on the importance of cultural inclusiveness, cultural sensitivity, and research-based practices to promote positive teacher-student relationships and achievement. Research demonstrates that urban African American students benefit from establishing positive relationships with staff that exhibit a caring disposition and establish a safe environment for communication (Booker, 2016). Schools need to listen to students' voices, particularly students from marginalized groups, to diminish the cultural divide and understand how to best support them (Thompson, 2004). This can include opportunities for students to have mentors and work collaboratively with staff on school projects, school leadership, and decision-making. Providing these supports and strengthening the relationships with school staff will increase urban African American students' sense of belonging to the school and lead to increased academic achievement.

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Special Educators' Perceptions of State Standards in a Large, Urban School District

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ABSTRACT: The implementation of Common Core State Standards raises challenges for teachers, particularly those in urban settings and those who work with students with unique learning challenges, particularly students with disabilities. This article provides the results of a study that surveyed special education teachers' perspectives related to the implementation of the new state standards in one large urban school district. Analysis of both closed and open-ended survey responses yields information about teachers' experiences, perceptions, challenges, and perceived support needs for successful implementation of state standards with this unique population.

Keywords: urban education, accountability, special education, state standards

Introduction

Schools and districts around the nation are currently engaging in planning and implementing national standards for K-12 education (Haager & Vaughn, 2013). The National Governor's Association, in conjunction with input from numerous other educational organizations, developed new standards in mathematics and literacy to increase students' academic performance (National Governor's Association, 2009). This is particularly pertinent for urban school districts where a long and well documented history of inequities of access, achievement, and outcomes for students with disabilities has persisted (Cramer, Little, & McHatton, 2017). The Common Core State Standards (CCSS) are designed to ensure that students graduating from high school are college or career ready and that parents, teachers, and students have a clear understanding of what is expected of them. With the passage of the Every Student Succeeds Act (ESSA, 2015) states are required to adopt challenging academic standards, although they do not necessarily have to adopt the CCSS. The CCSS, adopted by 43 states, outline the expectations for students and are to guide teacher instruction. The purpose of the CCSS is to prepare the school-age population for college and careers or postsecondary experiences (Haager & Vaughn, 2013; Calkins, Ehrenworth, & Lehman, 2012). The CCSS focus on English Language Arts and Mathematics standards that are rigorous with the intention that students will be able to compete nationally and globally in the workplace and in postsecondary educational environments. In addition to adopting the CCSS, an assessment needed to be created that would assess if students were meeting the expectations and to inform all stakeholders of the results. The Partnership for Assessment of Readiness for College and Careers (PARCC, 2014), which consists of state-led partnerships, is one of the entities that was given the task of creating an assessment that would determine student attainment of the CCSS. A state-led coalition developed an assessment for students with the most significant cognitive disabilities (Dynamic Learning Maps, 2014).

Nationwide, there are currently some sources of information on how to implement the

CCSS with students with disabilities (e.g., Armstrong, 2012; Bulgren, Graner, & Deshler, 2013; Graham & Harris, 2013; Haager & Vaughn, 2013; Powell, Fuchs & Fuchs, 2013; Scruggs, Brigham, & Mastropieri, 2013); however, these are not based on empirical research but on analysis of the demands of the standards and the alignment of current best evidence-based practices. Nevertheless, all students with disabilities are included in statewide assessments related to the standards unless, due to extraordinary circumstances, the Individual Educational Plan (IEP) team determines that they are not able to participate in the state assessment. The literature available (e.g., ACCESS Project, 2014; Haager & Vaughn, 2013; Powell et al., 2013) posits all best practices that have been and could be effective. However, these do not address special education teachers' perspectives or awareness regarding students with disabilities using the standards to guide their instruction. This is particularly relevant in urban districts which routinely have higher percentages of the total student population receiving special education services. For example, according to the United States Census Bureau (2010), children with disabilities make up 5.2% of the school-age population or about 2.8 million; the district involved in this study, the largest most urban district in Florida, has 10% of its population of students receiving special education services. This is nearly twice the national average.

Despite the large number of students with disabilities, CCSS documents and supporting appendices, guidelines, and publications (Kober & Rentner, 2011) provide limited information about accommodating students with disabilities (Haager & Vaughn, 2013). Some state departments of education have provided limited information related to students with disabilities but these documents simply mirrored those already available from CCSS. This includes general information which essentially identifies the areas of the IEP that would be important to address when aligning IEP goals and services (e.g., assistive technology) to the CCSS.

In November 2013, Florida withdrew from the PARCC, revised the Common Core State Standards and renamed them the Florida Standards with the goals to: (a) maintain high education standards; and (b) remove the state from federal intrusion in education policy (Governor's Press Office, 2013). The Florida Standards were required to be implemented in all public schools in the State beginning with the 2014-2015 school year. The Florida Standards, which are comprised of Mathematics Florida Standards (MAFS) and Language Arts (English Language Arts) Florida Standards (LAFS), are being implemented with all students in the state, including students with disabilities, even those with the most significant cognitive disabilities via the Florida Standards Access Points.

Although the Florida Department of Education and other entities have provided some information related to the implementation of the MAFS and LAFS with students, including those with the most significant cognitive disabilities (ACCESS Project, 2014; CCSSO, 2013; CPALMS, 2014), there was a lack of information as to the perspective or understanding that special education teachers have related to the implementation of the standards to guide their instruction with students with disabilities. According to Bulgren et al. (2013), teachers, including special education teachers, would have to make changes that are complex and challenging to implement the new standards. Heifetz and Linsky (2002) indicate that changes such as these occur on two dimensions: (1) technical and (2) adaptive. Technical refers to knowledge and skills (e.g., teaching informational text), and adaptive changes involve adjusting beliefs, values, and attitudes as these relate to instruction, since implementation of new state standards would require planning and collaborating with other teachers.

The lack of information available, combined with the level of change expected of teachers, raised concerns about the preparedness of urban special educators to implement the

Florida Standards. In an effort to understand these teachers' knowledge and perspectives about the implementation of the standards, the *Implementation of the New Florida Standards with Students with Disabilities Survey* was sent to all special education teachers (approximately 2900) in the largest urban school district in the State of Florida. The purpose of this study was to determine the perceptions that urban special educators had about the implementation of the Florida standards for their students with disabilities and to determine if any relationships existed between teachers' background and their perceptions of the standards.

Methods

This study examined the perceptions of special educators on the new implementation of state standards for students with disabilities. Data were collected via a survey that contained both closed and open-ended questions.

Context and Participants

This study took place in Miami-Dade County Public Schools, the fourth largest and among the most diverse school districts in the nation. This large, diverse urban district serves a total of 355,268 students: 8% White, Non-Hispanic; 67% Hispanic; 24% Black, Non-Hispanic; and 1% of "other' ethnicity. Spanish is the most commonly spoken home language, and 74% of all students receive free/reduced price lunch. The total number of students with disabilities in the district is 34,834. The teaching force mirrors the diversity of the student body with 81% of the full-time staff coming from culturally and linguistically diverse (CLD) backgrounds. Of the 24,546 teachers employed by the district, 2,862 of them are special educators. All special educators in the district, regardless of the students with disabilities they were instructing, were emailed a copy of an electronic link to the survey in the body of an email that explained the voluntary and anonymous nature of the survey participation. Since this project was a collaboration between district personnel and a local university professor, the link to the survey was distributed via email directly from a district special education supervisor via a Survey Monkey set for anonymous responding to teachers' school email accounts. The teachers were sent bi-weekly reminders over a period of approximately two months until the survey submission deadline. Responses were received from 288 teachers. These teachers taught students covering a wide variety of disabilities, including but not limited to: learning disabilities, emotional and behavioral disorders, autism spectrum disorders, and intellectual disabilities. Table 1 shows the demographic makeup of the responding teachers. These demographics represent the overall demographics of the special education teachers in the district.

Table 1: Teacher Demographics

Age	%	N
18-24	0.0%	0
25-34	12.2%	35
35-44	29.7%	85
45-54	33.6%	96
55-64	23.1%	66

	%	N
65-74	1.4%	4
75+	0.0%	0

Gender	%	N
Female	89.5%	256
Male	10.5%	30

Years of Experience as Educator	%	N
0-4	4.0%	13
5-9	14.6%	41
10-14	23.2%	65
15-19	19.6%	55
20-24	13.6%	38
25+	24.2%	6

Years of Experience in Current Position	%	N
0-4	30.6%	85
5-9	23.3%	65
10-14	19.4%	54
15-19	10.4%	29
20-24	8.0%	22
25+	8.0%	23

Survey Instrument

The 28-question survey was developed by the researchers as a pilot tool since no other survey could be found that evaluated special education teachers' perceptions of state standards. The survey contained 10 questions that measured demographics of the teachers, such as age, gender, and years of teaching experience. Then, 15 Likert-style questions were proposed on a scale of 1-4 representing disagree (1), somewhat disagree (2), somewhat agree (3), and agree (4). These questions measured teachers' knowledge of, confidence in implementation of, and comfort level with the new Florida standards, as well as their perceptions of how these standards would affect their students. The final three questions were open-ended and sought to examine how teachers' prior training or experience had affected their ability to implement the standards, their general opinions about the standards, and their implementation support needs.

Research Design and Analysis

All the information obtained from the demographic and Likert scale responses were entered into IBM Statistical Package for the Social Sciences (SPSS) software file to be analyzed. All data collected were entered into SPSS in numerical format; any data not originally provided by the participants in numerical format was transcribed based on a predetermined conversion protocol. After all available data were entered into SPSS, descriptive statistics, including mean and standard deviation, of teachers' responses was first generated in order to obtain a full picture of the teachers' perceptions on the standards. We then ran reliability analysis for the 15 survey items that focus on teachers' perceptions. Cronbach's alpha was used to indicate the internal consistency of the items (Thorndike & Thorndike-Christ, 2010). Further, correlation analyses were conducted to determine if there were statistically significant relationships between teachers' training/experience in special education or years of teaching experience and their perceptions of state standard implementation. Pearson's correlation coefficient was employed in the analysis because it measures the strength of the linear relationship between two quantitative variables (Hauke & Kossowski, 2011).

The open-ended questions were analyzed to obtain more detailed information to assist in explaining the SPSS data analysis results. Categories were coded and themes were identified in the analysis to provide additional information to the quantitative data collected (Bogdan & Biklen, 2007). Coding categories were identified to assist in identifying regularities and patterns that existed in the responses from the participants. Coding was conducted by a district-level special education supervisor and a university professor. Identified codes and themes of each were then compared for overlap. Together, these researchers created categories that were translated into trends or common conceptions held by the participants. The purpose of the open-ended questions was to allow the participants to further express their beliefs in the constructs being studied.

The responses from each question were reviewed with the intent of identifying a common theme. Each participant's response to the open-ended question was read one at a time. Each new response was coded as a possible theme; each additional response was reviewed. If the participant's answer could be grouped with an existing possible theme, it was recorded to indicate that the theme was repeated. If the response indicated a new theme, this new theme was provided a new code. This was repeated with each participant who responded to the open-ended questions. It should be noted that not every open-ended question was answered by every participant (approximately 170 out of 288 participants answered the open-ended questions).

Results

Survey responses can be found in Table 2. Mean responses show teachers were aware of the implementation of the new standards, with questions 11 (*I am aware of the Florida standards being implemented*) and 23 (*I am aware that for students on a modified curriculum, the Florida Standards for English Language Arts and Mathematics which include CCSS will be the Access Points*) being the highest rated responses and the only ones that fell into the "somewhat agree" or "agree" category. The lowest mean responses that fell into the "disagree" category included question 21 (*Parents of my students with disabilities understand the standards*) and question 18 (*My students will be able to keep up with the pace of the standards*). Overall, most questions fell into the "somewhat disagree" category. Additionally, the reliability analysis of the 15 items showed that Cronbach's alpha is .93, which is very high.

Table 2: Closed-Ended Survey Question Means and Standard Deviations

Survey Item	Mean	Standard Deviation
Aware of Implementation Start Date	3.82	0.59
Aware of Effect on Current Teaching Assignment	2.95	1.24
Confidence in Implementation	2.55	1.55
Have Been Trained to Implement	2.38	1.61
Trained to Implement with Students with Disabilities	1.96	1.6
Comfortable Implementing IEPs	2.35	1.65
Student Can Successfully Access FL Standards	2.02	0.41
Students Can Keep up with Pace of FL Standards	1.44	1.72
Students Can Meet FL Standards	1.53	0.5
Students Understand FL Standards	1.70	1.58
Parents of Students with Disabilities Understand FL Standards	1.37	1.6
Students' IEP Goals are Aligned with FL Standards	2.52	1.76
Aware of Access Points for Students on Modified Curriculum	3.34	1.5
Have State Adopted Textbooks	2.42	0.82
Have Necessary Classroom Materials	2.22	0.37

Results of the correlation analysis showed a statistically significant relationship between years of teaching experience and confidence in implementing the Florida standards, and between years of teaching experience and ability to align students' IEP goals with the standards. The results of Pearson's correlation indicated that years of teaching experience showed significant correlations with confidence in implementation with a Pearson's correlation coefficient of -.128 ($p < .05$). The years of teaching experience also showed significant correlations with teachers' ability to align IEPS with the Florida standards with a Pearson's correlation coefficient of -.132 ($p < .05$).

Open ended responses indicated that teachers had received limited training in the standards, and the trainings that were received were not specific to students with disabilities. For example, one teacher writes, "The training has been minimal and rarely do they focus on SPED [special education] students other than they have to meet the same standards with accommodations." Another teacher states, "The training I have received was geared towards

students in the general education population, not the students with disabilities."

Teachers who had received training indicated that they felt more confident to implement the standards after completing training. For example, one teacher writes, "The various trainings have affected my method or practice of teaching by allowing me to ensure opportunities for incorporating an array of teaching strategies, along with offering a supportive learning environment, which encourages and fosters students' learning and engagement. Also, my autonomy in teaching is not suppressed." Another teacher states, "After I have done a workshop outside my school to learn how to adapt the new CCSS to my students with disabilities, I've been able to help my students understand the new standards."

There were clear concerns expressed among the teachers that their students would not be able to meet the new standards and that the standards did not take individual student needs into consideration. One teacher captures this by stating, "The vast majority of my students are not able to access the new Florida Standards. They are the children being left behind. One size does not fit all." These concerns were particularly evident in the pacing and rigor of the standards. Another teachers writes, "I feel that it is very difficult for them. My students try their best but in a class of SLD [specific learning disabilities] part of their disability is retention and not able to process information the way it is required in the new standards. It's overwhelming for both myself and the students. Geometry requires a lot of memorization of rules which they forget the next day. If they had the capabilities to make inferences and interpretations then they wouldn't even be in my class in the first place but in an honors class." Another teacher captures a similar sentiment with, "The standards are out of touch with the needs of my students. The standards' rigor, pace of delivery, and complexity of presentation is a recipe for disaster."

The most commonly requested supports from teachers included strategies and hands-on materials and workshops or trainings on implementation of the standards for students with disabilities, or as one teacher called it "trainings, materials, and technology." Another common request was for support in aligning IEPs with the standards, or as one teacher requested, "training in order to implement the new standards appropriately and use them in our IEP implementation."

Discussion

While teachers appeared aware of the implementation of the new standards, the lack of confidence, lack of training, and concerns about their students' abilities to be successful with the new standards was evident across both the open-ended and closed-ended responses. There was also a notable gap between teachers' awareness of the standards (highest rated response) and teachers' perceptions of parents' awareness (lowest rated response). This raises concerns about parental involvement in standards implementation and active participation in IEP meetings, particularly when annual goals, some relating directly to standards (e.g. literacy expectations, math computations) are being developed.

Teachers' comfort level with standard implementation was higher than their ratings of how well their students would fare in accessing these standards. Since teachers with more teaching experience were more confident in their ability to implement the standards and to align the standards with IEP goals, urban schools that typically have higher teacher turnover and less experienced teachers (Balfanz, Bridgeland, Moore, & Fox, 2010) may be at higher risk for teachers who are not confident or prepared to implement new standards for students with disabilities.

Themes from the open-ended questions reveal that the limited trainings that special education teachers had in the Florida standards were often not specific to students with

disabilities and that this would be a necessary component. More training was called for in aligning state standards with IEP goals. Special education teachers need to have extensive knowledge of how to support students with disabilities achieve the rigorous content standards (Lekol, Brownell, Sindelar, & Kiely, 2015). This in-depth understanding of how to support students with disabilities includes several areas such as cross-curricular collaborative skills (Council of Chief State School Officers, 2012; Lekol et al., 2015), accommodations, and adaptations to the curriculum. Teachers, particularly urban special educators who typically provide instruction and supports to the most diverse students, need to be able to understand the standards, align them to a student's IEP, and adapt accommodations and modifications so that instruction for students with disabilities is designed and provided in a cohesive and precise manner so students can access and achieve the expectations of the new state standards. Special education teachers must find the difficult balance to both provide individualized instruction that is explicit, direct and systematic, as well as meeting the required standards.

Clear concerns were raised that students with disabilities would not be able to meet the new standards and that philosophically these standards did not take the individual needs of students into consideration. The concerns of these teachers were echoed in other parts of the country. Zorn (2015) stated that "If average and above students are struggling, imagine what it must be like for my students -- children with severe dyslexia, ADHD, Asperger's syndrome and other learning disabilities" (p. A,13). According to Corlett (2014), special education teachers who work with students with disabilities are concerned with the implementation of the standards; teachers in general education are equally concerned with the adaptability of the CCSS for students with disabilities.

This is particularly concerning in urban settings as it has been long established that teachers in urban schools are not prepared for the cultural complexities of diverse communities (O'Connor & Fernandez, 2006). With established disparate outcomes for CLD learners in urban settings extending from the earliest grades into post-secondary and career outcomes (Darling Hammond, 2010) and a documented lack of access to necessary supports and services (Ford & King, 2014; Oakes, 2010), the implementation of new state standards for students who are diverse in culture, language, and ability without necessary supports for teachers could be particularly problematic for this most vulnerable population. This was also evident in responses provided in Corlett's (2014) study, particularly as it relates to English language learners.

Implications and Conclusion

If Heifetz and Linsky's (2002) change dimensions are revisited, it is evident that teachers in urban settings, particularly those working with students with disabilities in general or special education settings, will need adaptive and technical supports. In addition to providing more knowledge and training about how to implement state standards, there will also be a need to establish supports that can adjust teacher beliefs about standardized curriculums, the abilities of their students, and the alignment of standardization efforts with the individualization of special education. Further, school districts and institutes of higher education should partner to establish supports for teachers in their induction year and beyond to reduce teacher attrition and keep seasoned teachers in urban classrooms. The seasoned special education teachers can provide the new inductees with mentoring assistance in the area of standards implementation, since years of teaching experience was the most significant factor in teacher confidence to implement standards and the ability to align the standards with IEP goals. It is critical to keep experienced special educators in the field and reinforce their confidence by providing them with these leadership

mentoring experiences.

It is also essential for special educators, particularly new inductees, to overcome the affective challenge of the implementation of the standards so that the individual needs of students with disabilities are addressed. Teacher effectiveness is positively correlated with higher student achievement (Hora & Farrare, 2012). However, if teachers' self-efficacy has a significant impact on their ability to instruct students with disabilities on CCSS or state standards expectations, this will have a significant impact on special education students' academic success. Teachers' efficacy in the implementation of said standards must be ensured through external factors, such as support from district offices in the form of targeted professional development, support from school site administrators, and support from other faculty members (Cash, 2014).

Institutions of higher education educator preparation programs will have to review their foundational pedagogical anchors, such as deliberate practice with performance feedback approaches (Lekol et al., 2015), to determine which are essential for special education teachers. This will ensure that they acquire and are able to generalize in practice the skills needed to address the current trends in the context of schooling and special education (e.g., state standards, multi-tiered systems of support). These skills include knowledge of such distinct concepts as the impact of language (e.g., text demands) within the prescribed state standards (Cash, 2014). Preservice and inservice teachers can also be supported in learning to communicate effectively with parents about the standards and provide them current available resources. Teachers can also acquire the knowledge on how to conduct parent training related to the standards and their role in IEP development and implementation. As parents' understanding of state standards was the lowest scoring variable on the survey, teachers may not be adequately prepared to communicate with parents about critical issues such as the new standards, particularly CLD parents who often make up the majority of families in urban schools.

While it is important for all students to have access to rigorous curriculum and for teachers to be held accountable for the achievement of their students, the implementation of Common Core or state standards is not a simple task, particularly for diverse learners within urban districts. With the recent passage of the ESSA legislation and the shift toward increased state and local authority over educational policies and services, it is imperative that efforts are made to ensure our most vulnerable students and families are considered and their teachers are supported to best be able to meet their needs. These efforts should include partnerships between research institutions of higher education and local school districts to ensure that all teachers have access to the latest research findings, knowledge, resources, and supports to best educate students with disabilities. Through collaborative and targeted efforts, students and teachers will have the best chance of meeting high standards.

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Breaking the Cycle of Incarceration:
A Young Black Male's Journey from Probation to Self-Advocacy

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ABSTRACT: The prison-industrial complex penetrates the public sphere through enhanced and militarized police presence in poor neighborhoods, thereby playing a key role in mass incarceration, and intersects with public schools via zero-tolerance policies that push students out. The purpose of this article is to examine how the Juvenile Justice System (JJS) impacts the educational experiences of Black males. Specifically, we present a case study of Malcolm, a multiracial (Black, Latino, and Native American) male who had been part of the JJS for the last five years. We articulate Malcolm's schooling and JJS experiences to discuss how the prison industrial complex and school-to-prison pipeline intersect to push marginalized youth of color out of schools. We conclude by listing a set of recommendations in which Malcolm provides key strategies to reform the JJS and school-to-prison pipeline.

Keywords: juvenile justice; Black males; advocacy; empowerment; school-to-prison pipeline

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Brewer and Heitzeg (2008) describe the prison-industrial complex as "a self-perpetuating machine" where vast profits and "perceived political benefits" lead to designing policies that "ensure an endless supply of clients for the criminal justice system" (p. 637). This system penetrates the public sphere through enhanced and militarized police presence in poor neighborhoods, which plays a critical role in mass incarceration. Additionally, the war on drugs, along with stop-and-frisk and civil gang injunctions, racially profile and target poor youth of color by marking their bodies and the spaces they occupy as criminal and dangerous (Fasching-Varner, Mitchell, Martin, & Bennett-Haron, 2014). As a result, Black youth are four times more likely to be incarcerated over their white peers (Burns Institute, 2016).

Thus, the purpose of this article is to examine the following question: How does the Juvenile Justice System (JJS) impact the educational and life experiences of Black males? Specifically, we present a case study of Malcolm, a multiracial (Black, Latino, and Native American) male who had been a part of the JJS for the last five years. In the next section, we discuss the school-to-prison pipeline and how it contributes to the criminalization of the Black male body. In our findings, we articulate Malcolm's schooling and JJS experiences to raise awareness of the difficulties facing marginalized Black males. We conclude the article by listing a set of recommendations in which Malcolm articulates how to reform the JJS and school-to-prison pipeline. The article utilizes educational and penal realism (Fasching-Varner et al., 2014), which builds on Bell's (1992) racial realism, as our framework.

School-to-Prison Pipeline

Regardless of age or grade level, Black students have been disproportionately impacted as it relates to school arrests, suspensions/expulsions, and office referrals, which pushes Black males in particular out of the education system and into the criminal justice system (Alexander, 2011; Allen & White-Smith, 2014; Dancy, 2014; Gregory, Skiba, & Noguera, 2010; Howard,

2013; Skiba, Arredondo, & Williams, 2014; Stevenson, 2014). This school-to-prison pipeline (STPP) is based on the myth that Black males are naturally violent and must be controlled. The proliferation of zero-tolerance policies, school resource officers (SROs), and an over-reliance on school expulsions and suspensions has transformed many urban schools from institutions of learning and hope, to prison cells that are adorned with metal detectors, drug sniffing dogs, and heavy police presence (Allen & White-Smith, 2014; Dancy, 2014). The end result is that the STPP negatively impacts school climate, engagement, academic achievement, and increases dropout rates by criminalizing benign infractions such as dress code violations and placing the Black body under constant surveillance.

Theoretical Framework

The prison-industrial complex and STPP bring to light what legal scholar Derrick Bell (1992) calls racial realism, which articulates how the subjugation of Blacks is entrenched into the fabric of our society. To buttress this point, Bell (1992) explains, "[M]any of the black people we sought to lift through law from a subordinate status to equal opportunity, are more deeply mired in poverty and despair than they were during the 'separate but equal' era, a reality confirmed not only through abysmal public schooling but also through the prison industrial complex" (p. 374). Moreover, Bell conceded that regardless of the herculean efforts to obtain racial equality, they were only short-lived victories due to the preservation of White dominance and racist mechanisms.

Building on this concept, Fasching-Varner et al. (2014) present what they call educational and penal realism to describe how there are built-in advantages that help to support and maintain the current flawed system, which results in blocking potentially beneficial education and prison reforms. The intersections of STPP and the prison industrial complex are too glaring and intentional because failing urban schools lead to a healthy and constant influx of new inmates. They explain concisely, "[W]ithout school failure there is no opportunity for an educational reform-industrial complex, and without people to punish, similarly, there is no need for the prison-industrial complex" (p.411). While they present seven tenets, we concentrate only on two, due to space, because these two tenets highlight how STPP and the prison-industrial complex converge to marginalize communities of color.

The first tenet states that there is "no crisis in schools or prisons—each institution is functioning per their design and the demands of the society" (Fasching-Varner et al., 2014, p. 420). As stated earlier, the role of the criminal justice system has deep historical roots within policing, prosecuting, imprisoning, and executing people of color (Alexander, 2011; Brewer & Heitzeg, 2008). This tenet articulates why we continue to have an achievement gap and why the U.S. prison population is the highest in the world even though crime rates are near an all-time low.

A second key tenet is "neither schools nor prisons will ever represent, serve, or address the interests of the most marginalized and underrepresented of society" (p. 421). This tenet plays out in education in terms of the long fought battle to desegregate our schools. From magnet programs to AP classes, there is a continuous underrepresentation of youth of color within these programs. Within the criminal justice system, this tenet is observed through three-strikes legislation, mandatory minimum sentencing guidelines, the war on drugs, and the discrepancies between crack-cocaine vs. powdered-cocaine sentencing.

The intersection between schools and prisons takes the form of the STPP in that as early as preschool and kindergarten, Black youth are suspended and expelled. As Noguera (2003)

articulates, "disciplinary practices in schools often bear a striking similarity to the strategies used to punish adults in society. Typically, schools rely on some form of exclusion or ostracism to control the behavior of students" (p. 342). In sum, educational and penal realism has the potential to help us critically analyze "the absurdity of the manufactured crisis" (Fasching-Varner et al., 2014) that is public education reform and the prison-industrial-complex. It also illustrates how these two seemingly disparate factors actually converge to hurt and damage marginalized and oppressed populations.

Methodology

A case study is a type of empirical inquiry with the purpose of investigating a bounded case, which can be a situation, instance, or person, narrowed in scope and focus that will examine real life context for contemporary phenomenon (Savin-Baden & Major, 2012). Even though Malcolm is a multi-racial male, he strongly identifies as being Black because he was raised immersed in Black culture. During his interview, Malcolm stated that he was Black on his dad's side and his mom was mixed with Mexican American and Native American.

He is a member of Leaders Organizing 2 Unite & Decriminalize (LOUD), which was created as a partnership between a grassroots community organization and a county JJS in the Southwest. As a juvenile justice youth council, LOUD has had direct impact on juvenile justice policies. For the purposes of this article, we focus specifically on data collected on Malcolm since his story speaks to the intersectionality of the JJS, STPP, and the overrepresentation of Black males in the prison system. He is 17 years old with twists and has a solid build. Malcolm is extremely bright and adores his two younger sisters and is being raised by a single-parent mom. He loves to rap and joined LOUD because wanted his voice to be heard. He is an active member of LOUD who speaks passionately on issues of social justice because he knows firsthand how severe poverty and food insecurity impact families. Malcolm has been out of school for four years since becoming system-involved and is trying to navigate his way back.

Data was collected during the 2015-2016 academic year and included field notes, individual interviews, and transcripts from the usually two-hour weekly meetings. All data sources were examined through naturalistic evaluation (Savin-Badem & Major, 2012), which "attempts to present a 'slice of life' episodes documented through natural language and representing as closely as possible how people feel, what they know, and what their concerns, beliefs, perceptions, and understandings are" (p. 278). The data was then uploaded to the Dedoose data analysis software for additional thematic coding. Themes were organized into 14 main categories such as the following: gender, education, JJS, voice, and advocacy. The data was organized using these categories and aided in the creation of thematic memos that were used for analysis.

Results and Discussion

The findings section is broken into three main parts: 1) involvement with JJS, 2) schooling, and 3) empowerment, to illustrate how educational and penal realism impacted Malcolm.

Involvement with JJS

At age 12, his life changed dramatically forever due to a domestic dispute that ultimately ended up tying his fate to the JJS for the next five years. While we do not condone drinking, Malcolm was heavily intoxicated the day he was arrested. He was involved in a small physical altercation with his mother where Malcolm pushed her aside when she hit him. The police were

called to frighten Malcolm, but not to arrest him. Malcolm's charges were initially intoxication of a minor, domestic battery, and criminal destruction of property, but all charges were later dropped to criminal destruction of property. By involving the police, a case of parental discipline ended with a child being charged with a crime. We maintain that this situation would have been handled drastically different if Malcolm was not racialized as a Black male, or if he had access to monetary resources.

Malcolm's mother did not intend for the cops to arrest him, but to only scare him so he would shape up. Moreover, she and Malcolm only conceded to the conditions of his probation because they "were very new to the system and [they] really didn't understand what was going on…[T]hey felt that [they] didn't have a choice." Lastly, their public defender did not properly advocate for them or explain all of their options.

A simple dispute started a five-year ordeal in which Malcolm was periodically placed in treatment and detention centers and, ultimately, was assigned to Drug Court. During this period, Malcolm noted that his mom "didn't have the resources to really do Drug Court" because of a lack of transportation, funds, and "medical issues" of her own. When they tried to inform Drug Court of these issues and advocate for themselves, Malcolm's probation officer (PO) responded punitively by stating that his mom was a "bad influence", "toxic", and that "[The PO] didn't want [Malcolm] to be in contact with [his mom]." Furthermore, the PO tried to force compliance with threats of more probation and/or a call to the Children, Youth, and Family Department (CYFD) to report them.

Eventually, CYFD did open an investigation, which caused trauma because Malcolm and his sisters were placed in foster care. He had no contact with his family for several months. During this time, he stated you "constantly fee[l] like you can't do something good, constantly fee[l] like there is no hope[.] You feel powerless because you have no control over yourself or your situation." This ordeal caused unnecessary stress and made him want to go on the "run" (i.e., abscond) so that he could be with his family. Subsequently, the investigation was dropped. However, this situation demonstrates the power POs have to force families to comply, despite causing overwhelming economic, emotional, and mental stress without understanding the socioeconomic and racialized inequalities of their lived realities.

Schooling and the Criminalization of Black Bodies

Within public education, Black males are one of the most socially and academically marginalized groups since they are disproportionately targeted in terms of suspensions, expulsions, and school arrests (Dancy, 2014; Howard, 2013; Noguera, 2003; Skiba et al., 2014). Moreover, 35% of young Black men who were incarcerated were unable to complete high school (Western & Pettit, 2010). Malcolm reflected on how racialized Black bodies are associated with criminality and fear:

> A lot of [people of color] are struggling...And I think that gets misconstrued as violence…People carry themselves a certain way and that can be seen as intimidating or aggressive…So, I think that's why [youth of color] are looked at as criminal youth. You don't think of criminal youth, and think of a bunch of little white kids, honestly, usually-a dark boy—it's mostly a Black kid….

Here Malcolm articulated the very essence of educational and penal realism. He comprehended how Black bodies are unfairly misconstrued as aggressive, violent, and criminal. More importantly, he discussed the prevailing stereotype of criminality as Black youth.

By the age of 12, he felt teachers and school administrators were unfairly targeting him. Malcolm explained:

> [A]fter I got put on paper [probation], now they have an excuse to send me out and to do certain things that might not be too fair…because I am on the ankle bracelet…because they feel unsafe because of my size. That's how they had an excuse to kick me out of class or to write me up for little things. Or even shout at me a few times. They would single me out in front of an entire classroom of people just because I said something. I am not one to pull the race card [b]ut I feel it was because of my race, my ethnicity…my size again.

Additionally, he pointed out that constant visits from POs marked him as a threat, as much as his ankle bracelet. In essence, Malcolm describes the adultification of Black boys in schools, which refers to the ways that acts of childhood transgressions are interpreted as sinister and stripped of any innocence that people generally ascribe to children (Dancy & Brown, 2012). Likewise, Malcolm affirms what Fine & Ruglis (2009) describe as disciplinary practices, especially in urban public schools, that act to physically move and target young people of color from schools into juvenile detention facilities. These experiences illustrate how schools criminalize, racially profile, punitively target, and overpolice Black bodies, manifested through educational and penal realism.

To complicate this situation further, Malcolm became increasingly disengaged with school. He stated, "I didn't like school. I always felt like I was behind everybody else. I didn't really understand everything that was going on. I just didn't feel engaged." It is not surprising Malcolm would have such attitudes because his schooling was constantly interrupted by multiple placements in various treatment and detention facilities. In addition, when teachers and administrators targeted him through punitive means, these actions marginalized him and made him disengaged from school even more.

Students like Malcolm are ostracized, not only because of race and class, but also because of being incarcerated. They experience negative interactions with teachers and administrators routinely in schools. Rather than educators supporting and nurturing his growth and development, they actively tried to push him out of school by driving him away until he felt that he did not belong. As a result, Malcolm has been out of school for the last few years. One of the authors took him to a community college to pursue a GED program where he was tested in both reading and math. Remarkably, Malcolm tested at a 12th grade math level and at college level for reading; this demonstrates how his academic potential was completely ignored due to the biases of his previous teachers and administrators. The important lesson here is that schools must address these shortcomings and find solutions and more productive ways to engage incarcerated students without labeling them as threats.

Empowerment

Malcolm described the reasons he likes being in LOUD:

> [i]t feels good to be heard and feel that somebody is actually going to listen to you and feel that somebody cares about what you think is wrong... I feel like LOUD genuinely opens their ears and they listen to what we have to say…. I feel in LOUD a lot of real issues and real problems get addressed and that alone, whether we make changes or not, helps the wellbeing of youth.

This quotation explains how, through LOUD, Malcolm was able to find his voice and fight back against the system. More importantly, Malcolm discussed how LOUD attempts to help youth address their "real issues and real problems" so that they can successfully complete the conditions of their probation agreements and eventually exit out of the JJS.

After five years of being system-involved, Malcolm stated that he was frustrated because

someone else had made every decision for him and he felt powerless. He felt that some of his peers with more serious offenses were getting off probation more quickly and the technicalities that prevented his progress were unnecessarily punitive. He realized that Drug Court was not benefiting him, but rather causing him more harm. Therefore, he worked with his public defender and LOUD facilitators who helped him to navigate the formal court system and learn how to negotiate his own plea agreement by representing himself in court. Malcolm recalled the steps he took in order to empower himself to change his own situation:

> I decided that I need to write down how long I was on probation, how long I spent in jail, spent in treatment, how many probation officers I had and things like that…[A]t the termination hearing, I requested to be taken off of Drug Court. I don't feel that I would have been taken off of Drug Court if I hadn't asked for it...At that point I was placed on regular probation.

This was an unprecedented move because he was one of the first youth to represent himself in court and ask for a change of terms in his probation. After this initial success, Malcolm went on to work out an agreement with the judge for his next hearing where he represented himself again and petitioned the judge to be placed at a residential treatment center with the understanding that if he successfully completed his stay that he would be released from probation. The judge agreed. After completing his stay, Malcolm had his final hearing where the judge complimented him on his successful completion of the program, remarked multiple times how proud she was of him, and said she saw him as a remarkable young man who has tremendous potential.

Malcolm is an exceptional example of what marginalized youth can accomplish when given the proper support and tools to help achieve their own successes. With the help of knowledgeable adults, other youth can learn how to represent themselves in court and advocate for their own interests. Ultimately, Malcolm's example showcases the power of youth finding their voice.

Implications and Conclusion

This article has focused on profiling Malcolm's experience with incarceration and STPP, as well as how he fundamentally advocated for himself. Through his case study, we illustrate the reality of educational and penal realism that marginalized youth encounter once they are system-involved and how it converges with the STPP. In other words, this case study provides a powerful narrative on how schools further oppress and target system-involved youth through school discipline.

We conclude here by discussing how youth activists, such as Malcolm, have key solutions to help improve the JJS. When asked about what types of reforms should be implemented in order to improve his experiences with the JJS, Malcolm provided four main suggestions: improving the quality of staff; individualizing and tailoring therapy programs to each youth's unique situation; raising awareness of the causes and realities behind the youths' lived experiences; and remembering that these youth are not hardened criminals to be dismissed but are children that make mistakes.

Having more caring, involved and supportive probation officers could make a huge difference in the lives of incarcerated youth. Malcolm stated, "[I]f the probation officer cares in the first place, it is like a big deal. Cause if they don't care about your situation at all then there is no real good that they can do." He further explained that probation officers can make a big difference by being more compassionate like asking their clients, "What is going on at home?" and how they can assist them in addressing these issues. Otherwise, too many incarcerated youth

"fall under the radar" because they are not receiving the proper support and fall "by the wayside" because probation officers are not helping them and their families deal with pertinent issues, such as poverty and schooling. The JJS needs to tailor their programs so they are geared toward addressing the needs of youth and their families, rather than focusing on compliance and rules that do not address the core issues that enable them to heal and grow.

A second key recommendation Malcolm had was to focus on "genuine therapy" that was not only "geared towards getting off the program" and "working through the rules of Drug Court." He suggested it should also focus on the "well-being of the youth" so they can succeed even after they complete Drug Court. Malcolm powerfully articulated, "[Drug Court] is like cattle, getting you in and getting you out. Moving people in and getting them out." We contend that such an approach caused Malcolm to be unable to complete Drug Court and consistently fail.

This leads to the last point: we must change the language of accountability. Most probation officers would state that Malcolm was trying to escape accountability by absconding and violating his probation terms instead of recognizing that he was on probation for five years. Malcolm realized that he did make many mistakes; however, he also wanted the system to acknowledge that this failure of compliance was due to poverty, which directly impacted having access to adequate food, housing, and clothing. Furthermore, he was racially profiled and treated unfairly due to the over-policing of his Black body in his schools and in the community. Therefore, Malcolm is not advocating for a free pass, but rather a plea for more understanding and empathy. Lastly, JJS personnel, educators, and school administrators need to be reminded to stop criminalizing normal teenage behavior. As Malcolm stated poignantly, "[Y]ou can't punish somebody and expect them to learn something if it is just going to be more stressful, more traumatic for them." We need to remember that children, many of whom have experienced traumatic events at an early age and are racialized, classed, and gendered, can act out in normal teenage angst due to this trauma.

As educators and researchers, we urge other adults who work with these populations to be critically conscious, aware, and sensitive to the biases, stereotypes, and labels that can negatively affect the educational experience of these youth. The recommendations that were given by Malcolm can be applied to educators and administrators, as well. Hiring caring and supportive staff, teachers, and administrators who tailor educational plans that aid in the support and success of marginalized students will greatly increase student engagement and academic success. By recognizing their lived experiences, schools serve as institutions of learning for all their students. Overall, this study demonstrates how we can empower youth to create systemic change in institutions that are not always designed to ensure their success by helping to support youth, instead of imprisoning them so they feel trapped without voice or power.

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"Life Skills": A Single-Sex Classroom Intervention for Black Boys Transitioning from Middle School to High School

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ABSTRACT: The transition from middle school to high school can be difficult for many students due to increases in school size, the structure of an academic schedule, and the complexity of social interactions in high school. However, Black boys face unique challenges during this transition period due to racism and structural inequalities. In response to these obstacles, schools across the country have created single-sex spaces specifically for Black boys to improve academic and social outcomes for students. The current study examines one such intervention located in an urban school district in the San Francisco Bay Area through interviews with four students to better understand how they make sense of their experiences within a specific single-sex classroom as they transitioned into high school. Findings from the study address the important role teachers play in shaping students' transitional experiences. Implications for single-sex learning spaces for Black boys are also discussed.

The transition from middle school to high school can be difficult for many students regardless of their social identity. Researchers have characterized this time period as being particularly risky for adolescents who are developmentally vulnerable to social stressors, especially as they move from a familiar schooling environment with peers they have known for years to a larger schooling environment often populated with students coming from different feeder schools (Chung, Elias, & Schneider, 1998; Erath, Flanagan, & Bierman, 2008; Evans & Eder, 1993; Pellegrini & Van Ryzin, 2011). Transitioning students must find ways to cope with dramatic increases in school size, the structure of an academic schedule, and the complexity of social interactions in high school (Felner & Adan, 1989). Due to these stressors, students can experience a drop in their academic performance as they move into secondary schools (Willens, 2013). However, consequences of these barriers are felt more dramatically by Black boys attending school in urban communities.

Roderick (2005) argues that Black boys face unique challenges during the transition from middle school to high school for three notable reasons. First, Black boys, on average, have the fewest resources to meet new academic and social challenges. Persistent disparities in teacher expectations, curriculum, and structural support have produced significant gaps in the level of academic preparation of Black boys compared to their peers (Delpit, 2010). The second reason Black boys are particularly at risk is because they, more than any group, "experience the most dramatic declines in support and the quality of relationships and school experiences as they make the move to high school" (Roderick, 2005, p. 157). Urban adolescents' perceptions of degree of challenge from their coursework, expectations from their teachers, and quality of both their environment and relationships with teachers significantly decline as students transition into high school (Reyes et al., 1994; Seidman et al., 1994; Simmons et al., 1991; Simmons & Blyth, 1987). Finally, Roderick notes that, even if they have skills and supports similar to their peers, Black boys "would remain at risk because they have fewer positive coping resources and are more

likely to adopt negative coping mechanisms, such as avoidance or withdrawal" (p. 158). Negative previous schooling experiences and an awareness of teachers' negative perceptions can lead to active resistance of teachers and poor academic performance (Solórzano & Bernal, 2001).

One response to the challenges faced by Black boys as they transition into high school that has been growing in popularity in recent years has been the creation of single-sex learning spaces. Defined by Terry, Flennaugh, Blackmon, and Howard (2014) as "any educational setting in which students are separated by sex as a component of a broader strategy developed to achieve one or more educational objectives associated with students' academic performance outcomes and/or overall 'citizenship' within the school community" (p. 669), schools in urban communities across the country have implemented single-sex learning spaces to meet the needs of Black boys. One such space is the Life Skills course taught by Mr. Graham for all ninth grade Black boys at Wolverine High School.[1] Mr. Graham's Life Skills class includes lessons that cover students' basic rights and liberties; thoughtful analysis of writings from key figures in African American poetry and literature; the history of Black people in the U.S. with particular attention being paid to the life story of Malcolm X and the Willie Lynch letters; and the current state of Black education in their school district and nationwide. While Mr. Graham's efforts can be positioned as part of a growing effort to create programmatic interventions aimed at addressing the challenges faced by Black boys as they transition into high school, more research is needed to understand the impact of these single-sex spaces on the schooling experiences of students. Additionally, research is needed that prioritizes analysis of the voices of Black boys as they make sense of their experiences in single-sex spaces while transitioning from middle school into high school.

Research Questions
  1) How do Black boys make sense of their experiences in the Life Skills class, specifically within a broader context of their high school?
  2) What can we learn from the voices of Black boys about how the components of the Life Skills class hold promise for impacting their schooling experiences as they transition from middle school to high school?

Critical Race Theory

A key theoretical framework that guides the current study is Critical Race Theory (CRT). Originally developed by scholars of color seeking to challenge legal orthodoxy concerning people of color in the criminal justice system, CRT within the field of education aimed to address the role that race and equity play in educational research, scholarship, and practice (Delgado, 1995; Ladson-Billings, 2000; Ladson-Billings & Tate, 1995; Solórzano, 1998; Solórzano & Yosso, 2002). The inclusion of a critical race framework is especially warranted when one considers the unique challenges faced by Black boys transitioning into high school that are a direct result of the subjugated status of these students, which often manifests in lowered expectations and fewer education resources in U.S. institutions of education due to their race. CRT acknowledges the permanence and pervasiveness of race, racism, and the lack of equity and social justice for communities of color. As Ladson-Billings (1998) argued, racism is "so enmeshed in the fabric or our social order, it appears both normal and natural to people in this culture" (p. 11). Sadly, the academic underperformance of Black boys in secondary education is viewed as both natural and normal, leading to a sense of helplessness and an orientation by some educators to adopt deficit frameworks for understanding and responding to the challenges faced

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[1] Pseudonyms are used for the research site and all participants.

by this population of students.

Within the field of education, CRT is used as a methodological, conceptual, and theoretical tool to disrupt racism and other forms of oppression in educational theory and practice (Solórzano, 1998). An essential component of Critical Race Theory that has important implications for research on the educational experiences of Black boys is the importance of counter storytelling and narrative as a methodological tool (Clandinin & Connelly, 2000; Delgado & Stefancic, 2001). Counter storytelling and the inclusion of students' voices as a mode of inquiry allow for a methodology embedded in the social realities and lived experiences of these Black boys transitioning into high school (Matsuda, 1993). As participants in the current study reflect and share their experiences within a schooling context where they are positioned as a problem (Howard, 2013), a conceptual framework and methodology focused on student voice becomes vital.

Student Voice

Students' perspectives on their schooling are often marginalized, neglected, and limited in education research. Cook-Sather (2002) stresses that student perspectives are least often consulted when creating and reforming education policy and practice, even though students are most directly affected by them. Cook-Sather's work is supported by other researchers who believe that tapping into student perspectives can empower and enhance our understanding of schooling practices (Chambers & McCready, 2011; Clark, 1995; Davies, 1982; Finders, 1997; Heshusius, 1995; Mitra & Gross, 2009; Nieto, 2002; Rodríguez & Brown, 2009; Terry, 2011; Yonezawa & Jones, 2009). As Oldfather and Dahl (1994) argue, "when students are given voice, they are able to gain a sense of epistemological empowerment: a sense of agency, and the ability to 'know' that emerges from a strong sense of the integrity of one's process of constructing meaning" (p. 132). Furthermore, scholars such as Mitra (2004) found that "student voice activities can create meaningful experiences for youth that help to meet fundamental developmental needs—especially for students who otherwise do not find meaning in their school experiences" (p. 651). In this study, Black boys attending a large majority-minority high school located in the San Francisco Bay Area shared their perspectives on a course designed to assist with their transition from middle school to high school. They also discussed the challenges that exist in their high schools that serve as barriers for their overall success. This study seeks to contribute to a growing field of scholarship that documents Black students' perspectives of their learning environments.

Methodology

This qualitative case study utilizes narrative inquiry (Clandinin & Connelly, 2000) to unpack the experiences of four Black boys in a single-sex classroom to better understand how they make sense of their transition into high school.

Research Context

Located in the ethnically, racially, and socioeconomically diverse San Francisco Bay Area, Wolverine High School's all-Black boys ninth grade "Life Skills" class stands as one example of a growing trend among community leaders and educators across the nation to develop and implement curricular initiatives aimed at supporting marginalized populations in school, particularly Black boys (Terry et al., 2014). The school has a population (n=3,800) made up of Hispanic or Latino (34%), Filipino (23%), Asian (22%), African American (8%), and White (6%) students with 40% of students being eligible for free and reduced lunch. The course, which has been taught by Mr. Graham since its inception nearly a decade ago, focuses on

engaging ninth grade Black boys in lessons that cover basic rights and liberties, as well as lessons on African and African American history and literature, including discussions about current events impacting the Black community locally and in the U.S. The course's origin can be contributed to school leaders who, feeling compelled to address the issues of poor academic performance and engagement of Black boys at Wolverine High School, asked Mr. Graham to create a course as an intervention. All incoming ninth grade Black boys are automatically enrolled in Mr. Graham's first period Life Skills course in the fall and continue into his African American Studies course in the spring of their freshman year.

As the class continues with its ninth cohort of freshman Black boys, it is important to take note of its success. As a former Wolverine High School principal notes, "The graduation class of 2014 had an improved graduation rate and the students from the class performed as well as their white counterparts on the CAHSEE [California High School Exit Exam]." Further, rates of disciplinary referrals and suspensions for Black boys at Wolverine High School have declined since the course began during the 2007-2008 academic year. Mr. Graham utilizes Margery Ginsberg and Raymond Wlodkowski's (2000) Motivational Framework for Culturally Responsive Teaching to emphasize four key supports for the students: establishing inclusion, building security, enhancing meaning, and engendering competence (Lindsey & Mabie, 2012). It is also important to note that Mr. Graham has over 30 years of teaching experience in the school district, is one of only a handful of Black teachers at Wolverine High School, and is the only teacher on the campus who is a Black man.

Participants

Four self-identified Black boys participated in the current study. All participants were enrolled in Mr. Graham's Life Skills class during their freshman year at Wolverine High School and were at least one year removed from their experience in the Life Skills class.

Bob. Bob is a junior at Wolverine High School who aspires to find a career in the music industry. As a student who commutes to the high school from a neighboring city, Bob knew very few students when he arrived on campus.

David. David is a quiet sophomore at Wolverine High School who also commutes to campus from a neighboring city. David comes from a single-parent home and he currently plays on the school's football team.

Devon. Devon is a senior at Wolverine High School. He is a sprinter on the track team and is in the process of applying for admission into college. Devon lives near the school and he also participates on the speech and debate team, for which Mr. Graham has been the coach for the past 20 years.

Smith. Smith is a senior at Wolverine High School, whose family is originally from Nigeria. Smith is also in the process of applying for admission into college.

Data Collection

The primary data source for this study were semi-structured interviews with students previously enrolled in the Life Skills class. After receiving parental consent, students were interviewed once by the researcher during a 30- to 45-minute session about their experiences in Mr. Graham's class and their experiences transitioning to Wolverine High School. This included questions about students' experiences in classes and their relationships with peers and adults at Wolverine High School. All interviews took place in a classroom at Wolverine High School not far from Mr. Graham's class. Additionally, interviews took place during students' lunch period or after school and were transcribed in their entirety.

Data Analysis

Qualitative coding techniques that included member checking and coding for recurring themes were used to analyze interviews with students from the Life Skills class (Guba & Lincoln, 1989; Creswell, 2013). All student interview data were entered into a Word document and coded thematically. The two major themes that were identified as a result of an inductive coding of student interviews (Clandinin & Connelly, 2000) were (1) demonstration of care from teachers and (2) school and life preparation.

Results and Findings

This study's findings are organized by recurring themes that were identified during the data analysis process. Moments from transcripts that served as thematic examples provided insight on the experiences of Black boys in Mr. Graham's Life Skills class and their transition into Wolverine High School more broadly. These examples are highlighted in the results and findings below. Through the analysis of themes from students' interview responses, results indicated that participants could see clear distinctions in the demonstration of care from Mr. Graham and other teachers, and that participants framed their experiences in the Life Skills class as contributing to their preparation for Wolverine High School and for life more generally.

Demonstration of Care from Teachers

All participants in the study made it a point to comment on the way they felt a sense of caring (or lack thereof) by teachers a Wolverine High School. Students reported many of their teachers seemed to be simply going through the motions in their course instruction, with three of the four participants insinuating that teachers were satisfied "just collecting a paycheck." For example, David notes:

[The teachers] don't care. It's like they do what they have to. They don't really do anything extra. Like if you ask for help, they'll tell you to come in at lunch and then tell you the same thing that they told in class and like without trying to re-word it.

David's comments are noteworthy in that they articulate two issues that seemed to be common across participants. First, there is a sense that some teachers do not care to make an "extra" effort for students in their classes. This observation could be a major source of discouragement for students that could otherwise benefit from thoughtful engagement from teachers in their school. Also important to note about David's comments is the circumstance of him actively seeking out additional academic support and feeling like his teacher was not responsive. This contradicts and complicates prevailing narratives about school disengagement among Black boys and challenges assumptions that might allow us to ignore the issue of disengagement on the behalf of teachers.

Perhaps more disturbing than the comments about the sense of detachment students felt from their teachers as they transitioned into high school were the comments from Bob about one his teachers:

Most of these teachers are here just because they are getting paid…Like for example, my biology teacher, it doesn't seem like he cares to be honest. It just seems like he is there to teach us the basics, not really care about the other students. Not trying to get to know us and stuff like that…The first day when I walked into my biology class…it seemed like he already didn't like me to be honest because like I feel he is kind of racist, I'm not going to lie…There are four Black guys in that class and so like we all sit in the front sometimes and so I guess he got mad or something, he was like "You damn niggers!"

Bob's experience serves as a sobering reminder of the significance of race and the pervasiveness

of racism in schools today. Bob's read of the teacher on the "first day" and the subsequent racial attack suggest that Black male students like Bob may find it necessary to develop mechanisms that guard against racialized aggressions from teachers. This can create additional barriers for educators looking to engage Black boys as they transition into high school.

However, it should be noted that all participants in the student juxtaposed instances of teacher disconnection and disengagement with stories about the sense of caring that felt with Mr. Graham.

> [Mr. Graham] doesn't just like, he's not just there but he's there to help us, not even just in school but like life problems and stuff like that and he cares about the problems we're dealing with and he is always there to help us…Let's say if we look down or something like that, he would ask us, he'd pull us aside and ask us how we're feeling and stuff like that and he'd be very connected with the family, other people's families…He would call, check up on us, check up on the family.

All participants in the study talked at length about how Mr. Graham was different than other teachers at Wolverine High School and how Mr. Graham's concern for students' academic and personal well-being manifested in the Life Skills class. Students reported that Mr. Graham's concern, coupled with high expectations, made them feel cared for as they transitioned into high school. Devon states:

> My experience here was interesting in the sense that Mr. Graham was probably the only teacher that didn't let me get away with doing stuff, cause he would just catch the BS instantly and not let it fly. Whereas a lot of teachers would just let you get by, as long as you're not bothering them they just want to get their check. Just let you get by as long as they can get that 54 minute period over, like I use to get over on a lot of teachers but it's cause I don't think they had that drive to really want to be there anymore because they were tenured at that point. So they were just like well if you don't want to be here, I'm not going to keep you here.

Again, echoing this sentiment that many teachers do not really care about students' well-being, Devon adds that Mr. Graham's high expectations of students and his unwillingness to deal with "BS" served as a powerful motivator for students to respect and listen to Mr. Graham, specifically in the Life Skills class.

School and Life Preparation

In addition to the theme of teachers demonstrating care (or lack thereof) to transitioning Black boys at Wolverine High School, participants also commented on the ways they felt the Life Skill class contributed to their preparation for high school and for life. When asked about the content of the Life Skills class, Bob notes that students would learn about African American history. He adds, "We would learn like how to write, like format of writing and how to work on, how to express our feelings on paper…it would be just whatever is on our mind or just to express ourselves." Three of the study's participants commented specifically on aspects of the class that resonated with them even after leaving the course. Noting the classroom visitors that talked about attending college, the reading of Malcolm X's autobiography, researching African kings, and discussing current events, participants described how much they enjoyed the content of the Life Skills class, in addition to how much they could tell that Mr. Graham cared about the students and the subject matter. In response to an interview question about how (if at all) the Life Skills course contributed to his own academic success, Bob states:

> Mr. Graham taught me how to like stay in school and stuff like that and I started taking class more serious, by like doing my homework more often, turning it in, asking for help

and like I usually don't even ask for help to be honest…[Mr. Graham] would help us on Wednesdays. He would get all the students to bring their work to first period for all the periods and all the TAs and him would help us.

Bob highlights two noteworthy components of the Life Skills class in his statement. First is that Mr. Graham's practice of allowing students to complete some of their work from other classes was valued. Other participants in the study noted how this work time on Wednesdays became helpful during their first year at Wolverine High School, since they were able to have structured work time and assistance from Mr. Graham and his teaching assistants. Also noteworthy is Bob's identification of Mr. Graham as a motivator to "stay in school" and to take his studies more seriously. Given Bob's negative experience with some of his teachers, the significance of Mr. Graham's motivation for academic success should not be understated.

Another finding that emerged from the interviews was the developing social critique students articulated that was connected to lessons in the Life Skills class. For example, Smith notes:

I learned that no matter what you do, no matter what you do to try to change the stereotype there will still be people that think [negatively] of you and it made me learn that when I go out, I have to realize that no matter what I do people will still think of me in this way, as a stereotypical African American male. No matter what happens, you can't change that because of the past. So that changed my perspective in that I need to, I shouldn't be ignorant. I should know that not everyone likes me and people will always have this feeling of me.

All participants in the study highlighted how the Life Skills class caused them to look at their experiences in school and in the world differently. Students discussed how new information about social inequities and historical movements helped them more easily identify systems of oppression, while also providing scripts and strategies to respond to injustices.

As a result of this shared experience, participants noted a sense of community with their peers. Devon notes:

When your peers are able to help you academically, cause academics aren't everything so though you may be academically stronger than someone else, they can help you with like learning more socially, like being more aware of your surroundings, being exposed to things you wouldn't otherwise be exposed to. I'll keep it real, I didn't really kick it with a lot of Black people during like my elementary, middle school years. I knew them, but like I never really kicked it with them so being in that class now you were able to see all of people and you're able to know them and kick it with them kind of like help them out through things too, in the same way they can help you out with things.

While a sense of community was articulated by all participants in the study, students also acknowledged that not all students in the Life Skills class bought into its lessons, noting that some of their peers failed to "listen to Mr. Graham," ending up in trouble or leaving Wolverine High School prematurely.

Conclusion

Interviews with four Black male students at Wolverine High School about their experiences in Mr. Graham's Life Skills class as they transitioned into high school offer important lessons for educational researchers and practitioners. First, Life Skills students were able to find important sources of support in Mr. Graham that were used to supplement weak relationships with other adults at Wolverine High School. The fact that Mr. Graham's identity

and curriculum aligned with the racial identity and experiences of freshman students seems to be a key contributor to students' high assessment of their experiences in the course. However, the ethic of care demonstrated by Mr. Graham seems to be a more significant factor in students' comments, as opposed to the curriculum or his racial identity. In this way, findings from this study reinforce the work of scholars like Duncan-Andrade (2009) who delineates for educators working with marginalized student populations the difference between good hope, or what he refers to as *critical hope*, and bad hope, or *false hope*. Additionally, findings from this study also support efforts to create spaces for boys of color, who have qualitatively different schooling experiences (as seen in this study), but need access to thoughtful and critical curriculum that affords students opportunities to build relationships with teachers and peers, and heal from harmful classrooms – what Dumas (2014) calls sites of "black suffering." While additional questions about the effectiveness of interventions like the one described in this study remain, scholars should seek out opportunities to investigate similar types of spaces, hopefully tapping into a larger number of students' voices to shed light on important efforts to improve the quality of transition for Black boys moving from middle school into high school.

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Subjective Discipline and the Social Control of Black Girls in Pipeline Schools

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ABSTRACT: Using an intersectional feminist critical race lens, we utilized the Education Longitudinal Study (2002) data comparing tenth grade African American girls to White girls, analyzing whether the student was ever held back, teacher reports of problem behaviors in classrooms, and whether the student did not graduate from high school in the four years following her tenth-grade year, to determine if subjective discipline and social control of Black girls leads to eventual school dropout. Essentially, we asked, are African American girls who are retained and/or subjected to other more informal push-out policies more apt to leave school on their own? The findings confirmed, first, that African American girls were at much higher risk of both grade retention and informal reports of discipline problems from teachers, even after controlling for family factors, school quality, and teacher quality. We then confirmed that while family, school, and teacher quality factors did not explain away the much higher dropout rate of African American girls, the differences in history of grade retention and teacher discipline completed equated the two groups. These findings provide support for the "push-out" explanation put forward in the literature.

Keywords: School pushout, subjective discipline, social control, Black girls, pipeline schools, intersectionality

Overview and Related Research
"There would be no lynching if it did not start in the classroom" (Woodson, 1933, p. 8).

The U.S. education system has a history of institutional racism, glaringly revealed in differential discipline favoring White students and disadvantaging Black and Brown students (Black, 2016). What is not quite as clear is how this differential system of discipline is meted out in very gendered terms. In recent years, educational researchers have explicated the problem of the school-to-prison pipeline and its impact on urban populations, specifically its negative effects on African American boys. More recently, the African American Policy Forum and scholars like Kimberle Crenshaw and Monique Morris have raised the call to include African American girls in this conversation, because their social exclusion and pushout from schools is being minimized and ignored by gendered policies and programs that focus primarily on boys. According to Morris (2016), "While boys receive more than two out of three suspensions, Black girls are suspended at higher rates (12%) than girls of any other race or ethnicity and most boys" (p. 13). In fact, Morris argues that the treatment of African American girls in schools is far more insidious and subversive, with much disciplining of and control over appearance, often done in informal ways, but with the end result being the punishment of Black girl aesthetics, such as natural hair, dreadlocks, or braids, being deemed as "disruptive."

According to the U.S. Department of Education Office for Civil Rights (2012), African

American students are 3.5 times more likely to be suspended or expelled. Although they make up only 18% of the overall student population, African American students make up 46% of those students suspended more than one time. One in four African American students are suspended at least once compared to one in 11 White students (U.S. Department of Education Office for Civil Rights, 2012). In the 60 years post *Brown v. Board of Education*, we find ourselves with a re-segregated educational system where students of color experience structural inequalities (Lee, 2003), and we argue that African American girls are disproportionately disadvantaged by such segregation. Sharma, Joyner, and Osment (2014) found that such segregation and racial isolation results in the decreased performance of minority students on standardized English and mathematics examinations, which serves to reinforce the stereotypical ideology that Blacks are less intelligent than Whites (Penner & Saperstein, 2013; Steele and Aronson, 1995) and subsequently, that Black students are unable to perform as well as Whites because of cultural deficits (Spencer, 2012) or inherent intellectual ineptitude (Goff, Jackson, Di Leone, Culotta, & DiTomasso, 2014). Couple this with differential discipline and punitive policies, and the results are beyond disastrous.

The perception of Blackness as deviant has severe implications for education, and school discipline is perhaps the area where this is most glaring. Students of color are referred for more arbitrary and subjective concerns and for less serious offences that may not result in a referral for a White student. The *perception* of a threat (by Black students) is an issue (for White teachers). What is perceived as a threat when committed by a Black student is commonly not considered a threat when committed by a White student (O'Connor & Fernandez, 2006, p. 9). Zion and Blanchett (2011) identify a second latent function of education: social control. The function of education as a mechanism of social control is manifest in the utilization of disciplinary techniques to manage and control students identified as disruptive (Skiba, Michael, Nardo, & Peterson, 2002).

In an effort to ensure safety and control, particularly "post-Columbine," the infamous 1999 massacre of 13 high school students in Littleton, Colorado at the hands of two of their classmates (Lickel, Schmader, & Hamilton, 2003), disciplinary policies fashioned after the "zero tolerance" model have become standard (Lewis, Butler, Bonner, Fred, & Joubert, 2010). Most African American girls attend what could be considered as urban or "Apartheid" schools (Orfield & Frankenberg, 2004). Such schools are subject to zero tolerance policies, police intervention and surveillance, and strict discipline policies. Such schools are also most often located in urban environments, employ underprepared teachers, lack resources, and often operate from deficit mindsets, and low expectations and academic rigor (Milner, 2013). In these Apartheid schools, students are viewed as criminals or potential criminals; their lack of academic success is then blamed on them, their culture, or their families, as opposed to a system stacked against them. According to the African American Policy Forum (2015), "at-risk young women describe zero-tolerance schools as chaotic environments in which discipline is prioritized over educational attainment" (pp.12-13). What we intend to make clear in this paper is that what African American girls face specifically is a vicious circle where low expectations and implicit bias leads to school push out for many. Colorblind ideologies, coupled with the absence of analysis of White hegemony and its corresponding social, linguistic, and behavioral standards and norms, exacerbate this current reality.

Another discriminatory practice involves "subjective discipline"—imparted by teachers and motivated by implicit bias. For example, the concept of "disrespect" is inherently subjective. In fact, "disrespect" is in the eye of the beholder and difficult to prove. If one student receives no

consequences for a conflict, when another student receives all of the consequences, implicit bias may play a role. Previous research suggests that not only are disciplinary techniques negatively associated with educational outcomes, but may also target students of color, whether explicitly or implicitly (Casella, 2003; Monroe, 2005; Perry & Morris, 2014).

The literature is clear that Black and Brown students, particularly males, are subjected to differential discipline. Recent literature reveals how Black girls are uniquely impacted: what types of behavioral sanctions are leveled against Black girls, and how the disciplining of Black girls pertains to their non-adherence to traditional female (and white) gender norms (Arango, 2014; Blake, Butler, Lewis, & Darensbourg, 2010; George, 2015; Morris, & Perry, 2017; Morris, 2007; Slate, Gray, & Jones, 2016; Wun, 2016). What is less clear is the scope of this problem nationally. The gap in this research lies in the paucity of national longitudinal data analysis to inform scholars and practitioners how serious of an issue school pushout is for Black girls. With this paper, we attempt to fill this gap.

In this study, we will examine whether discipline techniques that target African American girls, such as suspensions and informal pushouts, lead these girls to eventually drop out of school. We know that 7% of African American girls drop out, compared to 3.8% of White girls (Morris, 2016). Thus, we seek to determine whether the over-disciplining of African American girls leads to eventual school dropout. Are African American girls who are suspended and subjected to other more informal pushout policies more apt to leave school on their own?

Theoretical Context
"It's not who you attend school with but who controls the school you attend."—Nikki Giovanni

We investigate this topic through an intersectional feminist critical race lens (Crenshaw, 1993), paying particular attention to the intersectional identities of African American girls and their unique experiences in schools. According to Morris (2016), "Black girls are routinely expected to seamlessly reconcile their status as Black *and* female *and* poor, a status that has left them with a mark of double jeopardy that fuels intense discrimination and personal vulnerability" (p. 23). Our intersectional feminist critical race lens necessitates a critique of the institutions that ignore, seek to correct, discipline, and criminalize African American girl aesthetics and identities. This lens also allows for the interrogation of social, educational, and political factors that impact this current reality (Chapman, 2007), the end goal of which is social justice (DeCuir & Dixson, 2004). Our intersectional feminist critical race lens seeks to determine how oppression is perpetuated, for the purposes of undermining all forms of bias within systems and institutions. Dismantling White (and other forms of) privilege is a necessary component of this mission.

Methods
Data Source
These data come from the second follow-up of the Education Longitudinal Study of 2002 (ELS, 2002). It is the most recent data collection from the National Center of Education Statistics (NCES) concerning high school level students. NCES compiled a list of all schools in the United States that included a 10th grade and selected a random sample of 800 of these schools to participate in the study. From these schools, up to thirty 10th graders were selected at random to be participants for the full study. We used the public-use data file for all analyses.

Sample Described

The full data set consisted of 16,197 students, of which 7,717 were female. This sample was again reduced to only those students identified exclusively as Black/African American or White. In this final analytic sample of only African American or White girls, the total sample size was 5,611, of which 21.8% of the sample were African American and the remaining 78.2% were White.

These girls ranged–from 15 to 19 years of age, with the mean age of 16.4 years (SD = 0.55). Fifty-eight percent of the analytic sample lived with both mother and father. Thirteen percent of the families reported an annual family income of $20,000 or less (poverty level for a family of four in 2002), while 15.9% of the families reported an annual family income of more than $100,000 a year.

Measures

The primary predictor for this study was whether the student was Black/African American or White. This dichotomous measure had an overall distribution for this sample of 21.8% Black/African American and 78.2% White. This study examined three outcome measures - whether the child had been held back (reported by the parent), a composite of teacher reports of student disruption, and the school's record of whether the student had completed high school.

The covariates considered in this study fell into three domains: (1) parent/family covariates, (2) school covariates, and (3) teacher covariates. For parent and family characteristics, we examined a composite of the parent's own report of problem behaviors and a standardized composite of various components of a family's socioeconomic status. The focus of school characteristics was a composite of items measuring school problems, such as the amount of trash observed, the noise level, observable disrepair of the building, and graffiti in and outside the classroom and the school. The focus on teacher characteristics concerned the quality of the teacher who made the report of problem behaviors about the students: (1) education level, (2) years' experience, (3) the amount of training in his/her field, and (4) their response to an item asking, "If you were starting over, would you be a teacher again?" to measure more difficulty or disillusionment with teaching.

Analyses

For both outcomes observed in 10th grade, we examined first the overall comparison between African American and White girls, then added alternate explanations in the following order: parent report of school problems, socioeconomic status, school quality problems as reported by an external observer, and teacher quality elements. These models were adjusted to retain only significant covariates. In each stage, we focused on the significance of the change in variance explained and on the amount of change observed in the Black-versus-White comparison of the outcome.

For the final outcome of high school graduation, following the overall comparison of African American and White girls' rates, we added the full set of covariate measures, then added whether or not the student had been retained a grade up through 10th-grade, and finally added the teachers' report of problem behaviors at school. In each stage, we were interested in both the amount of reduction in the difference in rates between African American and White girls, as well as the impact of the additional components on the overall model.

Results Concerning Push Out at the High School Level

For this cohort of students, we were interested in the experiences of the girls in their 10th grade classroom, as well as their history of being held back in school. We used the second

follow-up file to consider the impact of these factors, as well as the covariates, with respect to the outcome of a student not having completed high school. We address each area separately.

Student Retention History through Tenth Grade

As described above, we analyzed differences by race in whether the student was ever held back after taking other explanatory factors into account. Figure 1 shows the difference translated from the logistic regression coefficient back to the percent held back for each group, adjusted at each stage by other covariates in the analysis.

Figure 1. Results of sequential logistic regression analyses testing the difference between the estimated likelihood of being held back for Black/African American and White girls.
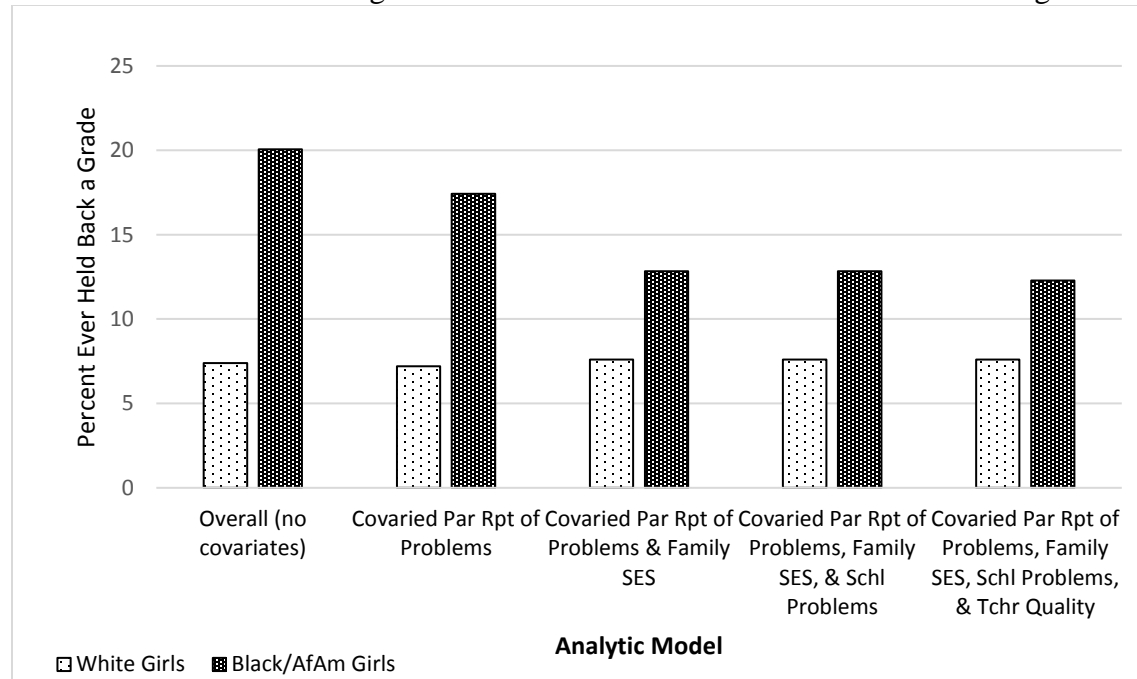
Being held back a grade was a strong predictor of eventual dropping out of school and, as such, is a historical indicator of the kinds of "push-out" forces experienced by these girls. These results demonstrate that African American girls were much more likely to be held back a grade compared to White girls. Even at the most reduced level of comparison (Model 5), African American girls were more than twice as likely as White girls to have been held back at least once by the time they reached 10th grade.

Teacher Reports of Problem Behaviors

As described in the methods section above, the overall difference was examined relative to the addition of other explanatory factors. As each variable in the analysis was significantly related to the outcome, the focus for these results rests on the comparison of Black/ African American and White girls. Figure 2 shows the pattern of these differences.

Figure 2. Results of hierarchical regression analyses testing the difference between teacher reports of problem behavior for Black/African American and White girls.
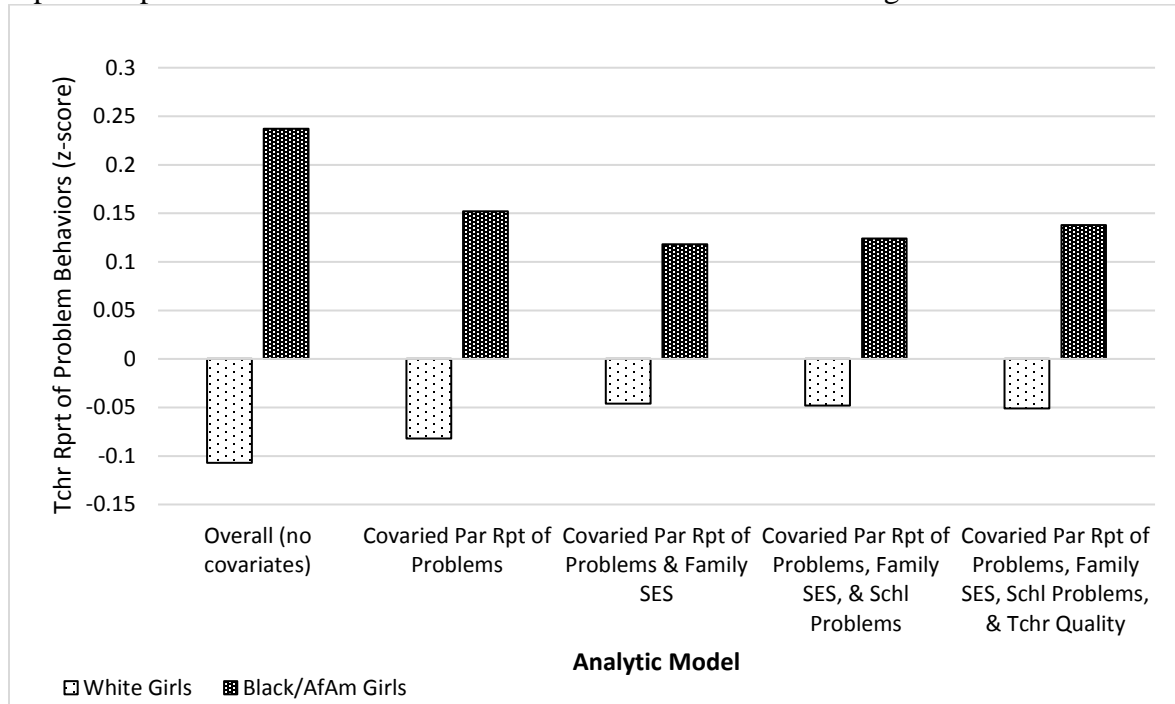
The central observation in these results is the striking difference in level of problem behaviors reported by teachers between these two groups of girls. Even after controlling for the parents' report of the same behaviors, the teachers still report much higher problem levels for African American girls in their classrooms. In addition, of the five areas of covariates, both school problems and teacher quality did not have the theorized impact of an alternate explanation – both sets of measures instead increased the difference in problem behaviors reported by teachers for these two groups of girls.

The other element of interest in this comparison was whether the difference in teacher reports of problem behavior might also differ based on the ethnicity of the teacher. In this analysis, the teacher's racial group was reduced to Black/African American, White, or Other. This analysis did reveal a significant interaction between the race of the teacher and that of the student ($F_{(1,4001)} = 5.91$, $p < .05$). The adjusted means for the groups are shown in Figure 3. In this analysis, the means have also been adjusted for the significant covariates in the last model provided above.

While teachers' reports of White girls' problem behavior were quite similar, there were differences in the shift reported for African American girls' problems, with Black/ African American teachers giving a significantly lower report than either White teachers or teachers of other races. However, there was still a sizeable difference, with teachers reporting significantly higher problem levels for African American girls compared to White girls, even after adjusting for alternate explanations.

Figure 3. Results testing the difference between teachers of different ethnic backgrounds' reports of problem behavior for Black/African American and White girls.
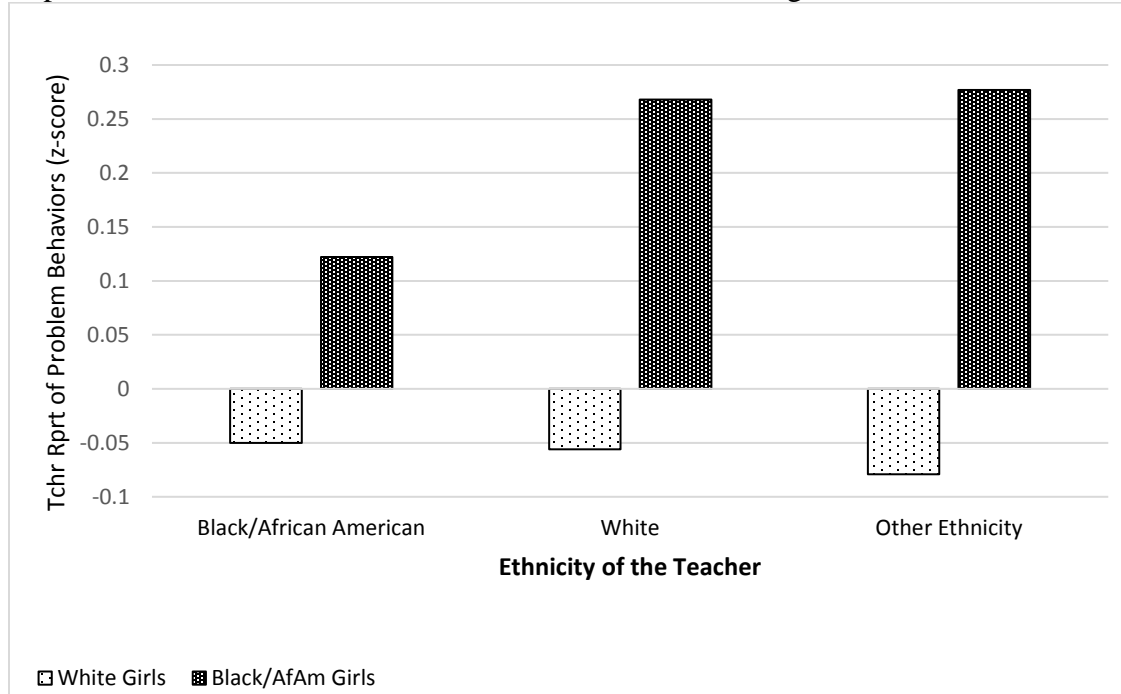
Differences in Failure to Complete High School

As described in the methods section, the second follow-up of the ELS:2002 data set included an indication as to whether the student had completed high school in the four years following their 10th grade year. We used the outcomes from the previous two analyses, combined with the covariates listed in the final model, to compare students' completion rates for high school within four years of 10th grade. For these analyses, we used the final model covariates from the previous analysis as the first added layer, the student's history of retention added to these as the second, and teachers' reports of problem behaviors as the third, giving only four models instead of five.

With no other factors under consideration, African American girls failed to graduate from high school within four years of their 10th grade year at a rate that was almost three times higher than that experienced by White girls. The inclusion of background factors reduced the difference to about double the rate ($p < .001$). However, controlling for whether the girl had been held back up through tenth grade and then teachers' reports of problem behavior reduced the difference between these two groups to insignificance ($p = .978$). This finding indicates that the pattern of characteristics that contribute to African American girls being held back more, and experiencing higher levels of teacher-reported problems in their 10th grade classrooms completely accounted for an overall 300% difference in these students dropping out of high school. It is, in essence, the definition of being pushed out of school.

Figure 4. Results of sequential logistic regression analyses testing the difference between the estimated likelihood of not graduating from high school within four years of tenth grade for Black/African American and White girls.
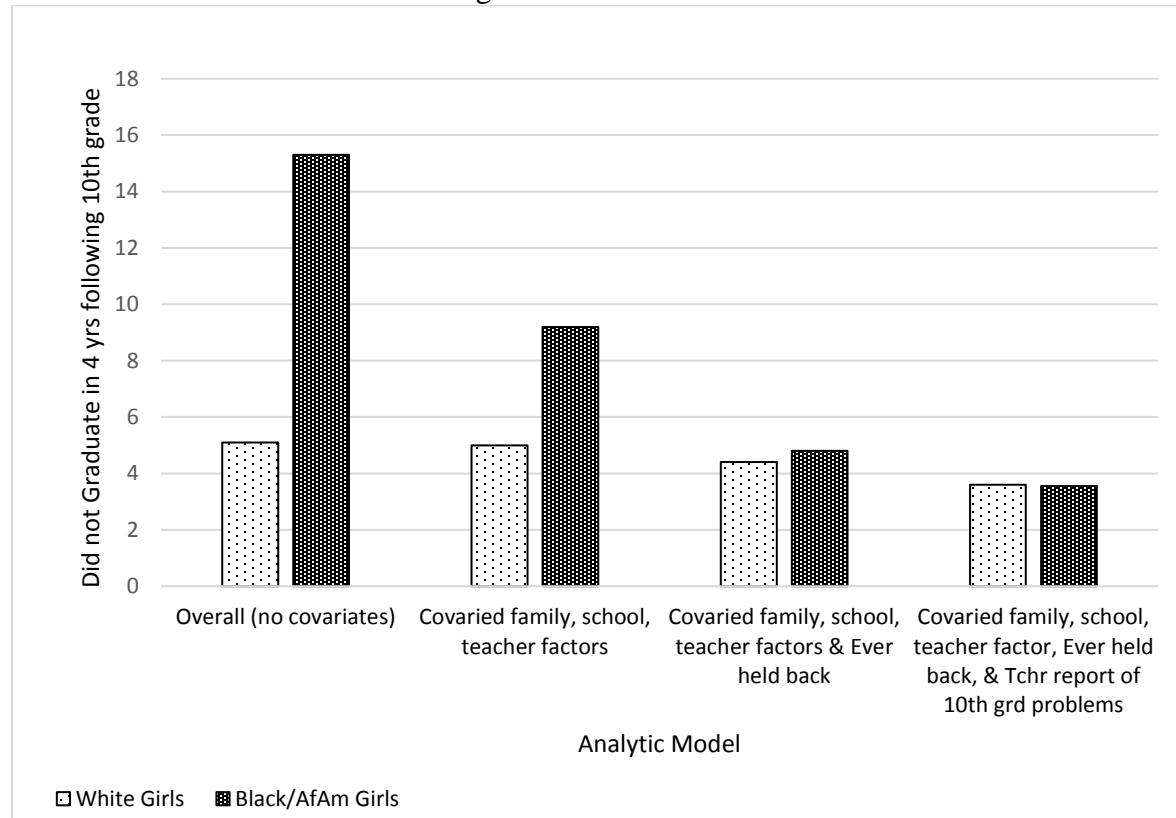
Discussion and Conclusions

As the literature suggests, these analyses confirm that Black girls have a significantly higher risk of being subjected to differential disciplining and eventual school pushout than do their White counterparts. In sum, Black girls failed to graduate from high school within four years of their 10th grade year at a rate that was almost three times higher than White girls. The subversive pattern of teacher behaviors and school policies that contribute to Black girls being held back more, and experiencing higher levels of teacher-reported problems in their 10th-grade classrooms, completely accounted for an overall 300% difference in Black girls being pushed out of high school.

These disturbing results must serve as a call for policymakers to rethink gendered policies and programs that focus primarily on boys and minimize the social exclusion and pushout from schools that is the reality for all too many Black girls in schools today. Likewise, these results must be used as guidance in teacher education programs. Teacher candidates, most of whom are White and female, must be challenged to confront their own implicit race-based biases before they are allowed to play out in schools. Finally, these results must be used in professional development sessions for in-service teachers. Current hegemonic teaching and curricular practices must be dismantled so that subjective misinterpretations of critical cultural, linguistic, and behavioral patterns may be revealed. We hereby call for the inclusion of feminist intersectionality and culturally responsive pedagogical practices in preservice teacher education training and in-service professional development.

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The Impact of Adapting a General Professional Development Framework to the Constraints of In-Service Professional Development on the Next Generation Science Standards in Urban Settings

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ABSTRACT: Urban school districts face a dilemma in providing professional development support for teachers in transition to the Next Generation Science Standards (NGSS). Districts need to maximize the quality and amount of professional development within practical funding constraints. In this paper, we discuss preliminary results from a researcher-practitioner partnership between Northwestern University and the Chicago Public Schools. We explore a model for quarterly NGSS professional development for urban middle school science teachers that spans three years. The workshop inquiry experiences are aligned to areas of research excellence at Northwestern. Teachers in twenty-three of the schools responded to a survey on the impact of formal and informal learning experiences on changes in teaching practice. We also analyzed the growth in student-rated inquiry-based science teaching practices. The results indicate that the professional development program had a significant direct impact on teaching practices as well as indirect impact on the teaching practices of other teachers at the school.

Keywords: professional development, science teaching, NGSS, middle schools

Urban school districts face a dilemma in providing professional development support for teachers in transition to the Next Generation Science Standards (NGSS). On the one hand, supporting shifts in teaching practice requires significant investment in professional development that is (1) long in duration, both in terms of total contact hours and in time span, and (2) involves the collective participation of school staff (Desimone & Garet, 2015; Garet, Porter, Desimone, Birman, & Yoon, 2001). Prior research has also shown that the direct benefits of professional development can also provide indirect benefits when teachers share what they have learned in professional development with other teachers at their school (Penuel, Sun, Frank, & Gallagher, 2012). On the other hand, frequent teacher turnover in urban settings creates barriers to schools' ability to reap the benefits of their professional development investment. Urban schools need to continually invest in new teachers. For example, less than half of Chicago teachers stay at the same school for more than four years (Allensworth, Ponisciak, & Mazzeo, 2009). Turnover is particularly acute for teachers in high poverty, low performing schools. This instability of the teaching corps tends to decrease curriculum coherence and the quality of instruction (Bryk, Sebring, Allensworth, Luppescu, & Easton, 2010). In addition, the small size of many schools in urban settings often means that there is only one teacher at the school in a given subject area, thus reducing the benefits that come from collective participation. In this paper, we discuss preliminary results from a researcher-practice partnership (RPP) between Northwestern

University and a network of Chicago Public Schools (CPS) elementary schools in which we are exploring a model for Next Generation Science Standards (NGSS) professional development that is uniquely adapted to an urban context.

Conceptual Framework

We need more information about specific aspects of [professional development] that are important in different contexts, in order to form a better understanding of why some [professional development] works and some doesn't. (Desimone & Garet, 2015, p. 260)

This work is anchored in the literature on teacher professional development. In a recent review of professional development research, Desimone and Garet (2015) present a conceptual framework highlighting key features for designing professional development to positively impact teacher knowledge and changes in inquiry-based teaching. In addition to the two features listed above, high quality professional development also (3) is content focused, (4) involves active learning, and (5) is coherent with the school goals, teacher knowledge, the needs of students, and local policies. The content of professional development in science includes the disciplinary core ideas, science practices, and cross-cutting concepts that comprise the NGSS (NGSS Lead States, 2013). The active learning dimension incorporates four components: planning instruction, giving professional presentations, peer observation, and collaborative discussion. The latter two activities are often associated with professional community. The Desimone and Garet conceptual framework for professional development aggregates the prevalence of these four components of active learning into a single active learning scale. This active learning scale aggregates both individual and group activities. In addition, this active learning scale does not make a distinction between teachers collaborating with colleagues in their school or teachers collaborating with peers from other schools participating in the professional development.

Parise and Spillane (2010) extended the findings of Garet et al. (2001) by investigating how changes in teaching practice are differentially influenced by the indicators of professional community that are related to the Desimone and Garet (2015)'s active learning scale. Parise and Spillane (2010) labeled these indicators of professional community as on-the-job learning opportunities (i.e., peer observation, collaborative discussion, and advice seeking). They compared these indicators of professional community to formal learning opportunities, including professional development workshops, coursework, and network participation. Their study investigated these indicators for elementary math and English teaching in an urban setting, but not for science teachers. Of the various types of formal learning opportunities, content-specific professional development workshops significantly predicted self-reported changes in teaching practices, which is consistent with Garet et al. (2001). In contrast to Garet et al. (2001), Parise and Spillane (2010) found that a subset of the indicators of professional community directly predicted changes in teaching practices, specifically collaborative discussion and advice seeking. Likewise, McGee (2016) replicated the findings from Parise and Spillane, but in the discipline of science. He, too, found that collaborative discussion and advice seeking predicted self-reported changes in high school science teaching practice.

In addition to serving as a framework for the design of professional development, Desimone (2009) also presents the framework as a means to inform research on professional development. By relating the features of specific professional development programs to the framework, it becomes possible to aggregate the results of research across programs to draw

conclusions on the effects of the various components on teacher knowledge and practice. In order to frame the design of our professional development program, we conducted an analysis of a small sample of impact studies on NGSS professional development programs. We used three sources, which resulted in eight studies. There is one study on science professional development cited in Desimone and Garet (2015); (see Penuel, Gallagher, & Moorthy, 2011). We became familiar with two programs presented at the 2016 and 2017 National Association of Researchers of Science Teaching annual meetings (see Reiser, Michaels, Dyer, Edwards, & McGill, 2016; Tuttle et al., 2016). Lastly, we used the search term "impact of NGSS professional development" in Google Scholar and limited the search to 2016-2017. An examination of the first two result pages yielded five more studies (see Capraro et al., 2016; Lotter et al., 2016; Minor, Desimone, Lee, & Hochberg, 2016; Taylor, Roth, Wilson, Stuhlsatz, & Tipton, 2017; Yoon et al., 2016). We characterized these studies according the Desimone and Garet framework (see Table 1).

Table 1: Characterization of a sample of science professional development programs by the dimensions of the Desimone and Garet framework

Study	Duration	Content Focus	Coherence	Active Learning	Collective Participation
Capraro	60 hrs/year for 3 years	Measurement, Math problem solving, motion and energy.	Focused on district needs	Design PBL modules	75 teachers from 3 high schools
Lotter	82 hrs/year	Energy, genetics, astronomy, geology	Locally developed units	Engage in inquiry lesson, practice teach inquiry lessons, group reflection	Statewide recruitment Teachers signed up individually
Minor	34 hrs/year for 2 years	Content related to one unit per grade level	Each unit aligned to district scope and sequence	Engage in inquiry lessons, collaborative discussion	Not described
Penuel	112 hrs	Big ideas in Earth Science	Aligned to district needs	Plan for instruction, collaborative discussion	Grade level teams from one district
Reiser	112 hrs	3-dimensional learning	Alignment to NGSS	Engage in inquiry lessons, Examine video cases of teaching practice	Teachers across a state were selected by local districts to participate locally
Taylor	88.5 hrs	4th grade: Earth processes, ecosystems 5th grade: Climate, water cycle	Aligned to state standards	Examine videos of others and own practice, design a unit	School teams across midrange districts in CO
Tuttle	80 hrs/year	One discipline per grade band	Aligned to NGSS	Engage in inquiry lessons, plan instruction	Recruited individually from an urban district

				10 teachers from 7 schools in a metropolitan area
Yoon	40 hrs/year for two years	5 biology units	Focused on Complex systems	Engage in units, plan for instruction

A core feature of the framework is engaging teachers in professional development of sustained *duration*. While research does not point to specific guidelines for the length of professional development, Desimone and Garet (2015) have found that a minimum of 20 hours of professional development is needed to positively impact complex changes in teaching practice, such as inquiry-based science instruction. Amongst the sample programs reviewed, all of them provide more than 20 hours of professional development per year, with the minimum providing 34 hours in one year (Minor et al., 2016) and the maximum providing 112 hours in one year (Penuel et al., 2011; Reiser et al., 2016). Most of the sample programs provided more than 50 hours of professional development per year for multiple years.

Professional development should focus on specific *content* and be *coherent* with the needs of teachers and school districts. All of the sample programs focused on science content. Three of the sample programs indicated that they were working with specific school districts. Of those three, two indicated that the choice of science content was made in conjunction with the school district (Capraro et al., 2016; Penuel et al., 2011). Only one of those three programs indicated that the participating schools served primarily low-income students (Capraro et al., 2016). Of the programs that recruited teachers by region or statewide, only one provided a rationale for the selection of specific content, which was based on the goal of promoting systems thinking in biology (Yoon et al., 2016). Since the program recruited regionally, the teachers who joined presumably felt that the systems thinking content was coherent with their own goals. The other programs aligned their content to state or national standards.

The *collective participation* of school teams affords opportunities for teachers to more easily benefit from collaboration around the implementation of what was learned in the professional development. Only three projects specifically mentioned that teachers were recruited as school teams to participate in the workshops (Capraro et al., 2016; Penuel et al., 2011; Taylor et al., 2017). In the cases of Capraro et al. (2016) and Penuel et al. (2011), the professional development was conducted in conjunction with specific school districts. While not explicitly mentioned, the size of the teacher population and participation by school teams implies that teachers in these two projects were expected to participate in the professional development. All of the other programs seemed to recruit teachers on a voluntary basis, which means they are more likely to be actively engaged and reap the benefits of the program since they chose to participate.

The modes of engaging teachers in *active learning* varied. Some programs provided teachers with instructional materials. These programs prepared teachers by having them engage in the activities and then plan for how they would implement those activities in their own classroom (Lotter et al., 2016; Minor et al., 2016; Penuel & Gallagher, 2009; Yoon et al., 2016). Other programs engaged teachers in lesson/unit development (Capraro et al., 2016; Penuel & Gallagher, 2009; Tuttle et al., 2016). A handful of programs engaged teachers in reflection on videos of science teaching practices (Reiser et al., 2016; Taylor et al., 2017). In general, professional development programs, such as these, influence teachers' knowledge and skills, which in turn influence teaching practices (Desimone, 2009).

Professional Development Needs of Urban Districts

Desimone and Garet (2015) caution the field that the professional development needs of urban districts provide unique challenges for their framework. The high turnover of teachers and principals in urban settings creates challenges for both implementing and conducting research on professional development programs in urban context. Of the sample of recent studies we reviewed on impact of NGSS professional development programs, only one specifically targeted a low-income context (Capraro et al., 2016). The program had unusually high teacher retention, with most of the sample of 75 teachers across three high schools completing the three-year program. However, the researchers had to drop one-fourth of the student sample since they were not in the same high school for the three-year study. In their section on the challenges of urban professional, Desimone and Garet (2015) did not cite any studies on professional development in urban settings. We need to find ways to design, implement, and conduct research on professional development programs that do not ignore our most vulnerable students.

NU Leadership Academy Professional Development Model

In our CPS context, high teacher turnover, the small size of neighborhood schools, and the fiscal crisis in IL create barriers to realizing the duration, coherence, and collective participation that is consistent with other science professional development programs, as represented by the sample programs reviewed in this paper. All of the programs reviewed here included a summer professional development experience. The cost to CPS for summer stipends alone for the targeted network of schools would be over $100,000. On average, about $20,000 of that investment would be lost at the end of each year when one-fifth of the teachers leave the schools. In addition, anecdotal conversations with our teachers indicate that many of them use the summer to decompress from the intensity of their work environment and refuse to participate in summer professional development. The timing and duration of the workshop experiences need to provide a sustainable model for urban districts. Our professional development includes quarterly one-day, seven-hour workshops during school days. Each participating school is responsible for funding the substitute teacher. The combination of reducing the number of hours and shifting of costs from stipends to subs significantly reduces the costs for the district in comparison to a summer program. If CPS feels that the model is successful, it could easily be adapted to fit the context of the ongoing quarterly in-service professional development days, which would reduce the costs even further. At 28 contact hours per year, our program is above the 20-hour benchmark recommended by Desimone and Garet (2015), but 20% below the shortest duration program reviewed above.

Frequent teacher turnover also creates barriers to maintain coherence across years of a professional development program. Several of the programs reviewed here are multi-year programs that are cumulative. Those programs seemed to benefit from settings with a stable cadre of teachers or perhaps, the voluntary nature of the professional development attracts teachers who are more likely to stay at their schools. In a context like Chicago, a coherent program is one that can provide an accumulation of knowledge and skills for those that participate across multiple years, but each session is also stand-alone such that teachers can join the program at any point. In addition, the sustained fiscal crisis in Chicago has prevented schools from replenishing science curricula for almost a decade. Therefore, a coherent program needs to support implementation of freely available resources across the widest possible topic areas within the duration constraints. This model of coherence seems to contrast with those programs reviewed here, in which the focus was fewer topic areas in greater depth. It is likely that the middle- to upper-income districts that are typically the target of science professional

development research already have current science curricula in place and can benefit from a deep focus in a subset of the school year curriculum.

The NU Leadership Academy model is a three-year professional development program targeted at the middle school teachers in a network of thirty-three K-8 elementary schools in CPS. The student population in this network is 95% African American and 90% low-income as indicated by participation in free and reduced price lunch programs. For most of the schools in the network, there is only one middle school teacher who teaches 6th, 7th, and 8th grade science. We were able to secure funding from the Fry Foundation and the Toyota Foundation to cover the expenses of planning, implementing, and evaluating the quarterly professional development program. Through this cohort model, teachers had the opportunity to collaborate with teachers at other schools serving similar populations of students. While not from the same school, this model has the potential to provide some of the benefits of collective participation. The schools provided the funds for substitute teachers. This shared cost model also placed an incentive for principals to hold teachers accountable for implementing what was learned. We also have anecdotal evidence that some principals required teachers to attend the professional development workshops. Therefore, we ended up with a mixture of volunteers and "voluntold" participants.

We discussed three criteria for the selection and sequence of topics to maximize coherence within the duration constraints. First, the workshop topics align to the district's science scope and sequence, such that the middle school teachers participate in workshops in preparation for the NGSS performance expectations to be addressed in that quarter. Second, the workshops focus on one grade level each year, with 7th grade life science in 2015-16, 6th grade Earth science planned for 2017-18, and 8th physical science planned for 2018-19. Since there is primarily one teacher for the three grade levels, teachers who remain in their school for the three years will benefit from the accumulated experience of sixteen NGSS-related workshops over three years. For schools where there is teacher turnover, new teachers can join the series and still productively participate since each year and each workshop stands alone. In addition, we identified those teachers who consistently participated in workshops and who provided evidence that they were implementing was learned. These active participants were invited to become co-designers and co-facilitators of subsequent workshops as a way to develop capacity within the network to sustain the workshops in future years. Third, the targeted workshop topics also align to the areas of research excellence at Northwestern University. Science and engineering graduate student researchers from those areas of excellence worked with us to create research experiences for workshop participants. These research experiences provide a model for specific units that teachers can implement. In addition, these inquiry-based activities challenge the middle school teachers' understanding of core disciplinary ideas and scientific practices in NGSS.

For example, in the first quarter of the district's 7th grade life science scope and sequence, the focal disciplinary core ideas are related to *From Molecules to Organisms: Structures and Processes*. Within that broad DCI, there was one performance expectation that aligned to a neuroscience program at the university. MS-LS1-8 focuses on gathering and synthesizing information about how sensory receptors send messages to the brain for immediate behavior. Two neuroscience graduate students worked with us to design the workshop experiences. In the investigation, teachers used a web-based reaction time system to design experiments to explore factors that affect reaction time (http://cognitivefun.net/test/1). For example, teachers examined gender, dominant vs non-dominant hand, and with vs. without glasses. These experiments provided the backdrop for gathering and synthesizing information about a particular neurological disease, Guillain-Barré Syndrome. Teachers provided an explanation for how the disease would

impact messages from the sensory receptors and affect reaction time. After completing the investigation, the teachers were provided time to develop plans for implementing the investigation with their students. The workshops in subsequent quarters followed a similar pattern for topics in genetics, ecology, and evolution. While the specific science and engineering practices and cross-cutting concepts varied depending on the target performance expectations, we maintained a focus on science explanation as a core practice as well as implemented the network's overall teaching strategies related to reading-to-learn.

In this study, we sought to investigate what level of impact our professional development model had on teachers' practices as self-reported by the teachers as well as reported by the students. Desimone (2009) recommends that professional development researchers also measure changes in teacher content knowledge and pedagogical content knowledge as mediators of changes in teaching practice. However, given the variability of participation in the workshops across the thirty-three schools and the limited resources of the professional development program, it was not viable to measure changes in teacher knowledge. Desimone (2009) also recommends that professional development programs measure the impact of changes in teaching practice on student learning. At the time of this study, the state of IL was in transition to a new NGSS-aligned assessment. Therefore, there was no state student science assessment administered during the timeframe of this study. However, research similar to Parise and Spillane (2010) has shown that self-reported changes in teaching practice are predictive of improvements in student learning (Supovitz, Sirinides, & May, 2010). Therefore, this study focuses solely on the impact of participation in the professional development on teaching practices. The time frame of this study extends from the 2012-13 school year, which is the year before the schools were formed into a network, through the 2013-14 school year, when we pilot tested a version of the model, to the 2015-16 school year, which was the first year of the current model focusing on 7th grade life science topics. (The 2014-15 school year was a gap in the implementation of the model.) This study will address the following research questions:

- Does the level of participation NU Leadership Academy predict changes in teaching practice?
- Does active participation in the NU Leadership Academy provide indirect benefit to other teachers at the schools where active participants teach?

Methods

In this research, we investigate whether the level of participation in the workshops influenced teachers' changes in teaching practices, both self-reported and as reported by students. Our approach parallels the research design used by Parise and Spillane (2010). They extended the findings of Garet et al. (2001) by investigating how changes in elementary math and English teaching practice are differentially influenced by formal and informal professional learning opportunities. Parise and Spillane examined the impact of coursework, professional development and participation in outside networks. Of these various types of formal learning opportunities, only content-specific professional development significantly predicted changes in teaching practices, which is consistent with Garet et al. (2001). Parise and Spillane also examined informal professional learning opportunities (i.e., peer observation, collaborative discussion, and advice seeking) and found that the extent to which teachers engaged in collaborative discussion with colleagues and sought advice from colleagues predicted changes in teaching practice. In previous research in CPS, we replicated the findings of Parise and Spillane in the absence of any

external professional development program for high school science departments in a network of CPS high schools (McGee, 2016).

Measures

There are two sources of outcome data about teaching practices. The first source is a variation of *School Staff Questionnaire* used in Parise and Spillane (2010). The survey was administered at the end 2015-16 school year and only addresses the impact of the first year of the program on teaching practices. In addition, we gathered district data about the level of inquiry-based science teaching as reported by students on the district's *5 Essentials* questionnaire (Bryk et al., 2010). These data cover the timespan of the whole study period from 2012-13 to 2015-16.

School Staff Questionnaire. This questionnaire was adapted from Parise and Spillane (2010). The questionnaire contains the dependent variable related to self-reported changes in teaching practice. The independent variables distinguish between the level of participation in formal and informal professional learning opportunities. The formal professional learning opportunities items include participation in workshops, graduate coursework and participation in networks. By asking teachers in general about the amount of workshop participation it allows us to capture not only participation in the NU Leadership Academy workshops, but also other professional development opportunities that may be available. The level of network participation provides an indicator of the extent to which teachers may view their participation in the NU Leadership Academy as a form a collective participation.

While the NU Leadership Academy did not provide specific supports for informal professional learning at the schools, our prior research in Chicago indicates that there is a prevalence of informal learning occurring in CPS schools without specific external supports (McGee, 2016). In addition, by surveying other teachers at the schools, primarily K-5 teachers, we can address our second research question on the extent to which there are indirect benefits to other teachers at the school. The informal professional learning constructs are collaborative discussion, peer observation, and advice seeking. The questionnaire also includes control variables related to teacher demographics. The survey contains twenty-six questions, which took about 15 minutes to complete.

Changes in science teaching practices scale (dependent variable). The dependent measure is a scale comprised of eight questions about the extent to which teachers changed their science teaching practice in the past year on a seven-point scale for the following aspects of science teaching: (1) student assessment, (2) student grouping, (3) materials used, (4) topics covered, (5) teaching methods used, (6) kinds of work students do, (7) kinds of questions asked, and (8) understanding the needs of individual students in their class. The items were averaged to create the changes in science teaching practices variable, which served as a dependent variable for this study. The alpha reliability of the changes in science teaching practices variable was 0.93.

Formal professional learning opportunities (independent variables). There were three questions about formal professional learning opportunities. First is frequency of participation in science professional development workshops in the last year. The answer options for workshops are on the following scale: None (1), 1-2 sessions (2), 3-4 sessions (3), 5-7 sessions (4), and 8+sessions (5). Second is the number of science or science education courses taken in the last year. The answer options for science coursework are on the following scale: None (1), 1 class (2), 2 classes (3), 3 classes (4), and 4+ classes (5). Third is the frequency of outside network participation in the last year. The answer options for network participation are on the following scale: Never (1), 1-2 times (2), 3-4 times (3), and 5+ times (4). Each question will be used separately as an independent variable.

Informal professional learning opportunities (independent variables). There were three constructs related to the prevalence of informal professional learning opportunities: collaborative discussion, peer observation, and advice seeking. To capture the range of informal professional learning opportunities, each construct contains multiple questions that form into a scale. All of the answer options are on the following scale: Never (1), A few times per year (2), Monthly (3), Weekly (4), and Daily (5).

The collaborative discussion dimension contains seven questions that measure the self-reported frequency with which teachers engage in conversation with colleagues regarding teaching and learning: (a) what helps students learn the best, (b) development of new curriculum, (c) the goals of this school, (d) managing classroom behavior, (e) science instruction, (f) content or performance standards in science and (g) collaborative review of student work. The alpha reliability of the collaborative discussion scale as a whole was 0.87.

There were three questions about the frequency with which teachers engage in peer review and feedback. The alpha reliability of the peer observation and feedback scale was 0.80.

There was one question related to science advice seeking. Teachers were asked, "To whom do you turn for advice or information about science instruction?" Respondents could list up to ten different individuals who served as sources of advice. As an indicator of strength of the relationship with each advice giver, teachers were also asked to indicate how often they turned to each source for advice, ranging from *yearly* to *daily*. The science advice seeking measure is created by totaling the frequency with which advice was sought from all sources listed. The science advice giving construct is created by totaling the frequency with which others sought advice from a teacher.

Teacher characteristics (control variables). There were five questions about individual teacher characteristics, which were included as control variables in the analyses, including age, number of years as a teacher, number of years teaching at the current school, gender, and race.

Inquiry-based Science Instruction Scale. Each year, the 5 Essentials survey is administered to every teacher in CPS and to every middle school and high school student in CPS. The overall survey addresses a variety of school climate topics. Within the overall *5 Essentials* survey for students, there is an Inquiry-based Science Instruction scale. Students report the frequency to which they: use laboratory equipment or specimens, write lab reports, generate your own hypotheses, use evidence/data to support an argument or hypothesis, and find information from graphs and tables. The answer options are on the following scale: Never, Once or twice a semester, Once or twice a month, Once or twice a week, and Almost every day. Researchers at the University of Chicago use hierarchical linear scaling to develop a scale score for each school along the following range: Very Weak (1), Weak (2), Neutral (3), Strong (4), and Very Strong (5). The survey scale has been validated to predict growth in ACT performance (Allensworth, Correa, & Ponisciak, 2008).

Population

During the months of May and early June 2016, we used two approaches for administering the *School Staff Questionnaire.* In the first approach, all of the middle school teachers who attended the fourth quarter workshop in spring 2016 completed the survey online at the end of the workshop experience. In addition, the teachers were provided with a package of paper surveys. They were asked to distribute the surveys to the K-5 teachers at their school, collect the completed surveys, and mail the package back to the network office. For schools that did not have a teacher attend the fourth quarter workshop, packages of paper surveys were sent to the middle school teachers. They were asked to complete a survey, distribute surveys to the K-5

teachers at their schools, collect the completed surveys, and mail the packages back to the network office. The teachers who were provided with the surveys at their schools also had the option of completing the survey online.

The teachers in this study come from 23 of 33 schools in the network. A total of 93 teachers responded to the survey. Thirty (30) middle school science teachers at the 23 schools responded to the survey, reflecting that some schools have more than one middle school science teacher. Of the middle school teachers, 12 were active participants in the workshops during the 2015-16 and 18 did not actively participate in the program. These 12 active participants engaged in more than 20 hours of professional development, which is above the Desimone and Garet (2015) threshold. Sixty-three (63) K-5 teachers out of roughly 560 K-5 teachers at the 23 schools responded to the survey (12% response rate). These K-5 responses are distributed across both schools with active participants and those without active participants. The significantly higher response rate for middle school teachers versus elementary teachers reflects the fact that the intervention was targeted at middle school teachers. However, even though the K-5 teacher response rate was low overall, there are a sufficient number of respondents to allow us to draw conclusions about the indirect benefits of the middle school professional development on K-5 teachers.

Three-fourths of the teachers identified as African American (74%) and about one-fifth identified as Caucasian (22%). The remaining teachers identified as Hispanic (3%), and Other (4%). Ninety-one percent of the teachers were female (91%). The distribution of overall teaching experience is skewed towards teachers with more than 10 years of experience (63%). The median years of teaching experience was 15 years (see Table 2). However, the distribution of experience at the current school was skewed toward the lower end, with half of the teachers at their school for five years or less (51%) and the median years at the current school was 5 years. This discrepancy between overall teaching experience and experience at the current school suggests that the population reflects the high turnover rate typical of urban districts (Allensworth et al., 2009).

Table 2: Years of Teaching Experience

	At School	Total
1-5 yrs	46	12
6-10 yrs	21	21
11-15 yrs	10	21
16-20 yrs	8	22
> 20	3	15

Results

Table 3 compares the descriptive statistics between the elementary teachers and the middle school teachers for the primary dependent and independent variables included in this study. For each variable, we conducted a one-way ANOVA to test the statistical significance of the mean differences by group. The dependent variable—changes in science teaching—indicates that, on average, elementary teachers were slightly below the midpoint of 4 on the scale. Middle school teachers who were active participants were statistically more likely to have made changes to their

teaching practice at 6 on a 7-point scale (F(2,85)=12.5; p<0.0001). Non-active middle school teachers averaged at midpoint. In terms of formal professional learning opportunities, elementary teachers on average participated in 1-2 science workshops. Active middle school teachers on average attended 5-7 science workshops, whereas non-active middle school teachers on average attended 3-4 science workshops (F(2,88)=32.9; p<0.0001). In addition, active middle school teachers were more likely to report participation in outside network activities between 3 to 4 times per year on average (F(2,90)=45.3; p<0.0001). These results provide evidence that active teachers may be viewing the cohort-based workshops as an opportunity to collaborate with teachers across schools and to possibly accrue some of the benefits of collective participation.

Both active and not active middle school teachers were more likely to engage in collaborative conversations with their colleagues (about once per month), than elementary teachers (between a few times per year and once per month) (F(2,90)=4.9; p=0.01). There was no statistically significant difference between elementary and middle school teachers on the frequency of advice seeking or peer observation and feedback. However, there was a statistically significant difference in the extent to which active middle school teachers were sought out for advice by colleagues (F(2,90)=3.3; p<0.05). Active middle school teachers were more than twice as likely to be sought out for advice.

Table 3: Descriptive statistics for the dependent and independent variables

Variable	Elementary	Middle School	Middle School Active	p value
N	61	18	12	
Dependent Variable				
Changes in science teaching	3.4	4.0	6.0	0.000
Formal Learning Opportunities				
Science professional development	1.7	2.6	4.0	0.000
Science Coursework	1.2	1.2	1.4	ns
Network participation	1.4	1.9	3.5	0.000
Informal Learning Opportunities				
Conversations with colleagues	2.6	3.0	3.2	0.01
Science Advice Seeking	2.7	2.5	3.7	ns
Give Science Advice	1.0	0.4	2.3	0.04
Peer Observation and Feedback	1.1	1.4	1.3	ns

Regression Results of School Staff Questionnaire

As indicated above, this research parallels the work of Parise and Spillane (2010). Therefore, we followed their analytic strategy for modeling the impact of formal and informal learning opportunities on changes in teaching practices. We used multiple stepwise regression to independently examine the influence of formal learning and informal learning opportunities on changes in teaching practice and then examined the combined influence of both formal and informal learning opportunities. All of the variables for a given model were entered into the regression. The variable that provides the most information is added to the equation and the regression is run again to add the variable that provides the next most amount of information until the equation includes only variables that are statistically significant. Table 4 shows the

variables that were included for each of the three models. Variables that were not entered into the model are indicated as NS for not significant.

The regression model for Formal Learning Opportunities was statistically significant (F(1,82)=64.13; p<0.001; R^2 = 43%). The only statistically significant variable was the extent to which teachers participated in science professional development. The regression model for Informal Learning Opportunities was statistically significant (F(2,85)=16.33; p<0.001; R^2 = 26%). There were two statistically significant variables. The extent to which teachers engaged in conversations about science influenced teachers' science teaching practice. Consistent with prior research showing the indirect benefits of professional development, advice seeking at schools with an active middle teacher was associated with changes in science teaching practice. The combined model was statistically significant (F(3,79)=32.71; p<0.001; R^2 = 54%). Attendance at professional development and school-based conversations were statistically significant. Advice seeking at schools with an active middle school teacher was not statistically significant in the combined model. However, when accounting for variability in science professional development attendance, the conversations at schools with active middle school teachers had additional influence on changes in science teaching.

Table 4: Results of Multiple Regression of Variation of Learning Opportunities on Changes in Science Teaching Practice

Independent Variable	Changes in Science Teaching Practice		
	Formal Learning Opportunities Only	Informal Learning Opportunities Only	Full Model
Formal Professional Opportunities			
Science Professional Development	**0.52****		**0.56****
PD X Grade Level	NS		NS
Science Courses (School Year)	NS		NS
Outside Network Participation	NS		NS
Informal Professional Opportunities			
Conversations about science		**0.48****	**0.27****
Conversations @ Active School		NS	**0.16***
Advice Seeking		NS	NS
Advice Seeking @ Active School		**0.19***	NS
Peer observation and feedback		NS	NS
Teacher Controls			
Years Teaching at Current School	NS	NS	NS
Gender, Race	NS	NS	NS
R-square	43%	26%	54%
Observations	84	88	83

Significance Levels: 0.05 = *; 0.01 = **; NS = not significant

Growth of Science Teaching Practices by Level of Workshop Participation

The regression results of the School Staff Questionnaire show that level of participation in in one year of professional development influenced the amount of self-reported changes in teaching practices over the course of one year. To corroborate those findings, we conducted an analysis of the influence of workshop participation on the year over year changes in inquiry-

based science teaching as rated by the students. This analysis included the school level aggregate ratings for all thirty-three elementary schools in the network over four years. The 2012-13 school year serves as a baseline since it is the year before the schools in CPS were reorganized into new networks. We provided a pilot version of the professional development program in 2013-14 and the first year of the full model in 2015-16. The 2014-15 school year was a gap year for the professional development intervention. Schools were categorized as active in a given year if the schools sent teachers to more than half of the workshops that year, even if the school sent different teachers to different workshops. By shifting the analytic approach from the individual teachers to the school level effects, it allows us to analyze the impact of the program despite teacher turnover.

Given that there were four measurement occasions for each of the schools, we used a hierarchical linear model to analyze changes in student rated inquiry-based science teaching. The measurement occasions served as the level 1 variable. The level of active participation at the school level (none, 1 year, 2 years) served as a level 2 variable. The baseline growth model was not statistically significant $(t(32)=1.7;$ ns). There was an interaction effect between the growth curve and the number of years that a school actively participated in the NU Leadership Academy $(t(32)=3.9; p<0.001)$. The addition of level of participation into the model reduced the variance around the slope of the growth in inquiry-based science teaching by 10%. Each year of active participation increased the growth rate by 0.15 points on the index, such that schools that were active for both years grew at a rate of 0.30 points per year over the course of the study period. There was no statistically significant difference in the inquiry-based science teaching scale in the baseline year. Figure 1 provides a graphical display of these results. The graph was generated based on the average intercept and slope for each condition.

Figure 1
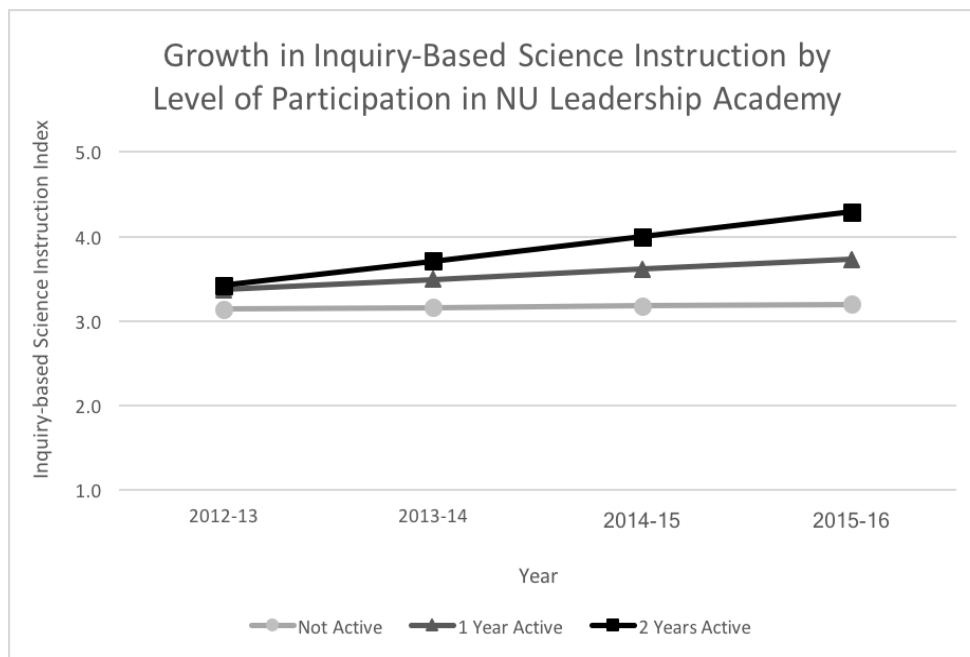
Discussion and Conclusion

In this research, we developed a professional development model based on Desimone and Garet (2015) that addressed the unique constraints of urban contexts. The levels of high teacher turnover, the small size of neighborhood schools, and the fiscal crisis in IL create barriers to fully realizing the duration, coherence, and collective participation dimension in urban contexts. In order to minimize the costs of the program to the district, we provided quarterly school year workshops such that the number of hours per year was above the threshold of 20 hours, but 20% below comparable models. To foster coherence, we aligned the quarterly workshops to the specific performance expectations that teachers were expected to be teaching around the time of the workshop. The workshops were designed to provide teachers with experience on specific lessons to be implemented. The workshop experiences were designed to focus on explanation as a core practice, thus enabling the accumulation of knowledge across workshops. At the same time, each workshop was designed to be stand-alone so that new teachers could join the program at any point.

In this research, we sought to investigate whether the level of participation the NU Leadership Academy influences changes in teaching practice. The results of analysis of the School Staff questionnaire showed that teachers who were active participants in the academy participated in more professional development overall than other middle school teachers and K-5 teachers in the same network. The level of participation in professional development was indeed a significant predictor of self-reported changes in teaching practice. All teachers in CPS had access to other general professional development about NGSS, which also had an impact on their changes to teaching practice, but to a lesser degree. We also examined whether participation in the academy workshops influenced the extent to which teachers changed their teaching practices over time as rated by the students. Over the course of three years, schools that have active participants in both years of the academy saw a statistically significantly higher growth rate in inquiry-based teaching practices. They went from a neutral rating of inquiry-based teaching practices to a strong rating over the course of three years.

In addition to analyzing the direct benefits of the program, we also investigated the indirect effects of the professional development program on other teachers at schools with active participants. After controlling for the effects of formal professional development workshops, all teachers benefited from collaborative conversations. However, collaborative conversations at schools that had a middle school teacher who actively participated in the academy had a greater influence on changes in teaching practice. In addition, the teachers who actively participated in the academy were more likely to be sought out for advice, which is consistent with prior research indicating that teachers with specific expertise are more likely to be sought out for advice (Spillane, Hallett, & Diamond, 2003). These results provide evidence that there are indirect benefits of workshop participation to improve teaching practices for teachers who did not engage in the workshop.

This research points to the promise of engaging teachers in economical professional development using a framework of best practices in professional development to design professional development that addresses the unique barriers faced by urban school districts. While more professional development would likely lead to more significant changes in teaching practice, there are practical constraints in urban settings. These results provide evidence that school districts can develop a coherent program of science professional development experiences

that fit within their existing in-service professional development framework.

  Our future research will continue to track the development of teaching practices as teachers continue in the program for additional years. In addition, future research would benefit from direct measures of changes in teacher knowledge as a mediator of changes in teaching practice as well as the impact of changes in teaching practice on student learning outcomes.

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Social Justice in Practitioner Publications: A Systematic Literature Review

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ABSTRACT: A review of the current research literature demonstrates that teaching for social justice has been accepted by the research community as best practice for students, especially diverse students from traditionally marginalized populations and communities. However, best practices do no practical good if they are not implemented into real classroom teaching. Teachers must have access to theoretically-sound, research-based, instructional practices in order for classroom implementation to occur. This paper seeks to answer whether these theories and practices which support social justice education are being circulated in practitioner oriented journals, where they are highly accessible to classroom teachers. We conducted a systematic literature review of 12 top practitioner journals across content areas. We found 68 articles focused on social justice education. Our findings indicate that the social justice articles being published in practitioner journals include some strategies to incorporate into teaching practices; however, many recommendations only support superficial social justice education elements rather than truly addressing inequities in schools and society by fully delving into all tenets of teaching for social justice.

Introduction

While social justice education and critical pedagogy have made waves in the research community since the late 1970s, a disconnect remains between what the academy purports as best practices and what teachers and administrators have access to in order to support these best practices. Social justice education and critical pedagogy include creating opportunities for students to use their own identity and experiences to determine solutions to solve problems (Cammarota, 2011) and empowering students and educators to transform educational and social inequities (Han, Madhuri, & Scull, 2015). These are necessary for growth and identity development of students in urban settings. Without this positive identity development and social and academic growth, many students may become reliant on the school system to provide tools for academic success which the schools are unable to fully deliver. As a result, schools can become places where "students are locked out of social and cultural benefits" (Ladson-Billings, 2011, p. 36).

Additionally, in an age of standards-based education, there is often insufficient time for teachers to "better understand the various 'truths' that exist and [to] better recognize their own responsibility toward sharing multiple perspectives with their students" (Baily, Stribling, & McGowan, 2014, p. 257). Sharing multiple perspectives includes telling a story or delivering information from different points of view, allowing students to see multiple sides to a story. Integrating social justice education within the curriculum in authentic ways takes a backseat to existing policies shaping K-12 education (Darling-Hammond, 2010). Furthermore, the lack of

diversity among teacher educators and the inability to move beyond theory to practice due to minimal resources and information often hinders the use of social justice curricula in K-12 education (Baily & Katradis, 2016).

A review of the current research literature clearly demonstrates critical pedagogy and teaching for social justice have been accepted by the research community as best teaching practices for students, especially diverse students from traditionally marginalized populations and communities frequently found in urban and urban-like settings (Berry & Walkowiak, 2012; Brown, Kloser, & Henderson, 2012; Ford, 2011; Ladson-Billings, 2011; Milner, 2012). The transformative abilities of this theoretical perspective are key to successful academic pursuits for students of color. However, best practices do no practical good if they are not implemented into real classroom teaching. If teachers lack access to resources making them aware of critical pedagogy, teaching for social justice, and the related supporting instructional practices, they cannot be expected to integrate these approaches into their teaching or accept social justice curriculum, critical pedagogy, or teaching in urban settings (Han et al., 2015). Essentially, critical pedagogy is the lens in which social justice curriculum is established and successfully implemented in urban settings (Han et al., 2015). Additionally, since schools in urban areas typically have access to fewer resources than schools in rural and suburban areas, with more staff turnover and curricular inconsistencies (Milner, 2006, 2010), integration of these practices proves even more difficult. This paper seeks to answer whether these theories and practices of critical pedagogy and social justice are being circulated in practitioner-oriented journals where they are highly accessible to classroom teachers.

Literature Review

Although not a new phenomenon, today's students of color are often marginalized in schools as evidenced by higher rates of disciplinary referrals (Alexander, 2010) while simultaneously being held to lower academic standards, due largely to cultural mismatch in schools and because "we live in a society that nurtures and maintains stereotypes" (Delpit, 2006, p. xxiii). Battling these stereotypes in the classroom requires an arsenal of teaching tools and strategies, including teaching for social justice by advocating for and empowering students to be agents of change for equity in their classrooms, schools, and communities (Nieto & Bode, 2008). Teaching for social justice begins with an understanding of critical pedagogy. Critical pedagogy is simultaneously a mindset, a theory, and a collection of classroom practices driving teaching for social justice. While somewhat broad and cumbersome for classroom teachers to manage, incorporating the theory and practice of critical pedagogy and teaching for social justice is crucial for student success in a world where they are pressured to conform and assimilate to their society (Stovall, 2006). Empowering students to question, analyze, and increase awareness of inequities in the educational system (i.e., critical pedagogy) can be made possible through education emphasizing the attainability of justice in all societal aspects (i.e., social justice).

In the following section, we first define critical pedagogy and social justice education. Next, we use the framework proposed by Nieto and Bode (2008) to connect theory and practice. We accomplish this by outlining how critical pedagogy can be used in the classroom to promote social justice education, leading to the purpose of the present study - discerning whether results discussed in the research community highlighting social justice pedagogy are being made accessible to classroom practitioners. Specifically, are explicit recommendations for implementation being made for classroom use?

Critical Pedagogy and Social Justice Education

Critical pedagogy has been evolving and building in popularity since Paulo Freire's (1970) publication, *Pedagogy of the Oppressed,* and the national focus on civil liberties (e.g., Giroux, 2003), specifically inequities within the educational system. While there exists no singular definition of critical pedagogy, many researchers have drafted intersecting definitions. McLaren and Jaramillo (2014) described critical pedagogy as a "narrative of universal emancipation" (p. 69), while Thomson-Bunn's (2014) definition of critical pedagogy serves to empower students to become aware of inequities within the educational system and the larger community, including the presence of racism, sexism, classism, and ableism. Such awareness and acknowledgement leads to student empowerment to advocate and promote democratic change (Kellner, 2000). Freire (1993) identified necessary inequity changes within educational contexts; change which is needed in order to build meaningful relationships among teachers and students in culturally mismatched urban schools (Darder, 2010). When students feel they are supported, respected, and empowered by their teachers, their motivation and achievement is more likely to increase (Allen et al., 2013).

While the work of Freire spoke to themes of emancipation from an educational perspective, it did not explicitly articulate classroom practices for teachers and students. Freire later extended his focus on inequity, highlighting a method of increasing possibility for transformation through his praxis (1993). Praxis, making critical reflection and taking action, happens when students see a need in their world, study to understand the need, and then present solutions to the need based upon their research (Cammarota, 2011). Ladson-Billings (1995b) took Freire's theoretical work and began to flesh out explicit actions to best serve marginalized student populations. Specifically, Ladson-Billings reiterates the need for the rejection of a deficit mindset in schools and society, noting truly culturally relevant teaching includes three elements: "an ability to develop students academically, a willingness to nurture and support cultural competence, and the development of a sociopolitical or critical consciousness" (p. 483).

Presently, to understand student development, we look to Emdin's (2016) conceptualization of "reality pedagogy" in which he synthesizes the work of the aforementioned scholars. Reality pedagogy, the process of focusing on students' cultural understanding (Emdin, 2016), assists educators in understanding the foundational knowledge students possess in the areas of justice and inequity awareness. This understanding aids teachers in meeting their students where they are concerning social justice awareness, and providing necessary information to empower students to critically analyze the current system. Not only does Emdin (2016) provide specific practices able to implement into classrooms, but also provides personal reflections on his own early years teaching to encourage novice teachers to engage in the same practice. Providing a framework accompanied by explicit action items for classroom teachers allows social justice research to become accessible; the theoretical to become practical.

When charting an evolution of critical pedagogy from its creation to present day, several elements repeatedly appear. These elements combine mindset, theory, and practice, all focused on emancipation and social justice. Social justice, defined by Johnson (2011) as "justice that is attainable in all facets of society" (p. 175), is education to liberate those in marginalized societal positions rather than to perpetuate the status quo present in society. This further solidifies today's iteration values and honors difference and culture, while simultaneously questioning and threatening the current hegemonic practices and beliefs.

Classroom Practices

Without access to current research, teachers will continue to blindly lead their students

down a misguided path of critical pedagogy in the worthy and well-intentioned pursuit of teaching for social justice. Conversely, they may not incorporate it at all due to lack of understanding or confidence in the framework itself. Classroom practices supporting the tenets of critical pedagogy and teaching for social justice are broken into four components and explored in depth by Nieto and Bode (2008), who define social justice as "a philosophy, an approach, and actions that embody treating all people with fairness, respect, dignity, and generosity" (p. 11). Each component (discussed in depth below) is critical to student success, and arguably, must be present in order to foster truly equitable education and teaching that promotes social justice.

Challenge current ideology. Nieto and Bode's (2008) first component focuses on the need for practices that challenge current understandings and question misconceptions, stereotypes, and assumptions. In the classroom, this means the teacher consistently focuses on incorporating themes of inequality and inequity, both on an individual and systemic level. Students are encouraged to problem solve and seek ways to create equity and fairness not only within their classrooms, but in the greater community.

Student access to resources. The second component highlights providing access to materials and resources needed for all students to learn and achieve their maximum potential. This includes providing material resources such as textbooks, novels, curriculum materials, worksheets, and reflective writing topics, representative of the student population being served. The teacher then provides rigorous, culturally relevant academic activities allowing students to demonstrate their learning. Additionally, students need access to emotional resources, including a teacher that holds high expectations for all students, and truly believes all students can learn and achieve at high levels. This component also incorporates addressing school policies and practices that impede students from equitable access to quality teaching, such as retention and using high-stakes testing scores to determine class placement.

Honoring student talents and strengths. The third component requires acknowledging and drawing upon students' strengths in the classroom. This component is largely based on the rejection of a deficit mindset towards students, looking at the vast array of strengths, prior knowledge, and abilities students bring to the classroom. Such recognition includes honoring student culture, experience, and language. Because this component fundamentally centers on honoring each student's life experiences, individuality must be considered when planning instruction to best allow students to access and demonstrate their funds of knowledge (Gonzalez et al., 1995).

Creating a supportive learning environment. The final component details creating a classroom environment that supports critical thinking and promotes social action and change. This component allows critical pedagogy to extend beyond the school walls and empowers students to create change within their communities. This begins with teachers, classrooms, and schools actively engaging with parents and families in multiple capacities, rather than providing minimal opportunities for parents and families to interact with the school system. Parent involvement and engagement should be reconceptualized to honor the support parents are able to provide not only at school, but also within the home and community. Finally, this component encourages partnerships between schools and communities, giving students an opportunity to affect positive change beyond the borders of their school building and to work towards a more equitable community.

Purpose of the Present Study

Today's schools are becoming increasingly diverse learning spaces. Multiple researchers note systemic factors and hegemonic forces in the current academic system that prevent diverse

learners from fully connecting with their academic environments, therefore ensuring limited success (for example, see Meier, Stewart, & England, 1989; Noguera, 2014). One method identified to combat this phenomenon is the use of critical pedagogy. Explicitly focusing on equitable educational practices and schooling that empowers students and is emancipatory in nature; that is, implementing the tenets of critical pedagogy and the practices of teaching for social justice allows for resistance against the effects of inequities seen in urban schools (Anyon, 2005).

   This paper reports the results of a systematic literature review to address whether a gap exists between what researchers are purporting to be best teaching practices for diverse students and what is being published in widely circulated practitioner journals. It is well known that in other educational fields, such as literacy, a gap exists between academic research and classroom practices (Delpit, 2012). By examining the prevalence of articles encouraging and educating on the topic of teaching for social justice, we can begin to discern whether a similar gap exists or if results discussed in the research community are being made accessible to classroom practitioners. Specifically, we seek to answer the following research question: Are practitioner journals publishing best practices for implementing social justice pedagogy in the classroom?

Methods

   We conducted a systematic literature review to examine the use of critical pedagogy in practitioner-oriented journals. We chose a systematic literature review because, unlike narrative reviews, systematic literature reviews allow for identification of all relevant articles and thus a description of trends in current practice (Garrard, 2014). This methodology follows the precedent of other studies seeking to examine the content and quality of recommendations for classroom practice (e.g., Hodges, Feng, Kuo, & McTigue, 2016; Jagger & Yore, 2012; Wright, Franks, Kuo, Mctigue, & Serrano, 2016).

Sample

   To explore the prevalence of articles published in journals most accessible to classroom teachers, we selected a total of 12 widely-circulated practitioner journals representing each content area. Specifically, we chose one journal focused on elementary level teachers, one journal for middle-school teachers, and one journal aimed at teachers working with high school students in each content area (See Table 1). We decided to review practitioner-oriented journals as these represent organizations with opportunities to, either directly or indirectly, classroom teachers with educational research. For instance, in addition to publishing three journals for practitioners, the National Science Teachers' Association (NSTA) sponsors multiple conferences each year offering "the latest in science content, teaching strategy, and research to expand...professional growth" (NSTA, 2017). Many of these publications also influence teacher education. For instance, Manzo, Manzo, and Thomas' (2009) *Content area literacy: A framework for reading-based instruction* cites over two dozen articles from the English/Language Arts journals included in this study.

Table 1: Journals included in systematic literature review

Content Area	Journal Title	*N* Articles published*	Grade focus	Sponsoring Organization
English/ Language Arts	*The Reading Teacher*	1,161	Elementary/ Early middle school	International Literacy Association
	Voices from the Middle	456	Middle School	National Council of Teacher of English
	Journal of Adolescent & Adult Literacy	818	High school	International Literacy Association
History/ Social Studies	*Social Studies and the Young Learner*	315	Elementary	National Council for the Social Studies
	Middle Level Learning	200	Middle School	
	Social Education	823	High School	
Math	*Teaching Children Mathematics*	694	Elementary School	National Council of Teachers of Mathematics
	Mathematics Teaching in the Middle School	688	Middle School	
	Mathematics Teacher	841	High School	
Science	*Science and Children*	1,055	Elementary School	National Science Teachers' Association
	Science Scope	945	Middle School	
	The Science Teacher	939	High School	

*Number of articles estimated by searching databases for all publications in the journal between 2000 and 2015

Using the EBSCO database, we searched the archives for publications from the past 15 years from all 12 journals. To be included in the current study, the article title, full text, or keywords must contain at least one of the following search terms: *social justice*; *critical pedagogy*; *critical literacy*, or *emancipatory pedagogy* (referring to empowering the uncovering of unequal social positions and power relations between dominant groups and subjugated groups; Han et al., 2015). The search resulted in 225 articles, which represents approximately 2.5% of the nearly 9,000 articles published in these journals in this time frame. We conducted an abstract screening, removing irrelevant publications such as book reviews and those addressing adult learners. The screening resulted in 68 included articles, or less than 1% of the published articles.

Article Coding

We conducted a full-text coding of the 68 included articles, first highlighting key words from our search in the text, and noting how these phrases were used. For instance, some articles simply mentioned "social justice" as part of a literature review, while others defined the concept and used it to frame their classroom recommendations. Next, we looked to Nieto and Bode (2008) and their description of specific classroom practices constituting teaching for social justice. With this information in mind, we created concrete examples, showcasing what best practices would look like in a classroom (e.g. topics focusing on inequality would challenge current ideology), and coded the 68 articles for their inclusion. These categories were not mutually exclusive, as articles could make recommendations for more than one classroom practice. We divided the sample and conducted initial coding individually. We then met as a group and discussed each article and the rationale behind codings. We made minor adjustments until all three authors were in agreement.

Results

Overview of Included Articles

In this section, we provide a description of the included articles; however, a complete article list containing specific information is available in Appendix A. The majority of the articles reviewed (56.79%, $n = 46$), focused on recommendations for English/Language Arts, with a smaller emphasis in Social Studies (23.46%, $n = 19$), and very limited attention to Math (3.70%, $n = 3$). None of the included articles made recommendations for Science. The grade level distribution across the selected articles proved relatively equal.

Of the 68 reviewed articles, 53 (77.94%) explicitly stated they made recommendations for instruction based upon the key phrases chosen for this review. Like in research publications, these phrases were defined differently by various authors. C*ritical literacy* occurred most often (50.62%, $n = 41$). Nearly half (43.21%, $n = 35$) used the term *social justice*, with fewer using the phrase *critical pedagogy* (8.64%, $n = 7$).

Recommendations for Classroom Practices

Our coding procedures, developed from the framework of Nieto and Bode (2008), revealed practitioner literature made recommendations for a variety of classroom practices (See Table 2).

Table 2: Findings for Recommendations for Classroom Practices (adapted from Nieto & Bode, 2008)

Component	Sample Classroom Practices	Articles Included
Challenges Current Ideology	● Topics that focus on inequality ● Encourage students to create equitable systems in and out of the classroom ● Community engagement and problem solving	$n = 54$, 66.67%
Culturally Relevant Resources	● Variety of texts representing marginalized populations used	$n = 42$, 51.85%
Drawing on Individual Strengths	● Incorporation of home culture, language, and experiences into lessons ● Free choice/self-selection of writing topics and readings ● Recognition of culture (beyond celebrations of stereotypical "holidays")	$n = 29$, 35.80%
Learning Environment	● Community engagement projects ● Discussion based learning ● Teacher as facilitator, not authority ● Mutual collaboration between student and teacher ● Lessons centered on empowerment for marginalized populations ● "Call to Action" based lessons	$n = 49$, 60.49%

Challenges Current Ideology. Within the 68 reviewed articles, 54 included content appropriately outlining ways to challenge current ideology. One emerging theme emphasized students making connections to the world outside of school. Authors argued these connections would not only help students understand what is being taught, but also make the learning permanent. Christie, Montgomery, and Staudt (2012), for example, highlight ways to encourage students to make a difference for equality outside of their classroom. These authors begin by describing a student's concern regarding graffiti defacing their local community. After making connections to a role model, literature was introduced to build schema for students to feel confident in how they could make a difference. Providing real world examples in addition to practical application, Christie and colleagues (2012) guide practitioners in leading their students to challenge issues affecting social justice in their community.

Creating a classroom that allows children to challenge current ideology begins with the teacher. Nussbaum (2002) outlines specific requirements that should be met by practitioners. First, a learning environment must be created where criticism and questioning is normal and valued. In addition, modeling appropriate actions, such as respect for different opinions, allows students to understand how to react to criticism and questioning. Lastly, teachers must develop a curriculum focused on cooperative learning, complex analysis, and uncertainty. This system will empower students to feel more comfortable in situations where they must question and critique

topics they may not understand or agree with.

Culturally Relevant Resources. Forty-two of the articles provided recommendations for incorporating culturally relevant resources in the classroom. Ciardello (2010), for instance, looks at resources for reading and writing poetry in relation to civic responsibility and social justice, explaining specific guidelines based upon social justice, as well as providing multiple resources practitioners can use to begin their poetry unit. These guidelines include: 1) Creating a classroom environment based upon literacy support as human right, 2) Introducing social justice poetry and its scope, 3) Providing examples of social justice poetry, 4) Making connections between social justice poetry and student's lives, 5) Establishing learning stations based upon social justice poetry, 6) Teaching reading and writing strategies, and 7) Selecting social justice topics.

Using resources to teach for social justice is not limited to reading text. Christensen (2006) details how to use works of art to look at situations from different perspectives. Christensen argues, by using art to understand history, students are able to perceive the heroes and heroines conventionally portrayed in social studies curriculum from a different perspective.

Drawing on Individual Strengths. We found examples of drawing upon individual student strengths, especially incorporating culture in a way allowing students to have choice in their learning, in 29 (42.65%) of the articles. As explained by Borsheim-Black, Macaluso, and Petrone (2014), one such way includes reading against the text. This technique involves students comprehending what is not being said (i.e., reading between the lines) as opposed to only understanding what the author explicitly stated. These authors present practitioners with questions for guiding understanding both with and against a piece of literature, allowing opportunities for developing a deeper understanding of different perspectives. Questions such as, "why is it important that we read this book?" encourage understanding with a text, while "whose story is emphasized or valorized?" are questions fostering development against the text (p. 126-127).

Taking a social justice approach to writing, explains Chapman, Hobbel, and Alvarado (2011), builds a student's confidence and allows them to accept differences among people and acknowledge criticism in their work, developing a sense of camaraderie among students. By providing a unit focused on writing for social justice, Chapman and colleagues (2011) offer practitioners a way to incorporate poetry into a lesson where students examine themselves, their community, and their world. Such evaluations further social justice education with incorporation of culture and experiences.

Learning Environment. Practitioner application for creating an environment based on collaboration, discussion, and action was exemplified in 49 (72.06%) of the articles. A key factor in teaching for social justice involves helping students "become critical participants in the world, asking questions...to make sense of what is happening around them," (Hendrickson, 2015, p. 367). For Hendrickson (2015), this was demonstrated through her work with math students, more specifically, using math to study fracking occurring in the community. Hendrickson (2015) explains how her students gained background knowledge of the topic, created questions involving mathematical explanations, performed research to answer their questions, and presented their findings on environmental impact in their community. By forcing the students to look at different perspectives, analysis concerning what they believed they knew about the concept occurred. Although the articles analyzed incorporate many of the major themes of teaching for social justice, some elements were strikingly absent, namely community engagement, empowerment, and calls to action.

Discussion

Upon review of the articles selected we noted several general themes. First, we will discuss those themes directly related to classroom practices. Next, we will describe aspects of critical pedagogy and teaching for social justice largely absent from the literature.

Classroom Practices

One of the most prevalent themes throughout this body of literature includes a call for critical questioning in the classroom. We found that authors tended to provide leading questions and question stems to engage students in critical discussions. Giving students a voice provides a strong foundation for an advancement in social justice. Being able to critically question and analyze power structures and inequities will ideally help students make informed decisions in the classroom environment, extending to situations they encounter outside the classroom as well.

The second theme addressed within many articles includes the creation and maintenance of a classroom community of learners. With any concept, students must feel comfortable to learn, take risks, and discuss topics presented in the classroom, which is only possible if practitioners set up an environment fostering and welcoming this type of dialogue. Without the establishment of a trusted classroom community, the necessary discussions will not likely occur, or if they are present, will lack authenticity and depth.

Additionally, many articles addressed the need for culturally relevant texts, often offering suggestions to aid practitioners. Choosing relevant text is one starting point for understanding how to teach for social justice, as stereotypical texts can do more harm than good by simply reinforcing previously held assumptions. Not only are the texts discussed in the articles presenting characters reflective of their communities and society at large, but they also address societal issues regarding power relationships, social injustice, racism, sexism, and governmental control.

Finally, another theme present throughout the articles analyzed included suggestions for addressing and working to change personal bias on the teacher's part. As noted earlier, researchers and practitioners in the fields of critical pedagogy and social justice education emphasize the importance of acknowledging personal bias. While indeed a critical first step for successful implementation, the published practitioner literature did little to address *how* to do this. Deconstructing beliefs, attitudes, and cultural perspectives requires a great deal of personal commitment, opportunities of exposure to cultures other than our own, and extended time for reflection and growth. Due to this, personal bias and perspectives, if truly changing and evolving, take a great deal of time to shift.

Gaps in Practitioner Literature

While a vast majority of the articles provided classroom suggestions for the incorporation of social justice and critical pedagogy themes, a limited number of the practitioner journal articles (23.8%) provided explicit ways to implement these practices. Essentially, through these publications, teachers are provided with a rationale for why these practices are important without being given the tools to easily apply them to their classrooms. Furthermore, much reviewed literature proved atheoretical, or without an explicit theoretical foundation in nature. This was especially true regarding the social studies journal publications. With the increased pressure on today's classroom teachers to infuse research-based practices into their teaching, the lacking theoretical basis in publications provides a major barrier to implementation. This pressure is doubly aimed at teachers in urban schools, many of which are labeled as needing improvement by local, state, and federal agencies. The hallmark of a good teacher is one who can take a recommendation and make modifications to fit his or her students' needs. However, if the

theoretical basis for a recommendation is unknown, it becomes difficult for teachers to ensure their changes maintain the effective components of the practice. For instance, many articles discussed the importance of culturally relevant texts. However, without the theoretical grounding explaining *why* culturally relevant materials are important, teachers end up attempting "to insert culture into the education, instead of inserting education into the culture" (Ladson-Billings, 1995a). In other words, teachers may utilize materials related to students' culture, but fail to use those materials to build a deeper connection between the students, their education, and their community.

While a handful of articles discussed the need for collaboration and partnership within and across school communities, this was one tenet largely absent in articles. Collaboration on both the macro and micro level within schools and communities remains absolutely critical to the success of social justice education, as it provides an authentic context in which learning and critical discussion can occur. Furthermore, strong culturally responsive partnerships between schools and communities are shown to be highly impactful on student outcomes in urban schools (Ford, 2011). By its very nature, critical pedagogy and teaching for social justice challenge the status quo, and this cannot always be authentically addressed solely within the school building walls. At the micro level, teachers must begin to collaborate more with one another on cross-curricular lessons. While fifteen articles from our sample noted interdisciplinary collaboration, only four (i.e., Albright, Purohit, & Walsh, 2002; George, 2002; McLaughlin & De Voogd, 2004; Young, 2001) explicitly discuss interdisciplinary collaboration in settings beyond the elementary school level.

Collaboration at the macro level must also be present for successful implementation of teaching for social justice. Examples could include classroom teachers partnering with universities or colleges in their area, matching researchers in educational curriculum and leadership programs with teachers actively in the field. These partnerships would provide opportunities for researchers to be actively engaged in the field as well as place classroom teachers in a position to access the breadth of knowledge available to the academic community. Furthermore, collaboration with researchers could encourage classroom teachers to publish their social justice education practices in practitioner publications.

Conclusion

It is apparent a gap exists between what is purported by research journals and what is being published in practitioner journals. To be sure, the social justice articles published in practitioner journals have a high rate of lessons or strategies to easily incorporate into teaching practices; however, many recommendations only support superficial social justice education elements rather than truly addressing inequities in schools and society by fully delving into all tenets of teaching for social justice. Future research should examine other avenues by which teachers access classroom resources, such as social media or online publications to see if these outlets, while not sponsored by research organizations, may be providing stronger recommendations for incorporating social justice into the classroom.

To narrow the gap between research and practice, the research community must begin to collaborate more effectively with classroom teachers. As long as their published work is largely inaccessible, it will not have the chance to be implemented into classrooms. In addition to the practitioner journals, each major content area organization has at least one research journal they publish and circulate to members. This is an excellent opportunity to begin integrating social justice educational research into the content area organizations. Furthermore, classroom teachers

need to be empowered to write and publish their experiences with social justice teaching. Circulating knowledge and strategies is critical to the success of marginalized student populations (Burke & Hardware, 2015).

Critical pedagogy is simultaneously a mindset, a theory, and a collection of classroom practices driving teaching for social justice (Stovall, 2006). While somewhat cumbersome for classroom teachers to manage, incorporating the theory and practice of critical pedagogy and teaching for social justice is crucial for student success, specifically in urban schools. Critical pedagogy implementation and social justice education in classrooms is not clear cut or easily measurable, standing as one reason it is likely avoided by classroom teachers. Furthermore, due to its nature of challenging the status quo and threatening current social, economic, and political systems, critical pedagogy has developed a radical and threatening stigma. This stigma associated with critical pedagogy and teaching for social justice must change in order to better serve our marginalized students and to ensure equitable educational opportunities in urban schools.

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Appendix A
List and Description of Articles Included in Review

Citation	Grade Level	Subject	Practical Teaching Application			
			Challenges Current Ideology	Culturally Relevant Resources	Drawing on Individual Strengths	Supportive Learning Environment
Albright et al. (2002)	6-8	ELA & Science	X			X
Bean & Harper (2006)	9-12	English/LA		X	X	X
Bean & Moni (2003)	9-12	English/LA	X	X		
Blackburn & Smith (2010)	9-12	English/LA	X	X		
Boatright (2010)	9-12	English/LA	X	X	X	X
Borsheim-Black et al. (2014)	9-12	English/LA	X		X	X
Bourke (2008)	K-5	English/LA	X			X
Brown (2013)	K-5	English/LA & S.S.		X	X	X
Chapman et al. (2011)	9-12	English/LA	X		X	
Cherland (2008)	9-12	English/LA	X	X	X	X
Christensen (2006)	K-5	Social Studies	X	X		
Christie et al. (2012)	K-5	Social Studies	X			X

Ciardiello (2004)	6-8	Social Studies	X	X		
Ciardiello (2010)	K-5	English/LA & S.S.	X	X		
Clarke & Whitney (2009)	6-8	English/LA	X			X
Dever et al (2005)	K-5	English/LA & S.S.	X	X		
Dorfman & Rosenberg (2013)	K-5	Social Studies	X	X	X	X
Dubois (2011)	K-5	Social Studies	X	X	X	X
Dunkerly-Bean et al. (2014)	6-8	English/LA	X	X		
Falter (2014)	9-12	English/LA	X	X		
Fertig (2005)	K-5	English/LA & S.S.				X
Ford & Neville (2006)	K-5	English/LA	X	X		X
Frye & Hash (2013)	6-8	English/LA & S.S.				X
Gainer (2013)	9-12	English/LA		X		X
Garrett & Schmeichel (2012)	9-12	Social Studies	X	X		
George (2002)	9-12	English/LA & S.S.	X	X		
Golden (2006)	K-5	English/LA & S.S.	X			

Hall & Piazza (2008)	K-5	English/LA	X	X	X	X
Harste & Albers (2013)	9-12	English/LA	X	X		
Hendrickson (2015)	6-8	Math			X	X
Johnson (2010)	6-8	English/LA		X	X	X
Johnson (2011)	6-8	Math	X	X		
Kelly (2012)	6-8	English/LA	X	X	X	X
Khasnabis & Upton (2013)	6-8	English/LA	X			X
Labadie, et al. (2012)	K-5	Social Studies		X	X	
Lapp et al. (2012)	K-5	English/LA & S.S.	X	X		
Lara & Leija (2014)	K-5	English/LA	X		X	X
Luke & Woods (2009)	6-8	English/LA	X	X		
Maples & Groenke (2009)	6-8	English/LA	X			
McCoy (2008)	6-12	Math	X			
McGinnis (2006)	6-8	English/LA		X	X	X
McLaughlin & De Voogd (2004)	6-12	English/LA & S.S.	X	X	X	X

Mellor & Patterson (2000)	9-12	English/LA	X			X
Morrell (2002)	6-12	English/LA		X		X
Myers & Beach (2001)	6-12	English/LA	X			X
Nussbaum (2002)	6-8	Social Studies	X		X	X
Ostrow (2003)	9-12	English/LA	X	X		
Pailliotet et al. (2000)	K-5	English/LA	X			
Park (2012)	6-12	English/LA	X		X	X
Perry et al. (2013)	9-12	English/LA			X	X
Phelps (2010)	9-12	English/LA	X	X	X	X
Powell et al. (2001)	K-5	ELA, S.S., & Science	X	X	X	X
Rozansky & Aagesen (2010)	6-8	English/LA	X	X	X	X
Sandmann (2004)	K-5	English/LA	X	X	X	X
Schieble (2012)	9-12	English/LA	X	X		
Sider (2010)	K-5	Social Studies	X			X
Simmons (2012)	9-12	English/LA	X	X		X
Soares & Wood (2010)	K-12	Social Studies	X	X	X	X

Sonu (2011)	K-5	English/LA & S.S.				X
Spector & Jones (2007)	6-8	English/LA				X
Stokes (2010)	K-12	Social Studies	X	X	X	X
Tyson & Park (2006)	K-5	English/LA & S.S.	X	X	X	X
Vasquez (2010)	K-5	English/LA			X	X
Wade (2000)	K-5	Social Studies	X			
Wilson & Laman (2007)	6-8	English/LA & S.S.	X	X	X	X
Wood & Jocius (2013)	K-5	English/LA	X	X		X
Yokota & Kolar (2008)	K-5	English/LA	X	X	X	X
Young (2001)	6-8	English/LA & S.S.	X		X	X
Total Percentage			54 66.67%	42 51.85%	29 35.80%	49 60.49%

Integrating Engineering into an Urban Science Classroom

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ABSTRACT: This article presents a single case study of an experienced physical science teacher (Janet) integrating engineering practices into her urban science classroom over a two year time frame. The article traces how Janet's understanding of the role engineering in her teaching expanded beyond engineering as an application of science and mathematics to engineering as a humanistic and socially-just activity with the potential to empower her students. The data for this qualitative case were gathered over a two year period during which the teacher participated in an engineering professional development program. The data were gathered from five interviews, observations of implementation, student artifacts, lesson plans, and Janet's journal reflections. Three primary themes arose around the role of engineering in her urban classroom: real-world problems and applications, student engagement and learning, and solving complex problems. These themes each contributed to Janet's expanded understanding of engineering from a focus on engineering as a general STEM career to engineering as problem solving strategies which empowers students to be active participants in their urban community.

Research demonstrates a persistent education deficit (Ladson-Billings 2006) between urban and/or low SES science students and their more affluent suburban counterparts (Barton & Tobin, 2001; Knapp & Plecki, 2001; Fraser-Abder, Atwater, & Lee, 2006; Cone, 2014). Although science education research has made strides towards understanding what effective science teaching looks like (Knapp & Plecki, 2001), the implementation of these practices into classrooms, urban and otherwise, has proven difficult (Fraser-Abder, Atwater, & Lee, 2006). Standards-based instruction with its analogous testing continues to highlight difficulties closing this science achievement gap (Geier, Blumenfeld, Marx, Krajcik, Fishman, Soloway & Clay-Chambers, 2008). It is unclear how the adoption of the *Next Generation Science Standards (NGSS)* by many states will impact this urban/suburban science achievement gap. However, we do know the new standards require urban science teachers to add engineering practices into their science instruction.

The addition of engineering practices has left science teachers across the nation struggling with how best to implement this new and complex reform goal, a situation potentially more complicated for urban science educators. Urban secondary science teachers are frequently faced with greater accountability pressures, less prepared students, rigid curricula, and low expectations for student success than their suburban counterparts (Barton, 2001). Additionally, there are few examples of what effective integration of engineering looks like that would provide guidance to the courageous teachers who are willing to take on the challenge.

In this qualitative case study, I present Janet's two year journey as a participant in an engineering professional development program. The case explores how Janet's view of the role of engineering in her instruction changed over her two years of participation in the professional development program. Janet's story was documented through interviews, observations, and surveys to understand her beliefs about teaching with engineering at program entry and after two years of implementation. Janet's reflections on her and her students' successes and struggles with

the engineering integrated instruction provide insights for other urban science teachers on the potential of integrating engineering practices into urban classrooms. Specifically, I focus on the following research question: In what ways does an experienced urban educator's beliefs about teaching with engineering change over cycles of implementation to meet the needs of her urban students?

Review of Literature

This study is situated in two literature bases: urban science education and the engineering education. The urban science education literature establishes the call for change in how we are working with urban youth in science classrooms and the reform-based instruction suggested to close the current education debt. The engineering education literature adds detail to this specific science reform-based strategy as suggested in the new national standards. This literature provides a powerful argument for the inclusion of engineering into the science curriculum. This study brings these two literature bases together by detailing how one urban science teacher brought engineering education to life in her classroom and by doing so found ways to overcome aspects of the urban education debt.

Urban Science Education

If we rely singularly on the statistics about the success of urban students' science achievement, the situation is bleak. Martin, Mullis & Foy (as cited in Cone, 2014) found that students in urban schools, nationally and internationally, were well below the international average on the 2007 Third International Mathematics and Science Study (TIMSS). In addition U.S. national reports indicate a significant achievement gap between the students of color, who are likely to populate urban schools, and their white counterparts (National Center for Educational Statistics [NCES], 2011). This same report disaggregated the data further to isolate out students living in poverty and found low income students performed well below their more affluent peers.

Reasons for the reported lack of success, education debt (Ladson-Billings, 2006) for urban secondary students in the sciences parallels that of other academic subjects: ". . . curricula designed for low ability students, limited access to the best qualified science teachers, preconceived stereotypes about diverse student groups which affect teacher expectations and an educational system that is structured to benefit the hegemony" (Cone, 2014, p. 161). In addition to these systemic challenges, urban science teachers frequently face limited resources, including laboratory materials as well as instructional time, a lack of classroom authority to make decisions about deviating from tested accountability measures, and students who themselves have internalized a dislike for science and learning (Barton & Tobin, 2001; Fraser-Abder, Atwater, & Lee, 2006).

In *Science Education for All,* researchers and policymakers repeatedly called for the use of reformed-based instructional models that are based on a socio-constructivist learning framework and draw upon students' experiences and topics of relevance (Barton, 2001; Elmesky & Tobin, 2005; Geier, et. al., 2007; Cone, 2014). The reform-based models sought to counter the dominant curricular trends found in many urban science classrooms by engaging the students in complex science investigations, such as true laboratory research, problem-based learning, student driven inquiries, or a focus on socio-scientific issues. These instructional models have shown promise within their individual contexts, but barriers to expansion remain. However, if the science achievement gap is to be closed, success on the small scale must continue be supported while new innovations are developed, implemented, and researched offering urban science

teachers a full array of reformed-based models of instruction.

Engineering Education

The *NGSS* framework requires the explicit inclusion of the engineering design process (EDP) as both a process for learning core science concepts and as a context for instruction (Achieve, Inc., 2013). The use of engineering in science education is not new; students have had egg drop challenges and built catapults for years. In its early use the engineering design process was viewed as a gateway to authentic learning (Crismond, 2001; Kolodner, 2002).

However, the *NGSS* clarified the role of engineering and determined it to be an essential aspect of the study of science on equal footing with science inquiry. Rodger Bybee (2011), in preparation for the forthcoming *A Framework for K-12 Science Education* (National Research Council, 2012), elaborated and exemplified the comparable practices used in inquiry and engineering. The NRC's *Framework* (2012) did not define a specific engineering process, rather developed broad outlines for the design process that engage students in all eight practices.

With the establishment of the *NGSS,* there was a general agreement that engineering-based instruction engages students in grappling with the underlying science and mathematics content in a design problem. However, engineering does not exclusively rely on science and mathematics (Hynes and Swenson, 2013). Engineering is a human activity, one which seeks to overcome problems of humans. Hynes and Swenson (2013) see an additional goal of engineering in K-12 classrooms to introduce the social science and humanities into science instruction. They propose that engineering should be understood as a holistic pursuit where "social sciences and humanities knowledge and skills are applied in the pursuit of engineering *for* people as one engineers *with* people" (Hynes and Swenson, 2013, p. 32). A humanistic engineering focus requires an understanding of the constraints on design as determined by the needs of people and societies that are frequently shifting, contentious, and require judgment calls and empathetic decisions. In addition to disciplinary science and mathematics, Hynes and Swenson's (2013) vision of engineering *for* and *with* people in classrooms engages students in following disciplines: psychology, sociology, communications, law, economics, and ethics. Including this human focus on engineering, teachers and students must grapple with a broader range of problems, issues, and constraints that can give rise to discussions of power, voice, and justice.

Penuel (2014) directly argued for the importance of science and engineering being taught as practices in order to fully engage a humanistic view of engineering. He framed the need to shift to a humanistic view because "focusing on science *in* practice, …, foregrounds peoples' contributions to everyday social practices and asks how science and engineering figure in and are developed through social practices" (p. 2). Penuel, Lee, & Bevan (2014) emphasized the need for science and engineering practices to develop students' agency and be co-constructors of their futures and for society. Barton (2001) explained and exemplified these ideas through her use of place-based learning of science with urban students. For each of the authors above, the importance of science and engineering practices in education is to offer students insights into their own agency and ability to transform society.

Methods

This qualitative case study tells Janet's story as she integrated engineering-based lesson into her physical science class. As a qualitative case study, the focus is on how she described her thoughts and experiences (Merriam, 2009). I have presented Janet's story through the use of constructed themes to better highlight the changes in Janet's thinking, since, as Stake (1994) explained, "most personal experience is ill-structured, neither pedagogically nor

epistemologically neat" (p. 146). Therefore, ideas must be organized and structured for presentation. Prior to the full case, I describe the context followed by the data instruments and analysis.

Context and Participant

Janet was a participant in a two year professional development (PD) experience offered by a local university and funded by the National Science Foundation (NSF). The teacher participants for the extended PD experience came from one of eight partner school districts. Janet was a member of the second cohort of 20 secondary science and mathematics teachers participating in the program. The biology teacher, Claire, from Janet's school was also a member of the cohort. Janet and Claire were friends as well as colleagues and worked closely with each other throughout the PD program. Janet and other teachers in the cohort came to campus for seven weeks for each of two summers. During the summers, the teachers participated in engineering and disciplinary coursework, pedagogical workshops, and unit design sessions. The teachers were expected to develop three engineering units each summer, which they then implemented and revised during the academic year. Janet was one of a subset of the PD participants who volunteered to participate in a research study connected to the program. I served as a researcher for the program.

The PD program was developed by a team of engineering faculty, disciplinary science faculty, and retired secondary mathematics and science teachers. The PD design team used a Challenge-Based Learning (CBL) framework to structure the engineering design process. A CBL environment provides a motivating problem to solve that address a larger societal issue in which the engineering design process (EDP) is embedded within it. Thus, a focus on CBL closely aligns with a humanistic approach to engineering. The goal of the PD was for the teacher participants to develop engineering based units where students would grapple with a complex problem rooted in a larger social issue that integrated the required science content in engineering design process (Johnson, Smith, Smythe, & Varon, 2009).

Janet, African American teacher in her mid-forties, was born in the same city where she is now teaching. In 1987 she graduated from the district's academic magnet high school, then went away for college. She received her BS degree in chemistry from a Historically Black University in the Southeastern United States in 1991. After graduation, she worked as a product researcher for ten years before returning to school to receive a secondary science teaching license. When she began the engineering PD, she had been teaching for ten years and was the science department head at her school, Mid-City High School. She had taught science at Mid-City for seven years and was considered a school and district leader by her teaching colleagues and district curriculum coordinator. Janet's primary teaching assignment, and the focus of her engineering lessons, was a required physical science class.

Mid-City High School was part of the district's portfolio of high schools; any student in the district could select to attend Mid-City. Although, in reality, the majority of students came from four nearby elementary schools. Mid-City served students in grades 7-12. The September student count was approximately 700, 75% of whom qualified for free or reduced lunch, 95% identified as African American or multiracial, and 27% were on a disability plan. Although the students' performance on State mandated tests was lower than the district's average, they had been improving over the last four years but were still lower than the State's proficiency levels.

Janet's classroom was on the second floor of the school, which had been newly built in 2007. The school had well-equipped science classrooms and resources. Mid-City and the district as a whole had moved to a one-to-one laptop program; however the laptops remained in the teachers'

classrooms rather than being assigned to a student. Janet's taught five classes of physical science with class sizes that ranged from 18 to 32 students. All classes were inclusion classes, although the special needs students were clustered in two classes.

Data Gathering and Analysis

The data were gathered from June 2013 through May 2015. The full data set included a survey given twice, two structured interviews, three semi-structured interviews, nine classroom observations, teaching artifacts, and student work.

At program entry and exit, Janet completed a Current Instructional Practices (CIP) Likert response survey that asked how frequently and how confident she felt about teaching practices related in engineering and CBL. The survey stem for frequency read, "To what extent does your current instruction incorporate these practices" and included items such as:

- Explicitly connect class content to complex problems
- Guide students in planning investigations to better understand different components of problems
- Provide opportunities for students to test their solution pathways
- Provide students with opportunities to refine and retry a solution pathway

At program entry and during the second summer, a structured interview, Conceptions of Teaching Engineering (CTE), was conducted. The CTE interview was modeled on Hewson and Hewson's (1989) conceptions of teaching science modified for engineering. The interview consisted of eleven teaching scenarios. For each, Janet was asked if she considered the scenario to be an example of teaching engineering and what told her it was. Or if she did not consider it an example of teaching engineering, to explain what would be needed for it to be teaching engineering? Example scenarios included:

- In an 11th grade physics class, the students use a rocket kit to build a compressed air rocket.
- After an accident in the school parking lot, the teacher for an after school enrichment project decides the group should develop a traffic regulation system.
- A math teacher has students measure the water wasted by a dripping faucet in a 10 minute interval then create a linear equation to represent the data.

During each academic year, one unit implementation was observed and one post-unit interview conducted. In the interview, Janet was asked to reflect on how she felt the unit went, where she and her students were successful, and where she felt they struggled. At the end of the two years of PD, a final exit interview was developed based on themes and questions arising from the previous data. In addition, she reflected on how she felt the PD impacted her as a teacher. Instructional artifacts, such as lesson plans, handouts, and student work, were available if needed.

The analysis was conducted in phases: program entry, year one implementation, second summer, year two implementation, and program completion. Each phase resulted in themes and written summaries. The summaries were used to guide future observations and construct the final interview in an iterative process as is standard with qualitative studies (Merriam, 2009).

Interview and observation data were initially coded with pre-determined codes guided by the CBL literature with three general categories: engineering, student/learning, and teacher. The general categories focused on the subject of the coded item. The categories were then further coded to understand the details of the general categories. Table 1 provides examples of the categories, codes, and use.

Table 1: Sample codes from interviews and observations

Category	Code	Example
Engineering	Design process	I think about a process of being clear about what the problem is, designing and redesigning to apply skills and knowledge to a problem.
	Parameters	Now like in some classes our budget is only for mini-marshmallows and toothpicks.
	Products	I can build a better bike
Student/ Learning	Decision-making	They're doing prototypes or do a prototype and then go back and do more brainstorming
	Evaluating	Determine if it meets the criteria that they have developed.
	Data gathering	What variables need to be controlled? I mean if they look at one variable at a time …
Teacher	Problem context	It could be an example of teaching engineering, if the problem is applied to a building … or some type of technical problem.
	Applications	I think I did not do as good a job as I could have in having actionable components.
	Assessment	The teacher might be gathering some data as a formative assessment to see if they are on the right track.

The CIP survey questions and codes for the CTE interviews focused on similar ideas, which allowed for comparison between how Janet rated her own teaching practices and what she believed constituted good engineering teaching practices, and her stated comfort level with the different aspects of CBL practices and her observed implementation of the practices. Janet had access to all data during the process and was sent each summary statement at the end of an analysis stage, as well as the full set of summary statements leading into the creation of the case. Janet did not provide any feedback or offer suggestion or revisions.

Findings

In the first year, Janet's engineering focused lesson took place during the physics unit on energy transformations. The global challenge she identified was on forms of renewable energy to reduce reliance on fossil fuels contributing to global warming (Lesson plan 3.0). The specific classroom challenge she wanted her students to engage in was to create a Rube Goldberg machine to do work without using electricity. In the second year, Janet's focal unit was from the chemistry component of physical science and focused on mixtures and chemical changes. The global challenge she focused on was the development and maintenance of effective infrastructure, and her local design challenge was for students to develop a strong and cost-

effective concrete mixture for a local bridge.

Overall, Janet's beliefs about the role of engineering in her science instruction focused on two primary themes which arose across the data sets and are relevant to understanding her ideas about using engineering in urban classrooms. These themes and their changes over the two years included her beliefs about the nature of engineering and the teaching and learning of engineering.

The Nature of Engineering

Janet's initial discussions of the role of engineering in her instruction stressed the differences she perceived between science and an engineering challenge. For Janet, the purpose of teaching science was for her students to understand the content and be able to perform simple inquiry activities. Science inquiries were driven by a structured hypothesis, whereas engineering challenges were being driven by problems. Also, the problems that engineers engaged in were technical, as she explained in her first interview: "It could be an example of teaching engineering, if the problem is applied to a building, developing a building, or if it is applied to some kind of technical problems" (Int. 1 lines 124-128).

Since engineering was problem driven, it provided an interesting context for using science content: "I think if they can see how it applied in a real-world problem or a real work situation, then it is engineering because they're solutions to problems and not just learn content" (Int. 1 lines 342-344). Later she stated, "I definitely think that's engineering because they're figuring out a problem. They're applying the content to a problem about getting maximum speed" (Int. 1 lines 392-394).

Janet explained the relationship between science inquiry and engineering design in response to a question about graphing the rate of a leaking faucet:

> As is, it's not an engineering project, but it could be, if they were asked to use that data to solve a problem from there, like, since we're [with a leaking faucet] wasting this much water … you're still measuring the faucet dripping, you're still plotting data, I think this is just the data collection stage of the process, because it's [engineering] tying into some bigger problem. (Int. 1 lines 316-321)

In her early thinking, Janet highlighted engineering as involving problems that helped connect science content to the real world.

The use of a general problem, rather than student experience-based problem, was also reflected in her first year's lesson plans. For the global challenge, she situated energy transformations with forms of renewable energy leading to a reduction in fossil fuel use leading to global warming (Lesson plan 3.0). However, her specific in-class design project was to create a Rube Goldberg demonstrating at least three energy transformations (Lesson plan 3.0). The students were introduced to a Rube Goldberg device via a YouTube video of a competition (http://www.youtube.com/watch?v=WiHn5_RfKjE). Although the video is interesting and clearly presented a challenging design task, the application to the real-world problem and the students' needs or experiences was distant.

During implementation, Janet's teaching drifted further away from engineering as a way to address human problems when she allowed her student to design roller coasters as long as they met the science content (energy transformations) objectives (Obs. notes. 4/1/14 – 4/11/14). In the post-observation interview, Janet explained how in each class some student groups argued for alternate design task, such as roller coasters. As she reflected on this, she acknowledged that many of the students did not see the connection of the Rube Goldberg device to a real-world problem.

I feel like we missed the boat. I think we tried initially but kind of lost our way because

we just focused on making sure the students engaged. We know that they're engaged. They're probably learning or we hope they're learning, but the intent of having deeper and stronger connection to the world, I think we missed that. So that's something we have to think about. (Lines 24-32)

Janet's reflection on the lack of a strong connection to a real-world problem is the beginning of her shift towards a more humanistic approach to engineering as part of her understanding of the nature of engineering. In her second engineering interview, she expanded the nature of engineering to include solutions based on people's needs. For example, in a question about food production she said, "maybe they developed criteria based on what their customer base is" (Lines 85-86). She suggested engineering could include economics as she explained knowing this would focus the research for students: "But you know whatever the criteria is, they choose to make it, they choose to sell it, they may do some research" (Lines 87-89). And later, "some cost-benefit analysis to talk about feasibility" (Line 203). Finally in this interview, she discussed that communities and ethics around ecology would need to be part of the decision-making about the engineering problem of a dam construction.

In Janet's second year of implementation, she began to explicitly tie her engineering problems to her students' experience base and community. Janet's engineering lesson was tied to her science curriculum as part of the chemistry content on mixtures and reactions. Her design task at the global issue idea focused on infrastructure development; however what she stressed was the local need for new bridges. She focused on several local bridges that had been in the news due to their needed replacement. With this specific and local context in mind, the students brainstormed all the problems with infrastructure development in an urban setting. The students raised issues including: traffic disruption, potholes, homes to be destroyed, costs, taxes, tolls, noise, and pollution created during construction. They related their own experiences with being late for school because of road closures or friends who couldn't open windows all summer because of dust from road construction. Once these personal experiences were on the table, Janet shifted to the classroom engineering problem the students would address as part of this bigger network of problems. The next day, the students brainstormed and researched what might be important variables to consider for the cement in the local environment. The students identified variables such as, traffic volume, salt and snow plowing, cost, accessibility of the materials, the look of the bridge, amount of space it would take up, and other style issues. Finally, Janet brought the focus on the issue of traffic volume and concrete composition and how they were going to design the best concrete for the traffic volume (Obs. notes 1/25 - 27/15).

In this second year of implementation, Janet's view of the nature of engineering encompasses all components the engineering as a humanistic view of engineering. The students connected their experiences with infrastructure to the design task. As the students worked on the concrete, she continued to return to her students' experiences, reminding them it was important to be careful as they would have friends and family driving across these bridges.

In her final interview, Janet reflected on the importance of having the students understand that engineering addresses problems in their lives and community. She felt it was important for her students to see local impact of engineering so they could understand how engineering impacts people throughout the entire design process and not just as a completed product.

Janet's ideas about the nature of engineering became more complex over the two years of the project. Her initial views fit perfectly within a standard view of engineering as the use of science and mathematics knowledge to overcome problems. She drew on her science background as her first lens for understanding engineering, comparing the processes of science with the

processes of inquiry. But as she became more familiar with engineering and observing and reflecting on how her students interacted with her design challenges, she was ready to expand her vision of engineering to include and emphasize the human side of the process. The shift from viewing engineering as a simple application of science to engineering as a complex human activity is one step toward using engineering for social justice. The second step is detailed in the next section.

Teaching and Learning with Engineering

In Janet's first year, she placed high value on engineering tasks to increase student engagement, which she believed would improve her students' learning as defined by specific content goals and objectives in her lesson plans. As such, in the action of the classroom, she focused on engagement over learning outcomes. In her first unit on energy transformations, Janet allowed the students to drift from the intended Rube Goldberg machine defined in the engineering task to other products. In her reflective interview indicated the freedom she gave the students was positive, "… some kids said I don't want to do that. That's not challenging enough for me. They broke off from the class and said I want to design a roller coaster" (Lines 120 – 122). However, after the end of the unit test she lamented, "They have a big picture of it [the content] and they may realize they're using the information but then when you ask for it in another form, they can, the gap is too big" (lines 1089-1091). The lack of expected learning as demonstrated on tests worried Janet and helped her to rethink what she wanted in terms of engagement, relevance, and learning. She stated, "this summer I am going to be thinking about a little harder [sic] about how I can make it more relevant to them" (Lines 314-315).

In her second year of implementation, in addition to focusing on problems important to the local community, Janet expanded what she valued about the learning. She did not drop the importance of understanding the science, but she also focused using the engineering design process to solve social and community problem, build her students' confidence, and their role as citizens.

Two specific examples demonstrate how Janet worked to directly connect the engineering design process to strategies of Dr. King portrayed in the movie *Selma*, which the class had seen the previous day. Janet drew the students' attention to the conflicting points of view about civil rights and how this was similar to addressing the pros and cons of where a bridge should be located (Obs. notes 2/5/2015). In another instance, she discussed how her engineering unit had led to a collaborative design project focused on infant mortality, a high priority health problem in the city:

> At the end of the school year, our challenge was to look at infant mortality. So I proposed to the team that we do an interdisciplinary unit … so we developed a challenge to see what can we do, can we look at co-factors that are affect infant mortality as it related to science and social studies…. But the challenge really came out of our classroom, which was what can we do to minimize environmental factors related to infant mortality? (Lines 876- 893)

Janet was not only expanding what she included as engineering, she was using engineering to help her students see how the design process is a powerful tool for solving complex problems in and out of science.

In addition to learning science and the engineering design process, Janet also wanted her students to be successful even if it meant taking risks. In the post observation interview, Janet explained why she believed it was particularly important for her students to be successful: "I know students feel, and they have shared with me, they're at a disadvantage because of resources

and being in urban schools and I kind of hate that that's been communicated to them" (Lines 429-435). She felt the students lacked confidence to take on challenging problems. Janet explained how the idea of freeing up her students' thinking about right and wrong answers had impacted what she did and wanted to do her classroom:

> They can't, students would often answer, well I don't want to answer because I might be wrong. So really developing a culture of risk-taking, that's something I think I had to focus on the second year, to allow students to make mistakes and to constantly say, okay we may make mistakes, but it's part of the process. (Lines 68-72)

For Janet, allowing her students to work on complex problems was a demonstration in her confidence in them that they could be successful and could build from these successes for the future. She discussed her final priority as helping her students work through complex problems since her teaching was not just school but for their futures as citizens:

> If you put words like ethics around it, I think it would change the way they think about it. They would think about a responsibility, not just as a citizen in the classroom, but they think about it as their responsibility in the world. (Lines 555 – 557)

Over the two years of the project, Janet's use of engineering as a tool for improving her students learning reflected her changing view of the nature of science. She increased the complexity of the thinking she required of her students by intentionally muddying the problems with the inclusion of economics, psychology, sociology, and ethics. She wanted the students to see engineering not just as a way to make good concrete, but as an integral part of the design of communities. Once Janet included the humanistic side of engineering into her framework, her goals for her students' learning expanded also.

Conclusions and Implications

Janet's initial ideas of engineering focused on the importance of engineering for people to overcome problems in the world; however, she struggled with how to define appropriate problems for her students. Over the two years, Janet revised her thinking and focused on meaningful localized design tasks that fit her students' knowledge and experiences. Local community problems served as the hook and the anchor for the design task which were then connected to larger global and abstract problems. This focus on local issues aligned her view of the nature of engineering with Hynes and Swenson's (2013) humanistic approach to engineering. In addition, it aligned her teaching practices with place-based urban science educators like Lim and Calabrese Barton (2006) and Penuel's vision of engineering as social practice. A second shift in Janet's beliefs and practices addressed the limitations of engagement as an outcome. The students engaged with the "fun" parts of design, but seemed to resist the hard work of learning. Janet felt her students had internalized messages from the larger society that urban African American students were not good at solving complex problems and did not see themselves as active agents in their communities. Over the two years, Janet introduced the idea to her students that they could be the agents of change and the design process was a way to organize thinking towards making change.

The stated purposes for integrating engineering into science curriculum are focused on laudable cognitive goals for students and the STEM workforce (Crismond, 2001; Jacob and Parkinson, 2015). However, like much of science, it is presented as politically neutral. Even Challenge-Based Learning, which is premised on the idea that students would find global problems compelling to study, does not emphasize a political stance. What Janet's case demonstrates is the potential of a humanistic approach to teaching engineering to develop

teachers' and students' understanding of issues of social justice in their local communities. Janet did not just learn to use engineering as an instructional strategy; she articulated a new imperative for herself as a teacher and her students. She believed it was not enough for her students to do well in school only as preparation for college or careers; they should be empowered to tackle the problems of today in their own community.

I am not suggesting integrating humanistic vision of engineering is the only answer to creating cadres of critical educators for our urban students. However, if the integration of engineering into science instruction can result in experienced teachers shifting their focus to a more place-based curriculum with a social justice focus, it can be a powerful tool for reinvigorating urban teaching and breaking the cycle of a reductionist curriculum.
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Typologies for Effectiveness: Characteristics of Effective Teachers in Urban Learning Environments

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ABSTRACT: Despite increasing diversity in U.S schools, the topic of teacher effectiveness remains to be dominated by a universal narrative. This study applies critical theory, critical race theory, and culturally responsive pedagogy to position teacher effectiveness as contextual to urban schools and relational to the asset-based view of the learner. This study employs a phenomenological design to gather the shared experiences of nine teacher educators with teaching and service experiences in urban schools. The findings produce typologies of effective and ineffective teachers, identifies characteristics of effective urban teachers, and details the style responsiveness of effective teachers in urban schools. This study concludes with recommendations for school leaders and teacher educators to use the findings to impact the effectiveness of in-service and pre-service teachers for urban schools.

Keywords: teacher effectiveness, urban schools, cultural responsiveness

Introduction

The central problem observed in this study is the problem of the long tradition of universality in the approach to effectiveness, in which effectiveness is a one-size fits all model regardless of school setting (Eckert, 2013; Haberman, 1994). The universal approach defines teacher effectiveness as an outcomes-based perspective rooted in the following paradigms: a) the reliance on student test scores, and/or b) teacher credentialing (Rockoff & Speroni, 2011; Silva-Mangiante, 2011). This perspective assumes that if the tests are the same and there are certified teachers in classrooms, effectiveness can be known by the outputs of the school or classroom. This philosophy is problematic in that the assumption of universal effective teaching makes all missteps in the classroom automatically the fault of the learner, which reinforces deficit-based perspectives of learners who do not respond to the universal style of effective teaching. Further, the assumption of universality in effective teaching reinforces a reproductive approach to teaching, affirming of the status quo, that favors the dominant group for which the framework for effectiveness was created (Bennett-deMarrias & LeCompte, 1998). Affirming the status quo absolves society of the need to address teacher effectiveness because the present model is believed to be producing to its expectations. Given increasing projections of school diversity, an assumption of universal effectiveness ignores the reality that classrooms will look different, schools will have different conditions, and the actors within will exercise different means of responding to conditions (Parsons, 1937; U.S. Department of Education, 2015). Finally, holding to a singular, universal claim of effectiveness as a paradigm relieves the education research community of the responsibility of thinking and rethinking about teacher effectiveness. The belief that effective teaching is already known, and universally accepted, implies that there is no

new knowledge to be gained or researched on the topic. Therefore, educational researchers are inclined to explore other critical issues in education.

The purpose of this study is to offer a contextualized view of teacher effectiveness through the agency of current teacher educators who have worked in the urban learning environment to conceive effectiveness for that environment. Three essential research questions guide this study: a) What are the effective, and ineffective, teacher typologies found in urban schools, b) What are the essential characteristics of an effective teacher in an urban school as conceived by teacher educators experienced in urban schools, and c) What techniques, deliveries, or styles are associated with effective teaching in urban schools?

Conceptual Framework

This study adopts the lens of critical theory to examine how structures support a society in which dominant groups exploit and oppress subordinate groups through the exercise of hegemony to socialize morality, conduct, choice, and language systems (Gramsci, 1929; Habermas, 1970). Where critical theory assesses explores the hegemony of dominant groups over subordinate groups through the lens of social class, Critical Race Theory frames race, and thereby racism, as a socially constructed tool to advance white dominance (Delgado & Stefanic, 2007). Though coined as a legal and social assessment of society, Critical Race Theory is connected to the institution of education through the scholarship of Ladson-Billings (1998) and Ladson-Billings and Tate (1995). Their pioneering work skillfully acknowledges the significant role that white dominance, and the centrality of race, plays in scripting curriculum, othering of marginalized minority students through deficit-based thinking, and the pervasive myth of colorblindness and meritocracy to explain outcomes that ignore both physical and intellectual opportunity imbalances (Ladson-Billings & Tate, 1995; Ladson-Billings, 1998).

Critical Race Theory in education offers a challenge to the deficit-based meta-narrative of marginalized minority students and can be aligned to culturally responsive pedagogy to affirm the existence of students (Gay, 2010; Ladson-Billings, 1998). Culturally responsive pedagogy affirms assertions of Ladson-Billings (1998) and Milner (2008) that teaching and teacher training--informed by cultural background, assets of the learner, and relationship-building--must be included in the discussion of effectiveness. Noting the principles of culturally responsive pedagogy, Brown-Jeffy and Cooper (2011) affirm the importance of: a) identity affirmation to academic achievement, b) focus on equity and excellence, c) learning and teaching style variations, d) connection of school to home experiences, and e) relationships.

Methodology

Design

This study employs a qualitative approach informed by a phenomenological design that employs semi-structured, open-ended interview questions to answer the three research questions (Creswell, 2013; Moustakas, 1994). The three research questions seek to determine the effective and ineffective teacher typologies conceived by participants, essential characteristics of an effective teacher in an urban school, and the techniques, deliveries, and styles associated with effective teaching in urban schools.

Population and Sample

This study explores the shared experiences of nine teacher educators with significant experiences in urban schools. Significant experience implies five or more years of direct teaching or administrative experience in urban schools. This study uses five years as a parameter for two

reasons: a) to ensure that the participant has had experiences to contribute to the study, and b) research suggests that nearly 50% of teachers leave the profession within five years (Ingersoll, Merrill, & May, 2014). The sample represents a population of teacher educators that are informed by both research and craft knowledge (Haberman, 2010). Participants, 8 women and 1 man, met three criteria for the study: a) must be a current university-based teacher educator, b) have documented research and scholarship with an emphasis related to teaching in urban schools, and c) must have 5 or more years of direct classroom teaching experience or a combination of instructional and administrative service to urban schools. The duality of experience in teacher education and K-12 urban schools, as shown in Table 1, positions participants to provide insight on teacher preparation and urban schools over a broad range of time. Participant names were de-identified and replaced with pseudonyms.

Table 1: Participant Experience and Research Interests

Pseudonym	K-12 Urban Teaching Experience	Teacher Education Experience	Research Interests
Allison	14	25	Mathematics Education; Effective Math Teaching in Urban Schools.
Carol	14	19	Multicultural Education; Urban Education; Literacy Education.
Gwen	13	4	Educator Efficacy; Critical Race Theory; Urban Education.
Isaiah	19	12	African American Students in Mathematics; Teaching Mathematics for Social Justice.
Karen	5	4	Black Feminist Thought, Black Male Teachers, Critical Race Theory; Culturally Responsive Pedagogy.
Lauryn	10	6	Urban Education; Teacher Preparation and Effectiveness; Social Studies Education; Critical Race Theory.
Michelle	10	10	Urban Education; Elementary Education.
Patrice	12	3	Urban Education; Mathematics Education.
Wendy	6	2	Reading and Literacy Studies; Urban Education.

Note. Information for this chart was gathered from the Curriculum Vitae of the participants as of November 2015.

Instrumentation and Analysis

The interview questions in this study are aligned to a research question and one of three categories: a) *interrelations*, b) *experiences*, and c) *descriptors*. Interrelations, used to uncover the participant's experiences and insight on power relations and dispositions, ask questions such as: *What have been some policies and practices at the school site-level that impact teacher effectiveness?* Experiences, which prompts to recall and share experiences such as success stories

in urban schools, asks questions such as: *Can you provide me with an example, scenario, or story of effective teaching in terms of instructional delivery, interpersonal skills, and classroom management?* Descriptors*, words, or ideas associated with an effective teacher ask questions such as: *In terms of attitudes and ideologies, what descriptors that you would use to characterize an effective teacher for urban schools?* The one-hour open-ended, semi-structured interviews involved a baseline of seven questions.

The participants were also provided teacher typologies from established research of Abbate-Vaughn (2004), Haberman (2004) and Ladson-Billings (2009) during the interview, as shown in Table 2. The teacher typologies were prepared as a single document and presented to the participants to stimulate thinking on the prompt and question: *Gloria Ladson-Billings describes six types of teacher behavior patterns: Conductors, Coaches, Tutors, General Contractors, Custodians, and Referral Agents. Martin Haberman describes: Stars and Quitters. Jorgelina Abbate-Vaughn describes three types of teacher ideologies: Quiets, Academics, and Efforts. Who did we miss?* Participants provided their thoughts on the typologies and were asked to offer typologies that they have encountered in their experiences in urban schools.

Table 2: Teacher Typology Prompt

Scholar	Typology	Description
Ladson-Billings[a]	Conductors	● Believes students are capable of excellence ● Assumes responsibility for ensuring excellence
	Coaches	● Believes students are capable of excellence ● Share responsibility with parents, community, and students
	Tutors	● Believes students can improve ● It is students' responsibility to improve
	General Contractors	● Believes improvement is possible ● Shifts responsibility to other resources
	Custodians	● Does not believe much can be done to help students ● Does not seek resources for students
	Referral Agents	● Does not believe much can be done to help students ● Shifts responsibility to other personnel (Special Education)
Haberman[b]	Stars	● Believe success is effort, regardless of background ● Commitment to eliciting, fostering, and rewarding effort
	Quitters	● Believes that there is a "general intelligence factor" ● See removing students as best solution for ideal teaching situation
Abbate-Vaughn[c]	Quiets	● A good classroom is a quiet classroom ● Textbook/worksheet used to resolve discipline
	Academics	● Knowing Shakespeare/traditional curriculum is ticket to college ● Addresses behavior by contrasting it to college-

	bound behavior
Efforts	● Questioning relevancy of knowledge is acceptable ● Includes student background and strengths in lesson

Note. The literature to support the typologies are derived from the following sources:
[a]Ladson-Billings, G. (2009). *The dreamkeepers: Successful teachers of African American children*. San Francisco, CA: Jossey-Bass.
[b]Haberman, M. (2004). *Star Teachers*. Houston, Texas: The Haberman Foundation
[c]Abbatte-Vaughn, J. (2004). The things the carry: Ideology in an urban teacher professional community. *The Urban Review, 36*(4), 227-249

A modified phenomenological reduction was used for analysis. Audio-recorded data was transcribed and horizonalized to identify significant statements (Moustakas, 1994). Horizonalization, as noted by Moustakas (1994), involves taking participants statements and adding them as contributions of knowledge. Horizonalized knowledge became elements of data integrated into meaning units. The meaning units became the qualities, characteristics, and approaches of effective teachers. Meaning units were aligned to support the development of the teacher typology, identified by participants.

Findings

Effective and Ineffective Teacher Typologies

The first research question seeks to gain participant reflections on the types of teachers they have seen, encountered, or conceive in urban schools. The participants provided new/elaborated typologies of teachers, six effective and three ineffective. Allison describes the *Anti-Deficit teachers* as teachers who "always look for the best, the shining examples… put the success stories out there." The continual belief and praise of the shining examples, as described by Allison, comes from the ability to maintain an asset-based view students. Karen adds to Allison's anti-deficit teacher through contributing the *Cultural Pedagogue*, as an effective teacher in the urban schools. The cultural pedagogue is "that teacher who knows who his or her students are and integrate students' cultural background." Karen adds, "I think that's an important type of teacher who's willing to go wherever his or her students are and bring that into the classroom." The anti-deficit and cultural pedagogue represent an extension of *Stars* (Haberman, 2004) and *Efforts* (Abbate-Vaughn, 2004) which display continual willingness to elicit the strengths and contributions of their students. Isaiah adds the element of *love* as an effective teacher type in the assertion of a *Love Pedagogy*. The *Love typology*, as personified by Isaiah, realizes that, "there should be someplace that, even if it's just for one hour a day…that they know that they are loved and they're loved for who they are, what they are, what they have to contribute." Love is positioned as an ideology of *Conductors* (Ladson-Billings, 2009) and *Efforts* (Abbate-Vaughn, 2004) that drives them to create the classroom as supportive spaces that honors student background.

Lauryn, Michelle, and Carol construct effective teacher types in urban learning environments by their commitment to excellence and equity. Lauryn contributed the *Conductor/Coach*, merging two typologies of Ladson-Billings (2009). The conductor/coaches join personal responsibility for student excellence with parent, community, and student responsibility. Lauryn notes,

I don't think it's enough...to just teach....I really think about teaching being so much more than just content, right? It becomes more about also relationships. It becomes more about perspectives. It becomes more about understanding others. It becomes more about community.

Personal and shared responsibility, as noted in Ladson-Billings (2009) Conductors and Coaches, is also present with Michelle's assessment of *Warm-Demanders*, teachers who complement high expectations with strong interpersonal relationships. Michelle attributes her present practices to her early alignment to warm-demanders, stating "I have high expectations for my students even now, but I also spend a lot of time building rapport with my students." Carol, in employing the *golden rule*, encompasses the descriptions of Lauryn and Michelle on effective teaching with a commitment to excellence and equity. The *Golden Rulers*, as contributed by Carol, are teachers who are "willing to treat these students and deliver to them what they would want their own loved ones to have." The Golden Ruler is also closely aligned with Conductors (Ladson-Billings, 2009). These six effective typologies, as actors in the urban learning environment, help ease the conditions for learning within the classrooms.

The urban learning environment can be made challenging by ineffective teacher types that strain the conditions of the classroom. Participants attribute teacher ineffectiveness to either the presence of deficit-based thinking or lack of preparation. Patrice and Gwen offer an ineffective teacher type that advances deficit-based thinking in seemingly sincere ways. Gwen succinctly frames these teachers as the "*Dangerous Minds*,... 'I'm responsible for everything, and I care about them even more than their families do.'" Through Patrice, we find the *Escaper* teacher. The *escaper*, as offered by Patrice, is "the teacher who believes that succeed means leaving your community." As a teacher educator, Patrice uses this typology to inform her pre-service teaching practices. Patrice shares to pre-service teachers that, "if you [future teachers] force your students to make that choice between their people and this college that they know nothing about, they will choose their people." The advice to future teachers is influenced by Patrice's observation of K-12 teachers who "present education as way for you to get out [of their community]." Patrice advises that "you have to find a way to help kids see college to help their people, support their people. Not something to escape [to]."

Patrice's contribution of the escaper teacher is aligned with Gwen's assessment of the *Savior* teacher. The savior teacher, as offered by Gwen, advances a deficit-based mindset that is "adversarial, antagonistic to the child's environment." Gwen notes the savior's mindset as "a weird thing where they tend to think the students are capable, but only under a specific set of conditions… children have potential, but only if you are in the middle of it." Though seemingly sincere, these ineffective typologies are harmful because, as Gwen concludes, they are often "an improper understanding of [their] role in this child's life." The escaper and the savior, as conceived by Patrice and Gwen, represent an extension of the *Academic*, provided by Abbate-Vaughn (2004), which does not invest in the cultural capital of students and only respects singular view of success.

Wendy adds another ineffective typology, the *Overwhelmed* teacher. The overwhelmed teacher "really had great intentions of becoming a teacher…but they're just so overwhelmed that they don't know where to begin, they don't know where to start, and they don't know who to trust either." The overwhelmed typology can be viewed as precursor to *Referral Agents* (Ladson-Billings, 2009), *Quiets* (Abbate-Vaughn, 2004), and *Quitters* (Haberman, 2004). The overwhelmed teacher seeks containment, quieting strategies and fear tactics, and shifting responsibility to others, as teaching tools to control classes. When these strategies fail, the

overwhelmed teacher resolves that nothing can be done to teach urban children, symbolically quitting.

Characteristics of an Effective Teacher

The second research question seeks descriptions, experiences, and interrelations of present teacher educators in their reflection on the P-12 teaching experience and their work with current teachers in urban schools. The participants provide an assessment of essential responsive and impactful characteristics of effectiveness. Effectiveness, as conceived by the participants, is characterized by qualities of *kindness*, *caring*, *love*, *knowing*, and *seeing*.

When asked to describe the effective teacher for urban schools, participants shared significant interpersonal descriptors that characterize responsiveness to learners. Lauryn states that the effective teacher must be "kind and caring…because being kind and caring means that you understand and you accept people for who they are and what they are." Kindness and caring, as descriptors for participants, directly connects with the characterization of love and Isaiah's *Loves* typology. As Karen posits that an effective teacher is "kind. That person would be loving. Not afraid to give my child a hug, especially if they're having a bad day or just to let them know, 'Hey, it's good to see you.'" Isaiah adds that "If you don't love them, you're never able to go into that space."

Along with kindness, caring, and love, participants also characterize an effective teacher for urban schools as *knowing*. Knowing, as a characterization of effectiveness, involves the ability to understand and relate to the individual inner workings of children. Aligned with Karen's' *cultural pedagogue* typology, Wendy effectively captures *knowing* in stating "I want them to know about my child as far as their likes, their dislikes, are they morning person, are they not a morning person, what kind of books do they like to read." Gwen firmly captures this point in stating that an effective teacher is "somebody my child knew every day was looking for him, wanted him to be there, [and] loved him." It is important to note that Wendy and Gwen, when asked to describe characteristics of effectiveness, positions teacher actions that they would desire for a teacher of their biological children. The quality of knowing is also introspective. Teachers who possess a willingness to know and relate to students, regardless of differing backgrounds, can also be effective teachers. Isaiah asserts that "one thing that is paramount is that you have to admit your racial difference." In speaking of successful white teachers of black children in mathematics, Isaiah advises his pre-service teachers that, "if you get up there and pretend we're all the same and that we can throw race out of the window, you're going to fail."

Along with the interpersonal skills of loving, caring, kindness, and knowing, participants conceive effective teaching in urban schools as contingent on the ability of *seeing students*. While Allison finds that effective teachers know "that our kids are smart and can do", she extends this adding that "you've got to know that, not just believe it…then, instilling in them…that you know they have it." From Allison it is gathered that, beyond belief there is knowing, and knowing requires seeing. The notion of seeing students is also aligned with Allison's *anti-deficit* typology. To truly know a student, effective teachers see intelligence, brilliance, and humanity within their students. Carol, invoking the typology of *golden ruler*, succinctly affirms the notion that effective teachers "see that child as a human being who deserves the best that you can offer."

Effective Instructional Delivery and Style

The third research question seeks to uncover observable instructional actions associated with effectiveness in urban schools. The effective teacher in urban schools, according to participants, is responsive to students in style and delivery. In assessing style responsiveness,

participants conceive the effective teacher as one who designs an instructional delivery style that works for their children.

Style responsiveness is flexible in delivery, translational in instruction, and reflective in planning. Instructional approaches of effective teachers place heavy emphasis on, as Michelle states, the ability to be "flexible and willing to adapt their instruction" to the needs of student. Patrice, in alignment with Karen's *cultural pedagogue*, suggests that flexibility in instructional delivery also means that effective teaching is not singular in approach.

The translational approach suggests that the effective teacher constantly works bridge content, what is to be taught and the shared experiences of their children, into meaningful information that makes learning fun and interesting. Bridging content implies knowledge of content, student interests and experiences, and how to connect the two beyond surface level experience. Where Carol posits that effective teachers "makes the curriculum interesting," Wendy extends this notion through the desire that "a teacher that makes learning fun, and I want a teacher that pushes my student to think critically." The translational approach, as described by Carol and Wendy, closely aligns with Patrice's *warm-demander* and Michelle's *conductor/coach* typology. Isaiah adds that the effective teacher for urban learners also knows that intelligence is measured in "a multiplicity of ways." Therefore, effective teachers consistently find ways to present material through multiple intelligences and cultural experiences.

Being flexible in style and translation in approach expresses the idea that effective teachers plan and teach with their students in mind. Isaiah, aligning with the *loves* and *cultural pedagogue* typology, frames the effective teacher as "focused on the child, where the child is, [and] what she or he is intellectually [to] constantly be strengthening that intellect." Focusing on the child requires a level of planning that considers the student and the teacher's approach to reaching them. Participants express that effective teachers in urban schools are also highly engaged in reflective planning. Gwen, on reflective planning, recounts that the "times when I felt really effective. They always had to do with planning…. when I started planning in such a way that it encouraged my students to be more independent." While there may not be a singular style that identifies effectiveness in urban schools, findings suggest that a learner-focused flexibility in style, a translational instructional approach, and reflective planning are elements to effectiveness.

Implications and Conclusion

Effectiveness in the context of the urban learning environment is a product of dispositional and responsive fit. The six typologies of teachers, while different, each display a dispositional sense of responsibility (Silva-Mangiante, 2011) , asset-based perspective of learners (Gay, 2010; Ladson-Billings, 2009), flexibility in style (Brown-Jeffy & Cooper, 2011; Gay, 2010), and a translational approach to learning (Brown-Jeffy & Cooper, 2011). What generally emerges from the effective typologies is the desire and willingness to go beyond the general expectations of a teacher, the willingness to inconvenience themselves. The willingness to inconvenience themselves is also be supported by the observation that participants, particularly Wendy and Gwen, viewed students in urban schools with the same care as their biological children. The identification of effective typologies supported by characteristics and delivery styles in this study also has implications for policy, research, and practice. These characteristics align closely to the work of Rockoff and Speroni (2011) which suggest that subjective evaluations, characteristics, and competencies prior to hire or teaching experience provided more "significant and meaningful information about teacher's future success in raising achievement" than objective evaluations, value-added measures alone (p. 695).

The Willingness to Inconvenience Themselves

The findings of this study indicate that in urban schools, effective teachers appear to be willing to do the things that are inconvenient. In the findings, Lauryn notes "we have to be willing to inconvenience ourselves…that's big in urban education." Effectiveness in this contextual environment involves more than content, test administration, and alignment to curriculum standards. The willingness to inconvenience oneself is align with Gay's (2010) assertion of the "willingness to improvise...to go beyond established templates and frameworks" (p. 145). Participants note that planning with students in mind, taking the time to know and see student talents and incorporate them into lessons, incorporating multiple intelligences into instruction, and adapting instruction based upon student and class dynamics are not explicit in the job description for teachers. These characteristics, as posited by the participants, align to Brown-Jeffy and Cooper's (2011) conceptualization of culturally relevant pedagogy.

Effective urban teachers are effective because they are willing to go beyond expectations, even if it means inconveniencing themselves. Effectiveness, then, should be operationalized to include *inputs* and *actions*, as demonstrated by the aforementioned typologies, characteristics, and styles observed in context. It is important to note including inputs and actions, as mentioned in this study, does not replace one universal narrative of effectiveness for another. Rather, it allows effectiveness to move away from a singular, deterministic approach to teaching. Ineffective typologies, through training or disposition, appear to have a diminished appreciation for interpersonal or adaptive qualities that extend beyond content, test administration, and curriculum standards.

Implications for Policy, Practice, and Research

The findings offer opportunities to engage in collaborative partnerships between teacher preparation programs and urban school leaders, at site and district level. This study utilizes the voices of participants who have professional experience in both teacher preparation and K-12 urban schools. Through a collaborative partnerships, their shared knowledge can be utilized to bridge practices between both learning environments. For the teacher preparation program, their continual observation of the K-12 environment keeps teacher educator practices up-to-date with the realities of K-12 teaching and learning. For the K-12 environment, their observation provides insights on evaluation and development of teachers in practice. Focusing on dispositional and technical characteristics of effective end ineffective teachers, collaborative efforts can be made to develop targeted professional development, improved teacher evaluation instruments, and pre-service experiences. As findings suggest the importance of interpersonal skills and relationships, urban school leaders and teacher educators are encouraged to position community-relationships as valuable resources for effectiveness. Further, identification of effective typologies, characteristics, and delivery approaches has important implications for how effective teacher narratives are told and modeled for teachers, leaders, and teacher educators. This study is unique in that it offers an input-based approach to teaching in a contextual learning environments, K-12 urban schools, from a population of teacher educators that have research and craft knowledge of the urban schools (Haberman, 2010). This study uses their shared experiences in urban schools as elements to conceive teacher effectiveness.

Recommendations

Based on the findings of this study, leaders, teachers, and teacher educators can impact the effectiveness discussion in two ways. First, greater promotion, discussion, and identification of effective teacher typologies, characteristics, and approaches among in-service and pre-service

teachers is strongly recommended. This study notes interpersonal skills and instructional styles that are counter narrative to the universal conception of effectiveness. With the findings generated from teacher educators in this study, researchers and practitioners have multiple typologies and characteristics to add to effectiveness discussions.

Second, it is recommended that school leaders and teacher educators utilize the findings to articulate the type of teacher they wish to develop among in-service and pre-service teachers, respectively. As the findings indicate actions that are driven by dispositions, practitioners and researchers can extend the discussion of effectiveness to include dispositional actions of effective and ineffective teachers. Hill-Jackson and Lewis (2010) note that dispositions can be difficult to detect within an abstract environment, this study contributes a specific context for which dispositional effectiveness can be named and actualized. The recommendations suggested in this study provide an opportunity to consider the context schools in the discussion of effectiveness.

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Enhancing Teacher Efficacy for Urban STEM Teachers Facing Challenges to Their Teaching

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ABSTRACT: This paper explores challenges of teaching in relation to teachers' efficacy for 49 teachers who were part of a year-long teacher development program (PD) called the UrbanSTEM program. This program took place in an urban school district that serves over 300,000 students. This research asked if there are common challenges that urban teachers face when teaching STEM content. If so, do these challenges influence efficacy of teachers, and did the teachers' efficacy change over time due to their involvement in the UrbanSTEM program? Teachers identified external challenges, lack of resources, and organizational contexts having effect on their capacity to address the needs of their diverse students. Although the study did not identify significant relationship between challenges and efficacy, the study did show that this PD was successful in supporting urban STEM teachers by significantly increasing their self-efficacy.

Keywords: Teacher efficacy, personal teacher efficacy, urban teaching, teaching challenges, teacher professional development.

Communities of schools can be categorized generally as suburban, rural, or urban. These contexts have their similarities and differences. For example, while suburban classrooms are largely homogenous in terms of socioeconomic status (SES) and ethnic background, rural classrooms are predominately White (Chapman, 2007). In this study, the term urban is characterized as a school context that is "heavily populated with culturally and racially diverse learners and has a heavy concentration of English language learners, a large number of poorer students, particularly students of color, high attrition of teachers, heavy institutional and systemic barriers, and meager resources" (Milner, 2006, p. 346). Hence, urban school districts face various challenges when providing students' education, and this is especially true for students in Science, Technology, Engineering and Mathematics (STEM) courses where cultural, racial, economic, and gender divides are prominent (Chubin and DePass, 2014). Additionally, this study uses the word "challenges" to label any problematic factor that may affect the teaching and learning process in schools from the perspective of the urban teacher, specifically within the classroom setting.

This paper explores challenges of teaching in relation to teachers' efficacy for teachers who are part of a year-long teacher development program called the UrbanSTEM program. The UrbanSTEM program's goal is to equip and empower STEM (science, technology, engineering, & math) teachers (K-12) to create transformative and relevant learning experiences in urban classroom settings, in order to increase their teacher efficacy, creativity, and pedagogical toolkit. This paper focuses on teachers within this specific context because teachers' efficacy is context

specific (Goddard et al. 2000). Specifically, this study investigated: (a) if challenges persist in the urban school context, (b) how the potential challenges influence the efficacy of K-12 STEM teachers, and (c) if the teachers' efficacy is changed as a result of being in the UrbanSTEM teacher development program.

Context and Ideology of the UrbanSTEM Program

African Americans, Hispanic Americans, American Indians, Alaskan Natives, and Native Hawaiians only represent 9.1% of college-educated Americans in science and engineering occupations (NRC, 2011). The UrbanSTEM teacher development program seeks to counter this issue by focusing on the development of K-12 STEM teachers who teach in urban settings where many of their students are of underrepresented minority groups. The UrbanSTEM program focuses on teachers' abilities to creatively integrate technology into their pedagogies and fostering a sense of competence and community among educators which can make a great impact on student learning and engagement (Goldhaber, 2002; Harris & Sass, 2011), specifically in STEM disciplines.

Additionally, the organization of teacher professional development (PD) in schools and districts is shared and trivial (Desimone, 2009), especially in large urban school districts, where the PDs are brief workshops with unclear importance levels (Sykes, 1999). Such challenges allow for the UrbanSTEM PD program to take a unique approach to teacher PD. This program takes place in an urban school district that serves over 300,000 students. In an urban environment, teacher knowledge and skill sets are important because teachers play a crucial role in the lives of children and need to possess an eclectic array of skills and practices that are suitable to a diverse group of students (Lingam, 2010). However, educators' opportunities to learn new practices and skills are irregular, poorly designed, and shoddily presented (Danielson & McGreal, 2007; Hawley & Valli, 1999).

The UrbanSTEM teacher development program is built on the Technical and Pedagogical Content Knowledge (TPACK) framework (Mishra & Koehler, 2006) and the instructional approach uses the power of experience (Dewey, 1938) involving real world engagement with tools and pedagogies in STEM constructs. This retreats from the idea of simply reading and lecturing as the only modes of learning in school. Additionally, the program follows Dewey's idea that the educative experience should include humanizing the content, so that it is relatable to the learner, and empowering the learner by listening to and understanding what each learner brings to the classroom. An example of humanizing content may start with requiring a language arts high school class that has majority Black and Brown students to read novels that have characters of similar cultural and ethnic backgrounds, or conducting classroom activities that allow students to live the experience of the novel's characters through choice making scenarios. Learning concepts explained by Dewey are also consistent with the framework of culturally relevant teaching where teachers use students' individual strengths and cultural values as a bridge to learning, which is a common practice of successful teachers for students of color (Ladson-Billings, 1995).

Finally, the UrbanSTEM program endorses its most unique element into its PD ideology, which is the stimulation of creativity and wonder within the participating teachers. Seals, Horton, Berzina-Pitcher & Mishra (2016) discuss how the UrbanSTEM program nudges teachers into a culture of embracing failure, treating challenges as an opportunity to try a new approach, and to think outside of the box, especially for simple matters. The purpose of this ideology encourages teachers to have an eclectic approach to their classroom, where they know that one method can

not solve their students' learning problems, but that having multiple methods in their mental tool kits can allow them to be more effective as a teachers to all types of students[1].

Theoretical Framework: Teachers' Efficacy

The origin of teacher efficacy research comes from Bandura's (1977) social cognitive theory that explains human agency and behavior change and from Rotter's (1966) locus of control theory. Researchers on teacher efficacy "do not have a common agreement on how the construct should be conceptualized and measured," (Skaalvik & Skaalvik, 2010; p. 1059) due to the complicated, constant changing, and contextual dependence on what makes teaching and learning effective. The broad definition of teacher efficacy is described as the teacher's perception of his or her own ability to influence student learning and achievement (Ross, Cousins, & Gadalla, 1996; Tschannen-Moran & Hoy, 2001). The teacher efficacy scale (TES) that is used in this study has two constructs: *teacher efficacy* (TE) and *personal teacher efficacy* (PTE). Teaching efficacy is the teacher's belief that teaching is or is not a powerful factor for learning, and personal teacher efficacy is the belief that they (the teacher) can or cannot be effective in teaching their own students (Soodak, Podell, & Lehman, 1998; Tschannen-Moran & Hoy, 2001; Woolfolk & Hoy, 1990).

The influences on efficacy beliefs are based on the four sources of efficacy described originally by Bandura (1997) as (1) mastery of past experiences or previous success in the same or similar task, (2) physiological or emotional arousal felt from completing the task in the past, (3) vicarious experience or learned information about the task by watching others, and (4) verbal persuasion or what others tell you about the task and your ability to complete the task. These four sources of efficacy also apply to how teachers perceive their own efficacy and there have been studies that explore the various items that influence teachers' efficacy specifically (Tschannen-Moran, Hoy, & Hoy, 1998; Tschannen-Moran & Hoy; 2001; Bandura, 1986, 1997).

Skaalvik & Skaalvik (2010) conducted a study that explored the relationship of teachers' perceptions of school context, teacher self-efficacy, teacher burnout, job satisfaction, and teachers' beliefs that external factors influence their ability to teach effectively. By using correlations of structural equation modeling, they found that teacher self-efficacy was negatively related to teacher burnout (emotional exhaustion and depersonalization). Additionally, they found that relationships with parents was a strong predictor of teacher self-efficacy and the depersonalization dimension of burnout. Skaalvik & Skaalvik (2009) also stated that experiencing a lack of cooperation or lack of trust from parents may result in lowering teacher self-efficacy. They also found that time and pressure was the strongest predictor of the emotional exhaustion dimension of burnout and that job satisfaction was directly related to teacher self-efficacy. In summary, this study showed many aspects of teaching have an effect on teacher efficacy, especially relationships with parents and teacher burnout.

Goddard, Hoy, & Hoy (2000) also discuss the factors that influence a teacher's efficacy stating,

> In assessing (self-perceptions of teaching competence), the teacher judges personal capabilities such as skills, knowledge, strategies, or personality traits balanced against personal weaknesses or liabilities in this particular teaching context. The interaction of these two components leads to judgments about self-efficacy for the teaching task at hand. (p. 482)

This statement illustrates many elements that are considered when determining teacher's efficacy. Coupled with the findings from the Skaalvik & Skaalvik's (2009) study, we see a large

variation in challenges that can impact efficacy. Moreover, teacher's efficacy is context specific (Goddard et al., 2000), to the point that it could change from one class period to the next (Ross et al., 1996). This puts an emphasis on the need to study teachers' efficacy in specific contexts while teaching specific content. Hence, when making a "judgement" about teacher efficacy, the context and the content should be considered (Goddard et al., 2000, p. 482). This study aims to throw light on these two specific elements of teacher efficacy (the context (urban) and the content (STEM)) by looking at teaching and learning challenges that may influence the efficacy of urban teachers who teach STEM subjects and then measure if that efficacy changes as a result of participation in the UrbanSTEM program.

Method

The primary research questions that are addressed in this study are: (a) Are there challenges that teachers in urban contexts face when teaching STEM content? (b) If there are challenges, do the challenges impact the efficacy of teachers in urban contexts? and (c) In what ways does the UrbanSTEM program impact teacher efficacy over time?

Participants

This study includes 49 STEM teachers in a large urban school district who are enrolled in the second cohort of the UrbanSTEM program after applying and being selected based on their essay responses, letters of recommendation, leadership, and past teaching experience. Thirty-two (65%) of the teachers identified as female, 20 (41%) of the UrbanSTEM teachers identified as White, 12 (25%) African American, six (12%) Hispanic/Latino, five (10%) Asian. Also, 24 (49%) taught at the middle school level, 15 (31%) taught high school, six (12%) taught elementary, and four (8%) taught at the elementary and middle school level. Finally, 21 (43%) taught science, 19 (39%) taught math, six (12%) taught math & science, two (4%) taught technology, and one was strictly an administrator.

Measures & Procedure

In order to assess if the program meets its intended goal of empowering urban STEM teachers to create transformative and relevant learning experiences, the UrbanSTEM program's researchers assessed the participating teachers' levels of efficacy at three time points across the academic year.

The study consists of several procedural steps. First, the Teacher Efficacy Scale (TES) by Woolfolk & Hoy (1990) was administered to all 49 participant at three time points. The first time point was prior to the first meeting of the year (June). Six months later (December), the TES was administered for the second time, and five additional months later (May), the TES was administered to the teachers for the third and final time. The TES is a 22 item scale with all answers on a six-point Likert scale from strongly agree to strongly disagree. The items that made up the two constructs in this scale, TE and PTE, were mixed throughout the survey. The reliability of the TE construct was .813 and the reliability of the PTE construct was .855; however, the two constructs had a moderate factor to factor correlation of .468.

In order to obtain data about the challenges that urban teachers face, four open-ended questions from an online survey were distributed to the 49 teachers during that second time point (December) only. One of the questions asked the teachers to "briefly describe one or two major challenges that you face as a teacher at an urban school."

Data Analysis

The research team modified the Consensual Quality Research (CQR) method developed by Hill et al. (2005) and used it to analyze the open-ended question about challenges. Hill et al.

(2005) describe CQR as a constructivist data analysis approach that acknowledges that individual realities are socially constructed, and this method allowed the research team to learn about the teachers' teaching experiences through their own socially constructed realities. CQR is also influenced by phenomenology, grounded theory, and comprehensive process analysis. To foster multiple perspectives, three researchers independently read the response data and developed codes. Then through collaborative work, each code was discussed until consensus was built to arrive at the central ideas in the responses. Moreover, two of the researchers collapsed the codes into four common categories that each exclusively represented the types of urban related challenges that teachers were facing, therefore answering research question one. A senior researcher on the project served as auditor "to check the work of the primary team of judges and minimize the effects of groupthink in the primary team" (Hill et al., 2005, p. 3).

After finding the four challenges categories, a mixed ANOVA was conducted that used the four categories as between subjects factors to predict teachers' efficacy. Gender, race, level of school, and subject taught were used as covariates in the analysis with the three time points as the within subjects factor, which answered research question two. Finally, we used the results from the mixed ANOVA test to see if teachers' efficacy changed over the three time points to answer the final research question.

Results

The CQR method allowed the researchers to identify 17 major challenges (see **Table 1**) that teachers face while teaching STEM in an urban context (RQ1). Of the 49 teachers, 45 responded to open-ended question and responded to the TES at all three time points, so all of our data will be based on the 45 teachers. The list of 17 challenges that were identified by respondents were collapsed into four categories, including: (a) *student perception challenges* (n=13), such as how much the students value or prioritize school or content, perceptions of negative stereotypes, motivation, and views of self; (b) *family, home and community challenges* (n=8), such as a lack of support or parental involvement, finances, academic know how, family instability, and community violence; (c) *school and administration challenges* (n=16), including staff cuts, changes, mergers, and expectations from administration, lack of resources and policy restraints; and (d) *student diversity challenges* (n=8) that includes the varying backgrounds in skills, culture, and knowledge of the students. Teachers were placed in one of the four challenge categories based on the primary code from their response. If the teacher's primary code did not fit into the four major categories, they were placed in a category based on their secondary code, or third code if the second did not lead to a category. Please see **Table 2** for examples of quotations from the teachers that fit into the four challenges categories.

To determine if challenges impact the efficacy of teachers in urban contexts (RQ2), the four constructed challenge categories were used as condition groups for predicting efficacy in teachers. Findings from the mixed ANOVA show that there are no significant differences in challenge category in TE, teacher efficacy, $F(3, 41) = 1.89$, $p = 0.15$, nor in PTE, personal teacher efficacy, $F(3, 41) = 0.95$, $p = 0.43$. Additionally, there were no significant differences in TE nor PTE across any of the measured covariates (race, gender, school level, & subject taught). Findings concerning if the UrbanSTEM program impacts efficacy over time (RQ3), using an ANOVA, show that there are not significant changes over time in TE, $F = 0.42$, $p = 0.66$ (see **Figure 1**), but that there is significant change in PTE, $F = 16.47$, $p < .001$, $\eta^2 = .23$, across the three time points (see **Figure 2**). Post hoc results for PTE over time show that there is a significant difference between time one PTE, 95% CI [4.08, 4.54] and time two PTE [4.28, 4.74]

and between time two PTE and time three PTE [4.60, 5.08]. See **Table 3** for descriptive statistics of efficacy across the four challenge conditions over the three time points.

In summary, the results of question one helped to identify the challenges that STEM teachers in urban settings face. However, these data do not show significant differences in a teacher's efficacy based on the four categorized challenges that the teachers were coded, deterring this study from making a strong connection between a teacher's perception of self competence and the challenges that they face in an urban school environment. Yet, the increase in the PTE construct over the year does infer that participation in the UrbanSTEM program is related to this change, which is a central finding to this study.

Discussion

The results of this study affirm some of the many challenges that are chronic to teaching and learning in urban school settings, like staffing schools (Jacob, 2007), the range in diversity of students needs (Zhou, 2003), and the importance of parental support (Jeynes, 2005). The findings from this study, however, do not contribute to the literature on teacher efficacy because the different types of challenges that teachers face in an urban setting did not predict statistically different efficacy scores in the teachers.

Considering limitations of this study, our data is based off of 45 participants. This is not a large participant pool, therefore hurting the effect size of this data. In a future study, having a larger number of participants could assist in finding variation among the four urban challenge predictor groups. Moreover, this group of teachers applied to the UrbanSTEM program and were chosen based off of their essay responses, letters of recommendation, interest in leadership, and by meeting the qualification of having at least three years of licensed certified classroom teaching experience. Though a diverse group of teachers was purposefully selected, this group represents a possibly highly motivated group of teachers and may not show much variation in efficacy levels because they most likely entered the program as confident and efficacious teachers.

The finding of research question three is central to this study because the PTE of teachers did significantly increase over their year of involvement in the UrbanSTEM program for all participants, but the TE of teachers did not significantly change. As previously described, PTE is the self belief that the teacher can be effective in teaching, while TE is the teacher's belief that teaching is a powerful factor for learning. This can be explained by the teaching and learning philosophies endorsed by the UrbanSTEM program. The UrbanSTEM program promotes hands-on learning, encouraging teachers to focus their lessons around the needs and understandings of the students, while creatively using various tools to enhance the teaching and learning experience. By expanding creative pedagogical lenses of teachers, the teachers are becoming more knowledged and empowered to tackle various challenges that they may face, thus explaining an increase in PTE. The UrbanSTEM program is also very sensitive to the environment and context that teachers are in and seeks to inspire pedagogical innovation despite potential shortcomings of their context. TE reflects the teachers' views on schooling as an institution and being effective in educating students despite environmental challenges. Messages from UrbanSTEM stimulate teacher ingenuity, therefore, increasing teacher beliefs in self and not so much increasing beliefs in the system of schooling/teaching.

The changes in PTE over time, though not significantly different, between the urban challenge groups, supports the importance of control when determining efficacy. When looking at the mean PTE of all four of the challenge groups, there is a larger increase in three of the four

condition groups (student perception, school and administration, and student diversity groups). However, there is only a slight growth, from time 1 to time 3, for the family and home group (see Table 3 and Figure 2). Compared to the other three group challenges, family and home challenges are the most external to the school, and therefore teachers have the least control over fixing them. For those teachers who primarily deal with students' family and home challenges, results were consistent with the idea that teachers' efficacy may not be consistent if they are dealing with items that they cannot control, such as students' family and home challenges. Table 3 and Figure 2 show that self perceptions of PTE are lower for teachers when students' family and home challenges are dominant. Moreover, the items that make up the TE construct are related to home challenges that teachers cannot control. An example of TE items includes, "The hours in my class have little influence on students compared to the influence of their home environment," or "If parents would do more for their children, I could do more." The TE construct shows that teachers awareness of items that they cannot control play a role in their TE growth over time, despite which challenge group they were placed in.

Implications and Conclusion

Considering the positive impact of the UrbanSTEM program on teachers' efficacy over a one year period, this paper gives suggestions to researchers and practitioners as to how a PD program could help teachers to increase in PTE (beliefs about their effectiveness as a teacher). However, the UrbanSTEM PD program does not seem to strengthen teachers' TE (beliefs concerning how effective general teaching is for students' learning when considering circumstances out of the teacher's control). Despite the impact of a PD, teachers still work within the context of their school and Tschannen-Moran and Hoy (2002) suggest that teachers make efficacy evaluations by considering the resources and constraints in their specific teaching contexts. This infers that teacher challenges do impact their efficacy, but a few previously mentioned limitations may have kept the findings of this study from supporting that stance. Additionally, this may have practical implications for a professional development program, encouraging that PD instructors design a PD that is very specific to the needs and challenges to the teachers within their context. The UrbanSTEM program does this by providing teachers with purposeful, flexible, and scaffolded real world engagement tools and pedagogies that teachers can use in their classrooms in the context of STEM education in an urban setting, and could serve as a blueprint for future STEM K-12 PD for urban schools.

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Table 1: Urban Challenges Coded from Teacher Responses

Urban challenges
1. Student value of and prioritization of school.
2. Stereotype threat & Self-fulfilling prophecy (concerning STEM).
3. Low student motivation, engagement, apathy (give up easily; over confident kids don't try hard).
4. Student view of self (low self esteem, fixed view of ability).
5. Student diversity (varying backgrounds in skills, culture, knowledge, etc.).

6. Family/home challenges: lack of support/love/finances (kids switching homes; parents can't do math or read well, hands off approach, no buy in).

7. Home/community violence (Safety).

8. Attendance, especially lack of.

9. Student low achievement (Lower reading skills).

10. Teacher motivation

11. Lack of classroom resources (funding materials, lab equipment, etc.).

12. Administrative organizational challenges: CPS staff cuts, changes, mergers, expectations from admin, policy makers restrain teaching, etc.

13. The "right" amount of homework (completing homework).

14. Student workload (involvement).

15. Managing responsibilities as a teacher: work life balance.

16. Classroom management (interruptions).

17. Hidden curriculum: Teacher duties outside of teaching (e.g., calling parents).

Table 2: Number of Teachers in Each Challenge Category

Challenge categories	N	Example quotes
Student perception	13	"Student motivation is the most significant issue that I face as a teacher." "Self-motivation in students. It's difficult at times for some students to independently remain committed to maintaining successful work habits." "Lack of care in students - No student motivation, Nothing is of interest; apathy."
Family, home and community	8	"When parents are not involved with their child's education for whatever the reason (work when their child is home, parent can't help with work because they can't read or they don't know how to do basic math)." "Lack of resources on the student end (no internet at home, lack of food/clothing)."

| Challenge Category		Quotes
School and administration	16	"Administrative turnover: e.g., three different principals and APs in the past 3 years." "Teachers' creativity is limited by content and curriculum directives from administration. "Technology is not updated nor maintained..."
Student diversity	8	"Wide range of skills among students." "One of the biggest challenges I face as a teacher at an urban school is the diversity of my students." "I have students who have vastly different cultural and background experiences."

Note: Includes the number of teachers in each challenge/condition group and quotes from the responses of teachers when asked to describe challenges that they face in an urban school setting.

Table 3: Descriptives of Efficacy Across Teacher Challenge Category Over Time

| Challenge Category	TE			PTE		
	T1	T2	T3	T1	T2	T3
Student perception n=13	4.40 (0.59)	4.21 (0.56)	3.89 (0.99)	4.38 (0.47)	4.63 (0.42)	4.84 (0.45)
Family, home and community n=8	4.11 (0.39)	4.06 (1.14)	4.17 (0.82)	4.25 (0.25)	4.30 (0.63)	4.51 (0.70)
School and administration n=16	4.70 (0.74)	4.67 (0.65)	4.77 (0.78)	4.41 (0.70)	4.65 (0.59)	5.03 (0.66)
Student diversity n=8	4.20 (0.97)	4.16 (0.93)	4.70 (0.64)	4.42 (0.64)	4.55 (0.86)	5.14 (0.37)

Note: Means and standard deviations reported for teacher efficacy and personal teacher efficacy over three time points (June, December, May).

Figure 1: Change in Teacher efficacy (TE) Over One Year
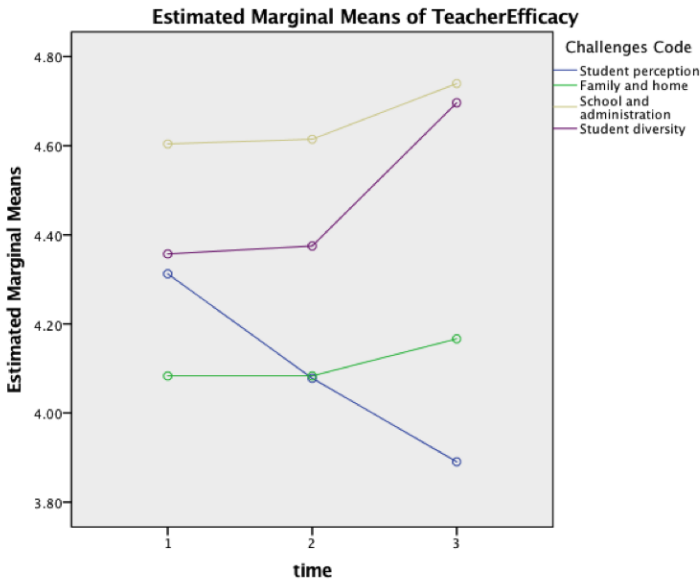
Note: Three time points represent June (1), December (2), and May (3). The estimated marginal means are the means for each group adjusted for the other variables (e.g., race, gender, etc.) in the model.

Figure 2: Change in Personal Teacher Efficacy (PTE) Over One Year
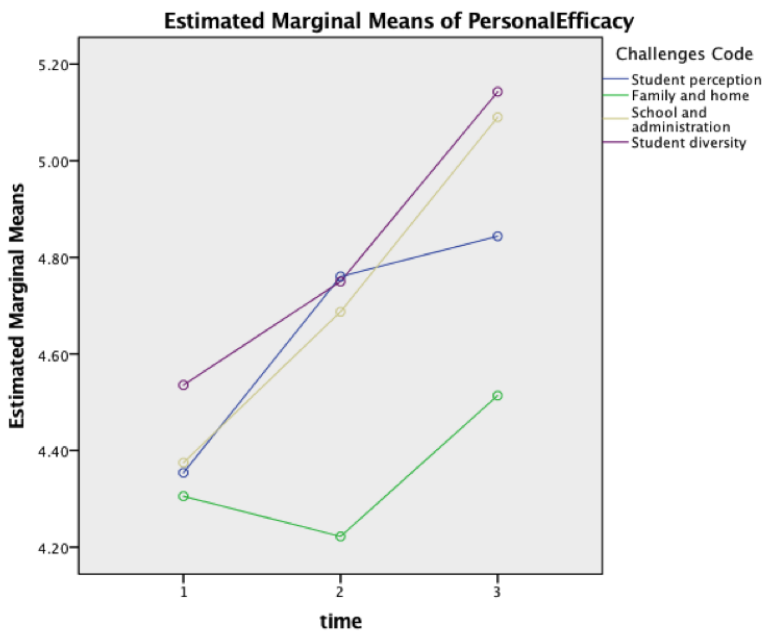
Note: Three time points represent June (1), December (2), and May (3). The estimated marginal means are the means for each group adjusted for the other variables (e.g., race, gender, etc.) in the model.

Urban Educational Change:
Building Trust and Alignment among Fragmented Coalitions of Color

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ABSTRACT: This article is a historical case study of an attempt to build a citywide coalition in Rochester, NY. The coalition wanted to improve urban education by implementing community based wrap-around supports in a similar form as the well-respected Harlem Children's Zone. Our study found that groups had difficulty creating buy-in for this reform effort because of fragmented coalitions, changeover in leadership, and ambitious, yet evolving goals. Political theories relating to coalition building and civic capacity suggest fragmented coalitions can hamper initiatives when bridging between communities of color and power elites fails to take place, but our study suggests additional limitations when varying communities of color are not aligned in their efforts. Our historical case study suggests that strategic development of trust and coalition building is necessary to build civic capacity relating to urban education improvement – particularly between communities of color and power elites, as well as across communities of color.

Introduction

Urban education reform is a complex and oftentimes contentious area. Strategies to align interests in urban areas not only vary by the substance of the reform (Boyd & Wheaton, 1983), but also are highly influenced by the people involved and the human, fiscal, and social resources they draw upon (Hess & Leal, 2001; Stone, 2005). The framing of agendas and development of inter-organizational networks by these individuals (and groups they are connected to) help to inform the research on urban educational change, by further considering the synergy that must exist between purpose and participants. In particular, when operating as "urban regimes," governmental and non-governmental groups are better able to develop long-lasting partnerships and mobilize resources to enact a shared agenda (Stone, 1989). In this article, we use Stone's concept of urban regime theory -- and related literature around power and coalition building -- to study how educational coalitions organize in struggling urban districts to improve outcomes for youth and what hampers their efforts.

This article is a historical case study of an attempt in Rochester, New York to address one of the most resource-"challenged areas of the city in order to improve schools" (Rochester Children's Zone Community Plan, 2007, March). Rochester, located in the northern part of the State near Lake Ontario, is like many northern cities that lost large-scale manufacturing, but managed to recoup jobs through service industries and the post-secondary sector. Prior to the 1960s, Rochester experienced rapid development, growth, and success around manufacturing and was home to several corporate headquarters (Kodak, Xerox, and Bausch and Lomb). However, the 1960s began to see changes, including a decline in the total population by nearly

14,000 people resulting in a total population of 318,611 in 1960 (Warren Hill, 2010, p. 38) with an overall population decline of 34% from 1950 to 2010 (Office of the New York State Comptroller, n.d). Rochester also experienced a shift in its demographic makeup. Most notably, the African American population increased from 7,590 in 1950 to about 40,000 in 1964 (Wadhwani, n.d.). In 2010, Black/African Americans represented 41% of the city residents and Hispanics/Latinos represented 16% of a total population of 209,983 (U.S. Census Bureau).

Many coalitions operated between the 1960s and 2000s, but what is important about the Rochester Surround Care Community Corporation (RSCCC) is that it began with a desire to bring coordinated services through the school district, local government, community organizations (non-profit and for-profit), and churches in a way that had not occurred before – in the form of an urban regime. The initial reform plan called for "widespread and deep change within the Rochester Children's Zone (RCZ) community as well as institutional and policy levels outside of the community" (Jimenez, 2007). Importantly, this effort sought to produce neighborhood-wide improvement for individuals living within a specific area of the city, an area primarily comprised of African American and Latino/a residents.

Our study of RSCCC is guided by the following research question: How did a cross-agency coalition[1] emerge in Rochester around educational equity? What facilitated (or hindered) this coalition's ability to leverage resources toward its educational policy agenda? Through reports, newspaper articles, and other documents, we offer a close examination of who was formally involved in this effort and what seemed to limit the sustainability of these efforts.

Conceptual Framework

Examining urban regimes focuses on *who* is making reforms in a city to understand which reforms are pursued, which are successful, and why they are successful (Shipps, 2003; Burns, 2002; Mitra & Frick, 2011; Bulkley, 2007). As mentioned above, urban regimes involve partnerships among actors and the resources they mobilize. At the root of any urban regime is the idea of power. Power is the capacity to act in terms of both the resources that one might exploit to influence another's behavior and the leadership to mobilize these resources effectively (Stone, Henig, Jones, & Pierannunzi, 2001). Traditionally, the interrelationship of power in the community or community's power structure involves a small group of influential citizens or interest groups competing for a role in policy development. However, research suggests it is important to examine not just this small group of citizens, but also the larger connections across individuals and agencies including the relationships and resources they can enact on social problems (Orr & Johnson, 2008; Stone, 2008).

For an urban regime to function and bring about reform, it must work to establish partnerships, which result in greater civic capacity. Stone and his co-authors (2001) note that for reform to be successful, actors must mobilize around a common objective or agenda. The capacity of a community toward change lies in the ability of key actors to develop a shared focus on community problems with the existence of a broad-based network of both elites and ordinary citizens involved in deliberation and action. The ability to engage a community's civic capacity relies on a variety of institutions and individuals who contribute to a shared vision; participate in the change process; and plan to maintain the community over time (Chaskin, Brown, Venkatesh, & Vidal, 2001; Mitra, Movit, & Frick, 2008; Portz et al.,1999).

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[1] It was originally called the Rochester Children's Zone but was required to change its name and became the Rochester Surround Care Community Corporation (RSCCC). Interestingly it also tried out other names but kept facing legal and piracy issues. The RSCCC was the result of a naming contest (Jimenez, 2009)

Mitra and Frick (2011) argue the *purpose* of an educational coalition and *engagement* in these coalitions are important to consider. The synergy between educational purpose and engagement is an important aspect of considering the multi-sector coalition in Rochester. We were interested in the interagency aspect of these efforts because, as Tate (2012) argues, leaders, reformers, researchers, and educators must move beyond "parallel play." As he points out, "if the goal is to produce a civic regime engaged in a collaborative problem solving journey where success is measured by the amendment of challenging social problems, then interdisciplinary and interagency action should be a point of emphasis in the mode of operation" (p. 524).

We were also focused on the racial dimensions of the efforts because political scholars have argued for a deeper consideration of how race affects regime formation and reform coalitions (Kraus, 2005; Seamster, 2015). Race may play a role with intra-coalition building, especially around trust (or lack thereof) among different community actors (Rusch, 2010). For example, Rusch found that Black group members in Detroit expressed difficulty forging relationships with White organizers, contending that historical racialized power differentials came to bear on how relationships were formed and enacted. The literature from these studies (particularly the work of Rusch, Stone, and Mitra and their collaborators) informed our efforts to understand the evolving civic capacity in Rochester in the early 2000s and how these efforts might inform new coalitions emerging today.

Context

The decision to have the initiative take place in one particular area of Rochester was because it had the most severe challenges of any part of the city, specifically:

- 42% of residents below poverty (compared to citywide poverty of 26%);
- median household income of $19,000 (compared to citywide income of $27,000);
- 8.3% of Rochester Children's Zone residents were unemployed (compared to 5.4% citywide unemployment rate);
- 68% of households were headed by females (compared to 16% city wide); and 96% of students were eligible for free or reduced lunch (13% higher than rest of the District).

Figure 1. Boundaries of the Rochester Surround Care Community Corporation (originally Rochester Children's Zone).

The city of Rochester encompasses one school district, the Rochester City School District (RCSD), serving 28,300 students, 80% of whom are eligible for free and reduced price lunches. The RCSD exhibits the highest poverty rate among New York State's "Big 5" districts (Buffalo, Rochester, Syracuse, Utica, and Yonkers). Importantly, the demographics of RCSD differ greatly from the city and surrounding Monroe county, which is much more homogeneous racially and financially more secure (Table 1). The demographics of areas of the city serving a few schools of RCSD are different from the overall citywide demographics as well.

Table 1: Racial and Ethnic Characteristics of the Larger Rochester Metro Area

	*Monroe County	*Rochester City	**Rochester City School District
African American/Black	15.2%	41.7%	57.3%%
Asian/Native American/East Indian/Other	3.8%	3.6%	3.9%
Hispanic/Latino(a)	7.3%	16.4%	28.4%
White	76.1%	43.7%	10.1%

*Census 2010 **RSCD District Profile 2016-2017

The RCSD has struggled in terms of academic performance for decades. Recently it has a 4-year graduation rate of 51%, the lowest of the five big city districts, and is currently in need of improvement (NYSED, n.d.). The RCSD has also had strained internal race relations (Macaluso, 2006a; Towler, 2007) and was plagued by infighting along racial/ethnic lines (Macaluso, 2007). In fact, newspaper articles documented these tensions which fell along both African American/White and African American/Latino lines, including complaints by African American clergy leaders that not enough black teachers were hired in the district, which had a primarily white teaching staff, and a view that the Latino Superintendent had "locked African Americans out of the district's higher-paying administrative positions" (Macaluso, 2007). It is in this context of a challenging urban community and school district that the RSCCC worked to bring together groups to alter these trends at least in a targeted part of the city.

Two community organizations are important fixtures in the Rochester community given the demographics and needs described above: the Urban-League and the IBERO-American Action League (IBERO). Both came into being after the Rochester Race Riots, which took place in June 1964 and resulted in over $1 million of property damage, 350 people injured, and over 800 arrests (PBS, n.d.). At that time, several organizations were founded that called for changes to hiring practices, housing demands, and eventually educational change (Ares & Escher, 2015; Urban League of Rochester, n.d.).

While the Urban League of Rochester (ULR), an affiliate of the National Urban League, was formed in 1965 to "address the material needs of poor and minority citizens in areas such as housing, employment, health, and economic parity" (Urban League of Rochester, n.d.), it is by and large perceived to be an organization dedicated to the needs and interests of African Americans in the community. The ULR has also maintained a focus on education in several ways. For example, the ULR joined with the Council for Educational Development in 1986 and implored local businesses to participate in the effort to decrease dropouts of RCSD (Urban League of Rochester, 1986). The Urban League also established the Black Scholars Program that recognizes black students in the Rochester area who graduate from high school with a B or better grade average.

The IBERO-American Action League (IBERO) was established in 1968 to provide basic

needs, including food, clothing, and housing to those working in local agricultural work. Today, "IBERO is a dual-language human services agency that teaches individuals of all backgrounds how to become self-sufficient" (IBERO-American Action League, Inc., n.d.). Though IBERO says it supports individuals of all backgrounds, IBERO has primarily focused on educational issues through working with the RCSD to establish bilingual education, including commissioning reports in the 1980s and 1990s with the hopes of improving the educational attainment of Latino students (Ares & Escher, 2015).

Methods

With a focus on RSCCC in the urban context of Rochester, NY, this qualitative study utilizes original source program documents, newspaper articles, and existing research regarding reform efforts that emphasize addressing low performing, segregated schooling in the city to bound the historical case (Stake, 1995). The case is bound by the time that the Rochester Children's Zone was an initiative under consideration (2004) until it dissolved in (2009) as the Rochester Surround Care Community Corporation. In particular, the case study focuses on RSCCC as well as two other community groups: Urban League and IBERO (Table 2).

Understanding what transpired with the RSCCC over its short period of time through a content analysis approach allowed us to focus on the retrospective experiences of the program, but with a focus on the real time ways that events were reported, while RSCCC was getting off the ground and through the various stages, before its demise. This provided us with a lens of "what was" as opposed to the wistful lens of "what might have been." Importantly, by looking at historical documentation of the events and processes, we are limited in our understanding of the events as they unfolded; however, a historical content analysis approach allows for additional community voices to be depicted based on how the local media saw the reform initiative and the kinds of issues that were emerging that were not documented formally by the collaborative.

Table 2: Key Community Organizations involved with the Neighborhood Reform Initiative

Name of Organization	Year Started	Mission	Governance
Rochester Surround Care Community Corporation	2007	To provide an array of social services—health care, child care, family support and education- to improve outcomes for youth and families	Originally a program of United Way and Rochester City School District; later became independent organization
Urban League of Rochester	1965	To address the material needs of poor and minority citizens in areas such as housing, employment, health, and economic parity	Independent Community-based Organization

| IBERO-American Action League | 1968 | A dual-language human services agency that teaches individuals of all backgrounds how to become self-sufficient | Independent Community-based Organization |

Data collection involved locating historic materials, documents, and traditional media sources (Newspapers, Television News transcripts), including "The Minority Reporter," a weekly newspaper in print and online that bills itself as the source of "Community News and Information covering Rochester's African American Community" (Minority Reporter, 2017), and its bilingual sister paper, "La Voz", which exists for "Rochester's Hispanic Community: Our city, our culture, our voice." (Rochesterlavoz.com, 2017). These and other sources were targeted for articles relating to the efforts of this coalition. Data were stored and organized in Dropbox.

Data analysis utilized a thematic approach to content analysis of archival documents and other documents. Analysis involved coding and re-coding of original documents focusing on areas of our conceptual framework relating to coalitions, engagement in policy issues, power dynamics, resources, etc. We also coded for emerging areas having to do with voice, leadership, and race. Our analysis involved systematic coding across sources both thematically (Barbour, 2008; Bernard, & Ryan, 2010; Miles, Huberman, & Saldaña, 2014) and inductively (Charmaz, 2006; Lichtman, 2013).

Findings

In the following section, we discuss the evolution of this cross-sector coalition noting key aspects of leadership, including turnover and conflict that undermined the efforts. In addition, we specifically consider that tensions that prohibited the coalition from sufficiently addressing the underlying racial history and dynamics of the individuals and groups involved.

Rochester Surround Care Community Corporation emerged in 2007 from efforts by the then RCSD Superintendent—a Latino with strong ties in the community—that had started as early as 2005. The initial goal was to model it after the Harlem Children's Zone and the Obama Administration's Promise Neighborhood program specifically "to provide an array of social services—health care, child care, family support and education" (Jimenez, 2007). The initiative was focused on a particular few blocks of the city that included African American and Latino families and was selected because it was "home to the most academically challenged students who are living in the highest concentrations of poverty" (Jimenez, 2009).

RSCCC was originally funded through the United Way of Rochester and school district funds (Macaluso, 2006b). After the two years of planning, funds were provided by the State of New York. The initial iteration of the RSCCC, while it was the Rochester Children's Zone, was overseen by a Design Team led by a RCSD official and was supported by other RCSD staff, area residents, social service providers (including IBERO), and staff from the Mayor's office (Macaluso, 2006b). Notably missing was the Urban League of Rochester, who had attempted "A Call to Action" in 1986, which was also a comprehensive initiative, but one that failed to garner support from the larger community (Macaluso, 2005). Interestingly, the person in charge of the Urban League at the time of the "Call to Action" was William Johnson, Jr., a Black leader in Rochester, who served for 21 years as President and Chief Executive Officer of the Urban League before becoming Rochester's first African American mayor in 1994. He ended his term as mayor in 2005, right as the Rochester Children's Zone initiative was getting off the ground and as a White former police chief was taking over in this role.

While the initial plan that encompassed 40 multi-year objectives and 186 strategies involved the mayor, a social services agency director, and an attorney (Rochester Children's Zone Community Plan, 2007), key business groups were reluctant to participate because of the lead role of the RCSD. In fact, the Rochester Business Alliance CEO stated "I am a strong believer that we don't need to put more funds into the district" when asked about RSCCC (Towler, 2005). One of the reasons for this type of response is that there is a long history of educational reform in the RCSD that has not garnered the desired results, and per pupil spending is a contested concept that many believe is already sufficient. In some ways, pockets of Rochester organizations experience fatigue around the RCSD and want to invest in economic positives that spotlight the best of what the city has to offer. During the initial stages of the RSCCC, there was a general sense that the community, writ large, was not engaged in this as an engine for urban reform and that this reform initiative was purely the efforts of a small, elite, and influential group. An editorial in the alternative newspaper summarizes this view when they pointed out, "there is no widespread community involvement…no insistence that the Children's Zone must be adequately funded and supported" (Towler, 2006). The initiative's own report notes that it would take at least 10 years to realize the vision, suggesting the need for widespread community involvement and commitment (RCZ, 2007).

The garnering of support was also hampered by the contentious relationship between the RCSD Superintendent and the United Church Ministries, an assembly of African American churches (Macaluso, 2007). In fact, the RSCCC group admitted the challenges it faced in developing its vision and plan given the diverging needs and interests and underlying cultural tensions in its plan published in 2007. As stated in the plan, "the Rochester Children's Zone Community Planning process proved to be a complex maze of competing expectations, historical accounts, cross-cultural and cross-class relationships, and social policies" (Rochester Surround Care Community Corporation, 2007, p.13).

Organizationally, the RSCCC experienced several transitions from losing key leaders to shifting the focus and intent of the organization over the four years (2005-2009) that it went from planning to process stages. First, some key supporters left the city of Rochester, including both the Superintendent and the Mayor who were instrumental in bringing the idea to the larger community and garnering support. Both of these leaders believed that the RSCCC would yield improved student achievement over time. Unfortunately, as one community member commented, "nobody picks up the leadership. In many ways, you're seeing the weaknesses in this community: the lack of broad leadership, the sense of contentment" (Towler, 2006).

Another issue that came with their departure was a shift in the mission and focus of the organization. The original intent – perhaps driven by the leadership of the RCSD - was to target schools in the neighborhoods designated as the RSCCC area to serve as resource centers for both adults and children. As stated in the original plan, unlike the Harlem Children's Zone, Rochester's approach "was launched within the Rochester City School system itself, had schools as its initial and primary concern, and expanded into the community" (RCZ, 2007, p. 12). However, perhaps as the United Way became more involved, the emphasis shifted toward coordinating services across agencies in the community (outside of the school system) and the initiative became more focused on "youth and financial literacy, nurturing young children, health care, and community safety for residents …with 21 local agencies who provide the services" (New York State Education Department, 2010). This shift meant that instead of the original purpose that was designed to provide stronger supports to students "24/7" in high needs schools by infusing those schools with community and social services, the schools and schools systems

seemed to move to the periphery in an effort to broaden the involvement of the whole community. In fact, the first RSCCC executive director shared the exact opposite vision of what was in the original reform plan. She was not interested in a focus on schools as a hub for services and claimed that the RSCCC was broader than the Harlem's Children's Zone. Her emphasis was instead on "action teams -- which address health and wellness, parent and youth support, education, community safety, and housing and community development-- [we] must build partnerships with the government and community agencies located in the zone, bring in more businesses to add jobs and offer job training, and garner donations for an endowment that will make the zone self-sustaining" (Jimenz, 2009). This was the first step in the RSCCC moving from being its own organization that worked to bring community services to groups through the schools one that wanted to, as Banister stated, "get business people to come and bring businesses into the zone to invest...You've got to get people to come and live and work and be part of the zone"(Jimenez, 2009). This approach was a radical departure from the initial process that was put in place, even though the mission remained mostly the same.

In addition, the RSCCC evolved from a program to an organization with its own 501c3 status. Initially, the RSCCC Board was made up of five residents of the "zone" and four non-residents, with the stated purpose that it would be "deliberate in advocating for the needs of every individual in this area regardless of race, ethnicity, gender, or social status" (Newell, 2007). However, the Board experienced a tragic loss when one of the resident members was murdered on his way home from a community meeting, which resulted in the residents losing their majority on the Board. This shift became one more way that the organizing principles changed and upset the continuity of the RSCCC.

This was then compounded when the Board and Executive Director had a public falling out in the Spring of 2009 (Jimenez, 2009), and a state audit in 2010 (New York State Education Department, 2010) revealed an acknowledgement of mismanagement of some finances through poor record keeping, among other problems. More recently, a 2015 report on poverty noted that the "by 2009, the initiative had closed its office, beset by upheavals in leadership and infighting" (Riley & Singer, 2015). Despite reference in *Time* magazine (Caplan & Dell, 2007) and an extensive planning and pre-implementation process, RSCCC never moved beyond the process stage and, in fact, continued to be seen in the community as a top-down approach to change that failed to engage community support (Macaluso, 2012), despite the involvement of more than 450 individuals and the "building of cross-cultural relationships – across service providers, institutions, funders, politicians, and residents" (Rochester Surround Care Community Corporation, 2007). The people who were involved in the leadership of RSCCC and how their organizations and agendas steered the direction of the work and consideration of which groups were not represented is critical to understanding this disconnect.

Discussion

Our analysis reveals that when individuals who were central to founding organizations and supporting change initiatives left leadership positions there was a period of unrest with the collaborative. In many ways, what should have become a transition to a more maintenance stage for the organization instead became characterized by infighting as well as a change in the implementation and direction of the mission. Ironically, as the RSCCC became a corporation with the goal of linking multiple organizations to neighborhoods, we found little evidence of meaningful interactions across these agencies or the ways that residents in these areas benefitted. In fact, the engagement of different sectors within this coalition was limited, weakening this

coalition's potential as an urban regime. The local editorial board highlighted "distress signals" including turf wars and political tensions as early as 2008, stating that not only was a new champion necessary but that the group needed to reduce the scale of its efforts, get buy-in from service providers and the new superintendent, as well as acquire more active support from both the mayor and county executive. The newspaper team pointed out that: "a well-planned, broadly supported Children's Zone is the best way to end existence of the two Rochesters - one middle-class to affluent and the other poor like the Wilkins St. neighborhood. Build one community" (Rochester Democrat and Chronicle Editorial Board, 2008).

In the early mobilization phase, education insiders were prominent in ways that undermined the buy-in for the RSCCC in the broader community, such as the business community and local neighborhood groups, because of the status of achievement in the district and perceptions around hiring, fiscal management, and engagement from the larger community. As these key individuals left the initiative, educational "outsiders" took on pivotal decision making roles. While these individuals in many ways were insiders to the area (in spite of being outsiders of the education system) and intimately familiar with some of the challenges, they did not have the same status or power as the original advocates. In addition, the group lacked a strong coalition at any one point of time of both elite and broader community members – and rather seemed to hang in a politically tenuous balance with both groups. Additionally, the coalition seemed to have difficulty penetrating two groups necessary for change in an urban setting: governmental actors and activists (of color or white) who are trusted and can cross racial boundaries.

More recent efforts around urban regime theory has focused on issues of class, yet the history of Rochester suggests that historical constructs around race and advocacy continue to play an important role as coalitions try to bring about policy change. In addressing these racial tensions, Rusch (2010) points to the role of key people, termed *bridging mechanisms*— charismatic and caring individuals who worked to appeal to many types of group members, and were able to keep multi-racial groups focused and united. In Rochester, the lack of continuity with individuals who could serve as bridges across community groups hindered the efforts to develop these kinds of trusting relationships that crossed different cultural communities and in particular, the initiative did not seem to draw upon leaders of color with these types of bridging ties. For those key leaders who were connected to a variety of groups, underlying political tensions seemed to get in the way. However, mobilizing key leaders in the African American and Hispanic community who could have reached out to the groups who had contentious relationships might have increased the number of people actively supporting this community reform effort. Though building upon the United Way's African American Leadership and Hispanic Leadership Development Programs were mentioned as strategies for building capacity neither of these groups were clearly engaged in a formal way with the initiative.

The importance of engaging with issues of race and racism existed throughout the original plan, which emphasized targeting both cross-cutting areas in community safety and health and wellness. For example, the initial report that developed out of community meetings, which began in June of 2006, included the following:

- Ensure that all policies and programs promote racial equity to increase the positive impact on all children in the Rochester Children's Zone;
- Respond to the unique characteristics of racial, cultural, and language groups when developing programs, delivering programs, & communicating with Rochester Children's Zone residents;

- Assess policies and practices (sentencing, incarceration, detention, data reporting) through a racial equity lens to reduce youth violence, crime, and recidivism (repeating criminal behavior);
- Eliminate health disparities (prevalence, outcomes, & interventions) between racial and cultural groups (RCZ, 2007).

However, it was not clear that the collaborative had the leadership capacity to tackle these important areas around racial equity as the steps to reach these broad and vague goals were never articulated. In essence, step-by-step approaches linked to training or decision making or other areas might have built the capacity of RSCCC to ensure that all policies and programs promoted racial equity, but these were not evident.

RSCCC never seemed to move out of the planning stages because of underlying issues of trust, competing interests, and fragmented communities of color, areas which point to structural issues that may very well date back to the race riots (Hare, 2014). Put another way, that two independent newspapers consider Latino and Black populations as distinct populations of readers seems to focus on the ways that these groups are dissimilar. But are there areas that their combined interests around – e.g., the area of racial equity – might have strengthened the advocacy of Urban League and IBERO at a critical time? As urban centers continue to face on-going challenges, it is important that common interests are capitalized upon for successful urban sustainability.

Given the demographics of the neighborhoods targeted by the RSCCC, it might have been useful to develop particular programs, e.g., dual language programs or black parenting programs, at different schools, yet this type of myopic emphasis can prohibit the larger community from widely benefiting, which can also lead to strife. When groups are used to competing for limited resources, they can find it hard to work in cooperation on projects that require a good deal of trust. We found several instances of Latino and African American community members being at odds around educational issues that impacted the ability of the RCSSS to effectively organize and mobilize for educational reform. For instance, the Black community felt that they were being squeezed out of administrative positions within the RCSD based on the hiring of additional Latinos in key roles under the Latino Superintendent (Macaluso, 2007). It is possible that because of a long history of competing for scarce resources and the way that each of these groups have been established as very separate that there continues to be an us versus them mentality. In fact, this tension between Black and Latino citizens has become common across the country, as noted by Hutchinson (2007):

> These days, the tension between the races is noticeable not only in prison life and in gang warfare (where it's been a staple of life for decades) but in politics, in schools, in housing, in the immigration debate. Conflicts today are just as likely -- in some cases, more likely -- to be between blacks and Latinos as between blacks and whites.

While it is not clear that these groups were directly in conflict in vying for different programs or supports since the larger initiative never really got off the ground, these broad trends suggest that it may have pitted programs targeted toward Hispanic students like bilingual education against programs targeted toward African American students, such as an "effective black parenting program" cited in the report (Rochester Surround Care Community Corporation, 2007). This is unfortunate when it is very likely that challenges facing students of color living in the most challenged parts of Rochester cross racial lines. Our findings are similar to a community study that found "tensions and contradictions of black–brown communities" as they sought to work

against oppression (Quinones, Ares, Razvi Padela, Hopper & Webster, 2011, p. 115).

Implications and Conclusion

Through this historical case study, we demonstrate how discrete community groups linked to particular racial/ethnic groups may be limited in their roles in community-wide mobilization efforts and when advancing the educational opportunities for the African American and Latino communities they represent, unless they find ways to be allies. In essence, the power of these two groups was much weaker separately than it might have been had they been aligned in a shared sense of purpose. Together, they might have influenced both the direction of and garnered support for the RSCCC. As the Grassroots Policy Project points out:

> While the experiences of African Americans, Native Americans and immigrants of color have differed significantly, there are a number of parallels in experiences that stem from the racialization of citizenship, immigrant status, labor, and criminalization (p. 7).

This historical case study also shows that part of having a shared focus might mean a clear articulation of more pressing needs. With this initiative, prioritization became a problem because the extensiveness of this plan and competing expressions for which actions to engage in meant that it was not ever able to get fully off the ground.

Nuances of the racial dynamics at play were difficult to tease out in the public documentation of what happened given the nature of what people are willing to publically, put on the record. Since race can affect regime formation and reform coalitions (Kraus, 2005; Seamster, 2015), additional work should pursue this area further to understand the ways that racial tensions among individuals or groups may have been at the core in some of the leadership turnover and the fact that this plan never fully moved to implementation. Community-based initiatives for reform that are in beginning stages will need to do some groundwork at the very beginning to uncover underlying issues and build trust between multiple stakeholder groups, including Whites, African Americans, and Hispanic leaders and communities to allow for authentic community problem solving to occur. Communities engaging in this work would benefit from tools that help to break down structural racism. This would also enable the community to develop explicit goals for addressing racial disparities and to better understand how different strategies may be needed for different communities of color. For example, immigrants who may have particular needs around housing or employment or dual-language students who may have particular needs around language instruction or African American students who may have particular needs around discriminatory policing or discipline practices all require very different support and community resources (see, for example, Grassroots Policy Project, 2011).

A limitation of our study is that it relied on public documents and media reports. Future research could either observe these kinds of initiatives as they are unfolding to be able to capture some of the micro-level processes that shape the direction and trajectory of this type of collaborative. Alternatively, future research might involve interviews with individuals engaged in the initiative in different ways and at different times to dig more deeply into the cross-agency networks that unfold. This could also tease out the ways that underlying racial tensions impact leadership, trust, and sustainability of these type of efforts.

The Rochester Surround Care Community Corporation attempted to reform education in an urban school district by providing wrap-around support services to the neediest area of the city. Unfortunately, this type of reform relies on being able to not only form coalitions but to

have them mobilize resources to tackle common goals over time. In urban communities like Rochester, where political tensions can limit buy-in for broader reform efforts because of fragmented coalitions across racial and ethnic communities, it is important that urban reformers think strategically about ways to build trust and to align goals toward shared purposes in order to eventually build the necessary civic capacity to bring about educational change.

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Faculty Teaching Perspectives about an Urban-Focused Teacher Education Program

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ABSTRACT: This qualitative study investigates the perspectives of faculty teaching engagement in a uniquely designed, collaborative urban-focused teacher education program. The study analyzes interviews conducted with seven participating faculty from both the School of Education and the College of Arts and Sciences in an urban university. The findings reveal critical perspectives including personal and professional transformation and purpose-driven teaching, awareness of the depth of substandard education in urban schools, learning to empathize, embracing culturally responsive and social justice teaching, valuing diverse teacher candidates' cultural assets, and appreciation of cross-unit collaboration. The paper concludes by discussing critical implications for rethinking teacher education for diversity.

Keywords: urban education, urban teacher education, faculty teaching, teacher diversification

The persistent underachievement of students of color and low-income students in urban schools remains a troubling concern (Haberman, 2008; Klein, Rice & Levy, 2012; National Center for Education Statistics, 2011). Reports continue to indict the U.S. educational system for inadequately preparing diverse urban students for effective citizenship development and warn that the failure to successfully educate diverse urban students poses a grave danger to the nation's security (Klein, Rice & Levy, 2012). Economic and national security are often implied in these reports as reasons for the urgency to better prepare diverse urban students. However, while these are important considerations, they are not the only motivation. In a democracy, all students regardless of their demographics, must have access to a quality, equitable, and humanizing education (Nieto, 2000). Sadly, research shows that diverse urban students continue to receive unequal and substandard education due to systemic inequities and institutionalized racism (Oakes, Lipton, Anderson, & Stillman, 2013; Orfield, 2014) that lead to their disenfranchisement, unfulfilled promise, and their ability to read the word and the world (Freire, 1970). The National Assessment of Educational Progress test scores show that minoritized students score far less than their white peers, with at least a 29-point gap in all subject areas (The National Center for Education Information [NCEI] (2011). This is unacceptable and immorally! Some teacher education programs have increasingly begun to respond by enacting programs that are urban-focused to prepare highly competent teachers for diverse urban students. This paper reports on the findings of a qualitative study that investigated teacher education faculty perspectives about their teaching engagement in an exclusive urban-focused teacher education program (UFTEP).

Conceptual Framework

This paper is conceptualized on the importance of teacher diversification and urban-focused teacher education that recruits and prepares highly competent diverse teachers for urban schools. A synthesis of research on urban schools and student achievement continues to raise concerns. Urban students' schooling experiences and academic achievement remain troubling

because of existing systemic inequities and substandard education (Delpit, 2012; Haycock, 2001; Kozol, 1991; Ladson-Billings, 2009; Noguera, 2003). The students lack access to adequate resources, particularly highly competent teachers, due to inadequate teacher preparation (Darling-Hammond, 2012; Delpit, 1995; Gay, 2010; Sleeter, 2008). They also lack access to teachers who look like them, understand their cultural and linguistic codes, connect and relate well to them and serve as role models (Nieto, 1995; Villegas & Irvine, 2010). The concern about the demographic disparity between teachers and students from minoritized communities of color and their academic challenges has called for teacher diversification (Duncan, 2009; National Education Association [NEA], 2004). Haberman (2008) has indicted teacher education programs for preparing teachers who are ineffective with diverse urban students. He writes that "traditional university-based teacher education has demonstrated for over half a century that it cannot provide teachers who will be effective and who will remain in these [urban] schools for longer than brief periods" (p. 1). Some scholars have also indicted teacher education programs for their complicity and culpability in maintaining a status quo program (Cochran- Smith & Zeichner, 2005; Darling- Hammond & Bransford, 2005). Sleeter (2008) notes that most teacher education programs lack coherent and sustained approaches to preparing candidates for diverse urban schools. Teachers have consistently reported that their teacher education programs have not adequately prepared them to teach in diverse settings (Futrell, Gomez, & Bedden, 2003**;** Levine, 2006; Hayes, 2009). Imperatively, colleges and schools of education have been challenged to rethink their programs and to find alternative and creative ways to recruit and prepare teacher candidates of color and with urban life experiences. The suggestion is to evolve an urban-focused teacher education that will prepare teachers who will be culturally responsive and socially responsible. Howey and Zimpher (1989) argue that urban teacher education programs

> [h]ave one or more frameworks grounded in theory and research as well as practice; frameworks that explicate, justify, and build consensus around such fundamental conceptions as the *role* of the teacher, the *nature* of teaching and learning and the *mission* of school in this democracy […]. Programs reflect consideration of ethos and culture building and the critical socialization of the prospective teacher (p. 242).

The diversity gap between teachers and students in U.S. urban schools creates a disconnect that adversely impacts the learning and academic achievement of urban students (NEA, 2009). While 84% of the teaching force is European American (white), students of color make up 48% of the K-12 student population (Boser, 2014). The need to diversify the teaching force has intensified in the last few years (Duncan, 2009; NEA, 2009; Sleeter, Kumashiro & Neal, 2015; Villegas & Irvine, 2010). Some institutions have exemplified efforts to diversify their programs. Sleeter, Kumashiro, and Neal (2015) cited and documented programs such as *Future Teacher Project* at Santa Clara University, *Project Future* in Texas, *Project Teach*, *Teach Tomorrow* in Oakland, *Institute for Urban Education* at the University of Missouri-Kansas City, and *Growing Your Own Teachers* in Illinois, among others.

Context and Methodology

UFTEP is a predominantly White institution, situated within a comprehensive research university located in a large urban community in the Midwest region of the United States. In an effort to respond to the needs of the urban community, and following much criticism of failing to live up to its urban mission, the university established an interdisciplinary, collaborative, partnership-based urban institute to prepare exemplar teachers who would be dedicated, competent, and committed to serving the urban community and its schools. Faculty were selected

from both the School of Education (SOE) and the College of Arts and Sciences (CAS) to design the program and teach the courses. The program's conceptual framework is premised on culturally responsive and social justice teaching. It is cohort-based and targets teacher candidates of color and those with urban life and schooling experiences (Haberman, 2005). Students are recruited locally and nationally, although most come from local urban high schools. Students in the program are full-time students who receive financial assistance. As a cohort-based program, deliberate efforts are made to build, nurture, and sustain close personal and professional relationships among the students. Students take the same classes and function as a community of learners that lends to fostering a supportive "collective identity" or *fictive kinship* (Ogbu, 2004). Because most of the students are first-generation college students and from the local urban high schools with challenging conditions, the program provides a nurturing learning environment to support their success. Specialized courses are designed with an emphasis on culturally responsive and social justice teaching. Some specific courses include introduction to urban education and the urban education seminar, which focus on the sociopolitical context of teaching and learning, culture, diversity, and social justice. UFTEP collaborates with 9 partner urban school districts. Students are immersed in intense, extended field experiences in the schools that begin in the first semester in the program. They participate in a yearlong internship in their final year. One other unique course is the community immersion experience, an eight-week summer intensive course that immerses the students in the urban community. Students participate in various activities, including community excursions, field trips to community agencies, neighborhood walks, service learning, and facilitated reflection and dialogue (Waddell & Ukpokodu, 2012).

I was one of the SOE faculty who was intimately and actively involved in the conceptualization, design, and implementation of the program. I have been a multicultural teacher educator for more than two decades. Prior to the conception and institution of UFTEP, I had founded and instituted the Diversity Curriculum Infusion Program at the university. I facilitated the yearlong Diversity Curriculum Institute that assisted faculty in developing the tools for engaging in curriculum transformation and inclusive teaching. As a critical multicultural teacher educator and the only faculty of color who, for years, had struggled to disrupt the traditional status quo teacher education program, participating in the UFTEP initiative was a dream come true. I designed and taught courses in the program and interacted with the students. In this study, in the eyes of Connelly and Clandinin (2006), I am a researcher-participant. As such, this work reflects a "mutually constructed story created out of the lives of both researcher and participants" (Connelly & Clandinin, 2006, p. 20), which may constitute a limitation of the study.

The overarching research question was: W*hat are faculty perspectives about their teaching engagement in an exclusive urban-focused teacher education?* Seven participants were selected through a purposeful, *criterion-based* sampling (deMarrais & Lapan, 2004). Participants were (1) regular university faculty, (2) had familiarity with the mission and conceptual framework of UFTEP, and (3) had developed and taught one course for at least two cohorts of UFTEP. Of the 7 participants, 5 were from the SOE and 2 were from CAS, 5 were females and were males. There were 6 Caucasians and 1 African American. Five participants associate professors and two were assistant professors. None of the participants had been prepared in multicultural education and culturally responsive/social justice pedagogy in their doctoral programs. Only one participant had been exposed to the works of Paulo Freire and bell hooks. Two participants had taught in an urban school district. Participants' college teaching experience

ranged from 2 years to 30 years. Table 1 shows each participant's profile.

Table 1: Demographic Profiles of the Participants

Name	Race/Ethn	Gender	Affiliation	Rank	Years Teaching	Content Taught	MCE Doctoral Prep?
Bobby	Caucasian	M	CAS	Assoc Prof	25	College Algebra	No
Freddy	Caucasian	M	CAS	Assoc Prof	20	English	Exposed
Lila	Caucasian	F	SOE	Assoc Prof	30	Integrated Arts	No
Maddy	Caucasian	F	SOE	Assist Prof	2	Methods Course	No
Nadine	African American	F	SOE	Assoc Prof	15	Urban Ed Seminar	No
Sally	Caucasian	F	SOE	Assist Prof	3	Literacy	No
Viola	Caucasian	F	SOE	Assoc Prof	30	Children's Literature	No

Although a majority of the participants had not been prepared in multicultural education in their doctoral programs, they quickly learned and came to embrace the philosophy. They participated in a series of professional development seminars and urban community forums on culturally responsive pedagogy (CRP) and social justice teaching (SJT), which were facilitated by well-known critical multicultural national scholars. Some had participated in the campus yearlong Diversity Curriculum Infusion program that I facilitated, prior to the UFTEP initiative. Thus, they had become familiar with the theories and practices of multicultural education, CRP, and SJT. The participants' teaching areas were reading, language arts, mathematics, science, social studies, English composition, and children's literature. Through the SOE collaborative partnerships with 9 local urban school districts that provided field experience sites for students, participants had opportunities to be involved with the schools. Some taught their classes in the schools.

Data Collection and Analysis

The primary data were semi-structured audiotaped interviews. Each interview lasted for about 90 minutes. Interview questions were open-ended. Demographic data were collected that included teaching experience at the university level, courses taught in the program, how they came to be involved with the program, their doctoral program preparation relative to multicultural education, culturally responsive and social justice teaching, and urban school teaching experience. Participants read and signed the consent form to participate. All interviews

were transcribed verbatim and generated a vast amount of data.

Data analysis involved an inductive approach of reading, sorting, and observing for patterns and themes (Patton, 2002). I used a two-stage process that involved initial coding and a focused coding (Charmaz, 2006). I followed LeCompte and Shensul's (1999) stages of (a) isolating specific items and working to label them, (b) looking for and articulating patterns and structures, and (c) clarifying meaning through "linking together or finding consistent relationships among patterns, components, constituents, and structures" (p. 177). Emerging themes were developed by comparing participants' responses both within and across interviews. Although validity is not essential in qualitative research, I established trustworthiness of data through member-checking (Creswell, 2007) and a thorough and prolonged examination.

Findings

Six themes emerged from my analysis of the data. These include experience of personal and praxis transformation and clarity of purpose-driven teaching, awareness of the depth of substandard education in urban schools, learning to empathize, embracing culturally responsive and social justice teaching, valuing teacher candidates' diverse cultural assets, and appreciation of cross-cultural unit collaboration. In the following, I discuss the six themes.

Personal and Praxis Transformation and Purpose-Driven Teaching

Transformative scholars contend that transformation occurs when individuals experience a new phenomenon that changes their perspectives about the way they look at and engage with the world (Dewey, 1933; Clark, 1993; Mezirow, 2000). All participants viewed their engagement with UFTEP as beneficial and transformative, both personally and professionally. Overwhelmingly, participants expressed experiencing personal growth and praxis transformation. Participants expressed that their engagement in the program provided them an opportunity to reflect on and develop a deeper understanding of what real teaching means and their purpose for teaching. They expressed that although they knew why they taught, they developed a renewed sense of a purpose-driven teaching. As Lila stated, "Although I knew why I teach, my teaching engagement with UFTEP really brought it to the fore." Freddy explains, "I was not just teaching a subject to students; I was teaching for a real purpose by preparing teachers for urban schools." Participants also felt their engagement in the program challenged their thinking about what was at stake as they became more aware of the critical need to prepare highly qualified and competent teachers for urban schools. Viola said, "I felt a heightened sense of personal stake given the university's commitment to the program and the local, state, and national sensationalization of the program." Sally elaborates:

> I think my philosophy, pedagogy, and commitment changed because of UFTEP. I made more progress towards my own journey of understanding well what it does mean to teach, and how to prepare pre-service teachers for urban teaching. For the most part, teaching in this program has been an asset to the overall quality of my college teaching. I thank the students. It is a huge responsibility we are preparing them for and the desire to fulfill it is great, so as an instructor, you adjust your philosophy, disposition, and pedagogy.

Awareness of the Depth of Substandard Education in Urban Schools

Haberman (1991) describes teaching in urban schools as a "pedagogy of poverty" that is characterized by low expectations and worksheet curriculum that produces low-level knowledge. This became obvious to participants as they worked with the UFTEP teacher candidates who graduated from the local urban school districts. Participants learned firsthand the depth of the

educational challenges in urban schools, and how the substandard education the students receive is a disservice and that it shortchanges them. All participants lamented the academic weakness of some of the UFTEP students and its effect on their learning and performance. Participants felt a tremendous frustration and outrage that schools would graduate high school students without developing their critical thinking and literacy skills. Some participants described the experience as "a shock," "an outrage," and "eye-opening." They expressed experiencing tremendous challenges and frustration teaching some of the UFTEP students. Most of the students came from the so-called "failing" local urban school districts. However, all participants perceived the students to be intellectually capable, motivated, committed, and with great potential. The following comments illuminate:

> The students come from the urban core where the educational system and curricular experiences have not been rigorous. So you have students who have tremendous potential but poorly prepared. The writing is very weak. Oftentimes they have not been challenged. I remember that first group of students—they were such, I mean, they were like... it was like teaching high school students. I felt like I was teaching a group of students who really needed to learn to know what college was all about, so it was frustrating.

Says another,

> Well, I think it goes back to their K-12 education. For some of them they really come out of schools where the teachers did not really teach them or try to help them learn how to learn and where academic discipline kind of things were not impressed upon them. And a lot of these young people are, they are, the first person in their family to go to college, which I am glad about. Many have good disposition toward the program but I think they don't come out from educational backgrounds where there was academic rigor. They have not been challenged and instilled the value of rigor in their studies.

Learning to Empathize

One key quality of a true educator is the ability to empathize with others upon knowing their plight or recognizing injustice. As participants deepened their awareness about the failure of the educational system and the schools to effectively provide a high-quality education for urban students, as well as observed that the UFTEP teacher candidates had potential and exhibited a high sense of determination, motivation, openness, and commitment to their preparation as urban teachers, they began to shift their mindset. All participants agreed and realized that it was not the students' faults that they had academic challenges; they blamed the schools and teachers for shortchanging them. They felt a sense of empathy not only for the UFTEP students but also for all students in urban schools. Participants felt the sense of empathy positively influenced their frame of mind and diminished their feelings of frustration. It sustained their ability and determination to commit genuinely to helping the students learn and succeed. Viola illuminates,

> My engagement with UFTEP was a humbling experience. It forced me to reflect on my own education. While I feel gratitude for the quality education I received, I feel disheartened by the experience these [UFTEP] students have received and I feel their pain when they are challenged by the assignments they complete in my class. I just have to empathize with them. When you think of the interest of those least prepared students, it breaks your heart. In each of the UFTEP classes I taught, there have been some students who just were academically weak. A few of them were fine… I had to be genuinely compassionate toward them and determined to help them succeed.

Embracing Culturally Responsive and Social Justice Teaching

All participants expressed lacking preparation in multicultural teaching, as they were not

exposed to multicultural education during their doctoral programs even though some who were recent graduates acknowledged not having that preparation. Some participants earned their degrees in the 1960s and '70s prior to the popularity of multicultural education scholarship. Lila explains,

> I went to school in the Midwest in late '60s and early '70s. There was no talk about multicultural education, cultural responsiveness and social justice. When I started teaching college in the early '70s, I just taught from a technical stance. As you know, the last few years we have focused on this program [UFTEP] and I am learning about culturally responsive teaching and social justice.

> Only one participant had some readings on Paulo Freire and bell hooks from which he became knowledgeable and passionate about social justice education and pedagogy. However, while not all participants, especially those from the CAS, understood or believed in the theory of culturally responsive teaching most did reference making efforts to teach in a way that modeled elements of culturally responsive teaching in their courses. It is important to note that these participants were experts in their content areas and were already teaching courses in the regular teacher education program or general education program. The hope was that through the professional development workshops they would learn to embrace multicultural/culturally responsive teaching practices.

Valuing Teacher Candidates' Diverse Cultural Assets

All participants expressed valuing the diversity of the UFTEP students and felt stimulated and humbled in their presence. They felt the students' diverse cultural backgrounds and "funds of knowledge" (Moll & Gonzales, 2004) enriched and enhanced the teaching-learning process and found it refreshing as it was a rarity in other non-UFTEP courses they teach or have taught. Sally commented,

> I liked and enjoyed the diversity of the students in the course. My other courses lack diversity so it was refreshing and exciting to teach the UFTEP students. The perspectives they shared were enlightening. They were open to diversity issues and readily engaged in dialogues and discussion about culture and social justice. The students took initiatives in raising issues about diversity and curriculum and teaching practices.

Maddy echoed,

> Working with UFTEP students has given me more of a base to work from. The students come with critical consciousness and their voices have improved the dialogue in my class. Because of them I have more diversity in the room and that has been a great change in the past two years, and that is a good thing, and if I say something about the children's culture and who is represented in these books, they are able to talk about the relevance of the resources and what works best for diverse students. So you definitely see the leadership in them. They also have great attitude toward diversity and their desire to serve urban children is revealing. They bring liveliness, engagement, and confidence into the room.

Appreciation of Cross-Unit Collaboration

One key feature of UFTEP is its interdisciplinary, collaborative, and partnership-based structure. Collaboration involved CAS faculty who served as members of the writing and design teams of UFTEP. They also developed and taught innovative courses that integrated the "funds of knowledge" of the urban community. For example, English composition course assignments involved researching and analyzing the history of racial segregation and patterns of redlining. Integrated content and methods courses were designed and taught collaboratively. Team teaching

fostered co-learning between CAS and SOE faculty. Participants commented about valuing the collaboration between SOE and CAS faculty. Some CAS faculty felt they had learned so much about pedagogy from the collaboration with SOE faculty, reading literature they never would have read, and becoming deeply knowledgeable about teacher education language. Some even felt they were evolving as "teacher educators." Consider this comment:

> My engagement with UFTEP has been professionally enriching. Being able to collaborate with SOE faculty has given me much knowledge on teaching and learning. Participating in those writing and design team meetings, and being exposed to the teacher education literature was incredibly enlightening. I read Ladson-Billings' articles on culturally responsive teaching and listened to my SOE colleagues talk about social justice teaching. Even though I am still learning about this, I find myself using some education language and so feel like a "teacher educator."

SOE faculty also expressed valuing the collaboration with CAS faculty, learning about the CAS faculty's experiences teaching their courses through the lens of culturally responsive and social justice teaching, and their experiences with UFTEP students compared to their traditional students. Lila illuminates:

> Collaboration with CAS faculty was very good for this program. It was good learning about their discipline and courses and how they were encountering the program students. First, it was good to hear that they have the same experiences, like the frustration, we have with the students' limited academic and college readiness. Second, it was good to see how they were structuring their courses and pedagogy to meet the needs of the program, you know, social justice teaching, how they make students explore and write about their neighborhood geo-histories. Third, I like the collaborative cross-curricular development that we have.

Nadine added,

> It was great that we collaborated with CAS faculty. I liked the fact that CAS and SOE are beginning to be on the same page. You know that they are laying the foundation for a good liberal education and introducing issues of culture and social justice to the students so that they are not new to them when they come to our education courses.

Challenges of Program Teaching

Although the participants found their teaching engagement with UFTEP valuable and rewarding, it was not without challenges. One paradoxical challenge the participants faced was the culture of "them vs. me." Although the students were culturally and racially diverse (Caucasians, African Americans), they had developed a "collective or fictive identity" (Ogbu, 2004) that created a "cliquish" culture in class. As a cohort-based program, UFTEP teacher candidates experience the same classes and extracurricular, cultural and social activities. They are socialized to function as a "family" who support each other and bond together. Given this support and connectedness, UFTEP teacher candidates develop a high sense of empowerment and "voice." All faculty reported experiencing some frustrations because of the students' overpowering "cliquish" culture that somewhat divided the class into "me" (faculty) versus "them" (UFTEP preservice teachers). Some participants felt threatened and even intimidated by the "cliquish" culture. Maddy, who was White, with just two years of teaching experience, felt particularly impacted. Her comment illuminates,

> Honestly, there were times during the course when I felt intimidated by the students, you know, the way they bonded together and came to each other's defense, especially if an issue came up between one of them and myself. I felt like the "outsider" and had trouble

connecting with them. At first, I thought it was a cultural or racial thing because I was the minority [white and non-UFTEP] in the class. I will not be way off if I say I was marginalized by the students especially the first group. It was much better the second time teaching in the program, because I devised new strategies to break through the "me" versus "them." I have since learned to be proactive and to make clear to them the whole notion of professionalism, responsibility, and learning community. So it has gotten better!

Another major challenge participants noted was institutional constraint. The UFTEP program was promoted as a national model. There was so much riding on its success. It was the chancellor's project and was monitored from the provost's office. Participants felt pressured to deliver, to ensure that the teacher candidates were successful and retained. There was high expectation for both faculty and teacher candidates. One of the marketing points for UFTEP was the high academic performance and success of the teacher candidates. The grade point averages (GPAs) of all UFTEP teacher candidates were constantly reported as excellent and higher in comparison to the candidates in the traditional program. Participants felt pressured and challenged to make sure that teacher candidates in their classes received high grades even if they had to redo assignments multiple times, which added to their workload. A few participants reported being removed from teaching courses for UFTEP because they were "too hard" and gave low grades to students, which lowered the students' GPAs.

Discussion and Conclusion

This paper has presented faculty perspectives about their teaching engagement in one institution's urban-focused teacher-education program. The findings generate critical perspectives that have implications for educational practice at the K-12 level, as well as college and teacher education. First, the participants' first-hand experience of the academic challenges UFTEP preservice teachers face gives insight into the problem of recruiting and retaining teachers of color. Teachers of color constitute about 17% of the teaching force (National Center for Education Statistics, 2011). One reason for the low representation is lack of adequate college preparation (Neal, Sleeter & Kumashiro, 2015) and unwelcoming college culture (Harper, 2006). This study shows how faculty responded to the call to serve the local community and collaborated to design and enact a unique program that recruited and nurtured young adolescent teacher candidates for teaching responsibilities in urban schools.

Second, this study reveals the importance of faculty personal and praxis transformation needed to successfully prepare and retain students of color who enter our college classrooms, particularly in teacher education. Although participation in the UFTEP was a novel teaching terrain for most participants, they embraced the challenge and learned to navigate and negotiate the demands of teaching young adolescent students from marginalized urban school communities. They learned to adjust their dispositions toward teaching in new ways and for a new cadre of students. Traditionally, students entered the teacher education program after two years of liberal arts education. The UFTEP students entered the teacher education program in their freshman year—right out of high school. Most participants were not accustomed to teaching freshmen students in teacher education. They learned to be compassionate and patient, and cultivated a new mindset to navigate and negotiate interactions and relationships with students. They also learned to become "warm demanders" (Gay, 2010), scaffolding students' experiential learning. Perhaps because of the high stakes of the program—the chancellor's project—and the heightened awareness of the educational crisis in urban schools, all participants felt invested in the students and the program. Participants saw themselves as contributing to a larger cause:

preparing teachers for the urban community and changing lives. Participants were passionate in their description about the work with the students and they were genuine in their commitment to the students' success. Some were both teachers and mentors to students. They participated in social activities that were organized to nurture the students. When faculty begin to see the world from students' realities, they are more likely to see how the dominant educational system has affected their lives and education. All participants expressed "feeling with" the students and pledged to support their learning. Viola illuminates,

> I really had to adjust my attitude and pedagogy. I had to be patient, compassionate, and caring. I now see the gross disservice done to urban students; this has challenged my desire to commit and ensure that these urban preservice teachers are adequately prepared. I think this is what college faculty should know so that they can better help these students, many of whom are first-generation college students.

Third, this study confirms the benefits of diversity on college campuses. Participants commented passionately and positively about valuing UFTEP preservice teachers' diverse backgrounds, which contributed to classroom liveliness, learning stimulation, energy, diverse perspectives, and increasing perspective consciousness of other education students. Finally, the participants' sense of humility, as they learned to embrace and negotiate the new terrain of culturally responsive and social justice pedagogy, is encouraging. Although most participants were not grounded in multicultural education and culturally responsive and social justice pedagogy prior to engaging with UFTEP, they soon realized the high stakes of the program and so challenged themselves to embrace and learn to teach in a culturally responsive way. This is what the Association of American Colleges and Universities (AACU) has challenged faculty to do.

Fourth, the collaboration between CAS and SOE faculty is encouraging. Collaborating on designing creative and innovative courses and sharing ideas about teaching and students' learning are worthy outcomes for emulation in our institutions. This was a rare experience prior to the inception of UFTEP. However, while participants felt positive and humbled by their teaching engagement with UFTEP, it was not without challenges. Participants' expression of experiencing "them vs. me" culture in their classes exposes issues of racial/cultural identity that faculty must work through in order to be competent with students from marginalized backgrounds (Cochran-Smith, 2004; Nieto, 2005). Although the participants participated in professional development to learn about culturally responsive and social justice pedagogy, they may not have had opportunities to develop the multicultural competence needed to navigate and negotiate cross-cultural teaching (Irvine, 2003; Nieto, 2005). Faculty, especially teacher educators, must develop multicultural competence and unpack their racial/cultural identities in order to meaningfully engage diverse others and create and sustain a learning classroom community. More importantly, teacher educators must be grounded in critical multicultural education if they are to develop the knowledge, skills and dispositions needed to effectively interact with diverse teacher candidates and prepare them for transformative practices. It is somehow disturbing that some participants who were recent graduates from their doctoral programs did not have preparation in multicultural education. Teacher education programs must disrupt this omission but also to ensure that they provide professional development for all faculty preparing teachers and teacher candidates. The findings will be valuable to urban-focused teacher education programs, as well as teacher education in general that seeks to diversify the recruitment and retention of teacher candidates.

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Maximizing Opportunities to Enroll in Advanced High School Science Courses: Examining the Scientific Dispositions of Black Girls

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ABSTRACT: Diversifying the STEM workforce is a national concern. To address this concern, researchers, policymakers, and educators are working to increase STEM career interest and achievement in a more diverse population of learners. Black girls and young women represent a unique population of STEM learners that remain relatively untapped and largely under researched in current STEM education scholarship. Therefore, this study focuses on the relationship between the science dispositions of Black girls and advanced science course enrollment. The present study utilized a sample of Black female students ($N = 1,810$) that participated in the High School Longitudinal Study of 2009/2012 (HSLS:09/12). To examine whether science dispositions are predictive of general enrollment in advanced science courses a canonical correlation analysis (CCA) was performed. The observed relationship between science dispositions and participation in advanced science of $r = .389$ and explains 15.13% of the variance. The majority of the predictive information for the science disposition construct was observed in science identity. Therefore, the development of science identity in Black girls should be the focus of educators and parents seeking to increase Black girls' participation in advanced science courses. Implications are provided for parents and educational stakeholders of Black girls.

Diversifying the STEM workforce is a national concern. Many U.S. jobs in STEM fields remain unfilled due to a lack of quality workers (Atkinson, 2013). Demographic trends and STEM participation rates suggest that, rather than relying exclusively on students who have already demonstrated high achievement to pursue STEM education, the U.S. needs to inspire, engage, educate, and employ as broad a population as possible in STEM-related professions (Ranis, Means, Confrey, House, & Bhanot, 2008). To address this concern, researchers, policymakers, and educators are working to increase STEM career interest and achievement in a more diverse population of learners. Students in urban schools have the potential to help diversify the STEM workforce. Unfortunately, many of these students lack access to the resources and support necessary to matriculate through the STEM pipeline. Research in urban

education provides evidence to support this assertion as it related to Black students in general and Black male students specifically (McGee, 2013; Rogers-Chapman, 2014). However, Black girls and young women represent a dually marginalized population of STEM learners that remains relatively untapped and largely under-researched in current STEM education scholarship.

Black girls possess many characteristics that can support their persistence in STEM courses and professions. The odds of being interested in a STEM career are almost three times higher for males than for females (Sadler, Sonnert, Hazari, & Tai, 2012). However, many Black girls have a strong affinity for STEM professions that is often not affirmed or, in the extreme case, discouraged. According to Hill, Corbett, and Rose (2010), despite early interest, Black women face unique obstacles in STEM, including teacher bias and poor institutional support for pursuing STEM. This is important given the historical under-representation of women in general and women of color in particular in STEM.

Approximately 75% of American scientists and engineers are White, and only 10% of STEM professionals are women of color (Feller, 2012). These positive STEM attitudes can be leveraged to redress these trends to increase Black female STEM participation. Additionally, non-traditional gender achievement socialization patterns have propelled Black girls and young women to consistently outperform their male counterparts in most STEM related academic tasks. Black girls outperform Black boys in every measured academic domain (Varner & Mandara, 2014). This phenomenon is often attributed to the gender socialization of Black girls compared to their non-Black female peers.

Empirical evidence suggests that parents raise their daughters and sons differently (Bornstein et al., 2008). However researchers suggest that Black mothers foster competence and self-reliance in their daughters, thus they are firmer with their daughters than their sons (Collins, 1987; Staples & Johnson, 1993). These gender socialization patterns translate into the higher academic performance of Black girls compared to Black boys. For example, Black student achievement on tests is directly related to differences in parent socialization based on gender (Wood, Kaplan, & Mcloyd, 2007)). Subsequently, 59% of Black girls graduate from high school compared to only 48% of Black boys (Lewin, 2006). Given these unique intrapersonal and academic characteristics observed in Black female students, it is important to assess how these constructs are related within the STEM education domain.

Purpose

The objective of this study was to examine the relationship between enrollment in advanced high school science courses (Advanced Placement (AP) and International Baccalaureate (IB)) and science dispositions (e.g., identity, utility, self-efficacy, and interest) in a representative sample of Black female high school students. Often students of color (Black and Hispanic) are not afforded opportunities to enroll in such classes compared to White and Asian students. National Science Foundation data shows that Black women and girls are under-represented, given that they comprise only 10.4% of the female graduates in STEM fields (National Girls Collaborative Project, 2013). This study is of importance because the scientific dispositions of Black girls are sparsely examined in the literature. Black girls are a uniquely diverse and academically resilient population of learners. Therefore, highlighting the usefulness of disposition data to inform the recruitment and retention of Black girls and women as potential STEM learners and professionals is paramount.

Conceptual Framework

Science dispositions are integrally related to enrollment and achievement in advanced science coursework and subsequent STEM achievement and careers. Wang (2013) posited that readiness in mathematics and science, in particular, is correlated with students' decision to choose a STEM major. Students who participate in rigorous mathematics and science courses in high school are more likely to both pursue and complete degrees in STEM fields (Schneider, Judy, & Mazuca, 2012). This trend is true for Black students; however, many attend schools that do not offer advanced mathematics and science courses (e.g., AP classes) pivotal to college STEM success (Tyson, Lee, Borman, & Hanson, 2007).

In addition to being academically prepared for STEM fields, Black girls must also possess positive dispositions toward STEM content. Preparation and dispositions are integral to STEM success. Prior research suggests that STEM dispositions vary by race and gender, with Black women having more positive attitudes toward STEM than other female racial groups (Hanson, 2009). This is important because, while it demonstrates Black girls' positive dispositions toward STEM, external forces may taint their interest. Students who face multiple levels of minority status, particularly Black women, contend with additional challenges of dual stereotypes and power inequities. This creates 'multiple jeopardy' for Black girls whose gender and race may influence how they are perceived within STEM classes. According to Francis (2012), teachers perceived Black girls as disruptive and were less likely to recommend them for honors courses (Campbell, 2012). Black females are also under-referred for gifted education and AP classes (Ford, 2013); under-referral exists even when Black students have the same academic profile as White students (e.g., Grissom & Redding, 2016).

Although the first step in creating opportunity for Black girls is making advanced classes available, it is not sufficient for diversity or inclusion in STEM. Educators must understand that decontextualized learning does not foster a strong science disposition among students, but introducing high school students to a strong sense of the utility does (George, 2003). Science utility refers to an understanding of the 'usefulness' of science; students must see a purpose and relevance, personally and professionally. Additionally, prior research shows positive outcomes when students are presented with rigorous curriculum, positive academic engagements and hands-on science learning experiences on 'what it is to do science' (Ero-Tolliver, 2013). These activities reaffirm student's knowledge, increase their persistence in STEM and strengthens their science identity, the students' belief that they are a 'science person' (Hunter, Laursen, & Seymour, 2006). Differences in STEM interest vary across race and gender. Trends in gender differences in STEM interest and achievement suggest that males are more interested and proficient in STEM despite similar gender enrollment trends (Choi & Chang, 2009). However, racial differences exist -- 62% of Black students express disinterest in STEM fields (Business-Higher Education Forum, 2011). Some students did not enroll in advanced classes because they were unaware of the opportunities or experienced lack of confidence in their capabilities (Darity et al., 2001; Young, Ortiz, & Young, 2017; Young & Young, 2015; Young & Young, 2016). Therefore, all educators should value the unique science utility, interests, identity differences, and cultural capital of Black girls as they expose them to what it means to engage in STEM.

The relationship between science dispositions and science course enrollment has important implications for the sustained participation of Black girls in STEM. Pre-college experiences, previous coursework in high school, race, and gender are all crucial to a student's science disposition and career decisions (DeMarie & Aloise-Young, 2003; Gordon & Steele, 2003; Larke, Webb-Hasan, Jimarez, & Li, 2014; Simpson, 2001). Thus, it is imperative that

educators place special attention and consideration on the relationship between Black girls' science dispositions and science course enrollment. Although gender parity in high school math and science enrollment is more common than ever, significant enrollment disparities across different races and socio-economic levels persist. Therefore, our study focuses on the relationship between the science dispositions of Black girls and advanced science course enrollment.

Methods

The present study utilized a sample of Black female students ($N = 1,810$) that participated in the High School Longitudinal Study of 2009/2012 (HSLS:09/12). Students were randomly selected from a pool of over 21,000 students from 944 public, charter, and private schools in the United States. The base year data collection included online surveys administered to students, parents, science teachers, and administrators. In subsequent follow-up administrations, similar online surveys were administered to parents and students. These variables represent the independent and dependent variables examined in the present study.

To assess the construct validity of the HSLS:09/12, researchers conducted a principle components factor analysis (Ingles et al., 2014). In the present study, we examined the following scales: (a) Science Efficacy Scale (X1SCIEFF); (b) Science Interest Scale (X1SCIINT)(c) Science Identity Scale (X1SCIID); and (d) Science Utility Scale (X1SCIUTI). The reliability of these scales as measured by Cronbach's alpha ranged from .69 to .89. The aforementioned scales were standardized to a mean of 0 and standard deviation of 1. To assess the relationship between this variable set and participation in advanced science, we utilized two outcome variables (1) Enrollment in AP science and (2) International Baccalaureate (IB) science courses. Enrollment in AP science (S1APS) is a dichotomous variable that asks students if they plan to enroll in AP Science. Responses were statistically constrained to "yes" or "no." Similarly, enrollment in IB was dichotomously scaled using this question stem.

Analysis

To study the relationship between Black girls' science dispositions and enrollment in specific advanced high school science courses, the correlation matrix and partial correlations between all predictor and dependent variables were obtained. Then, to examine whether science dispositions are predictive of general enrollment in advanced science courses a canonical correlation analysis (CCA) was performed. CCA was chosen because the purpose of the analysis was to assess the ability of the set of science disposition predictor variables to predict a separate set of variables representing general enrollment in advanced high school science. Because the objective was to assess the relationship between variable sets, CCA was the most appropriate analytic technique. Furthermore, the multivariate nature of CCA limits the probability of committing a Type I error. In theory, we could conduct two separate regression analyses. This would increase the "test wise" error rate, thus it was avoided. Figure 1 presents a pictorial representation of the relationship between the two variable sets modeled in this study. Data were analyzed in IBM SPSS Statistics 20.0 to examine the independent overall relationships present in this dataset.

Figure 1. Illustration of the first function in Canonical Correlation Analysis
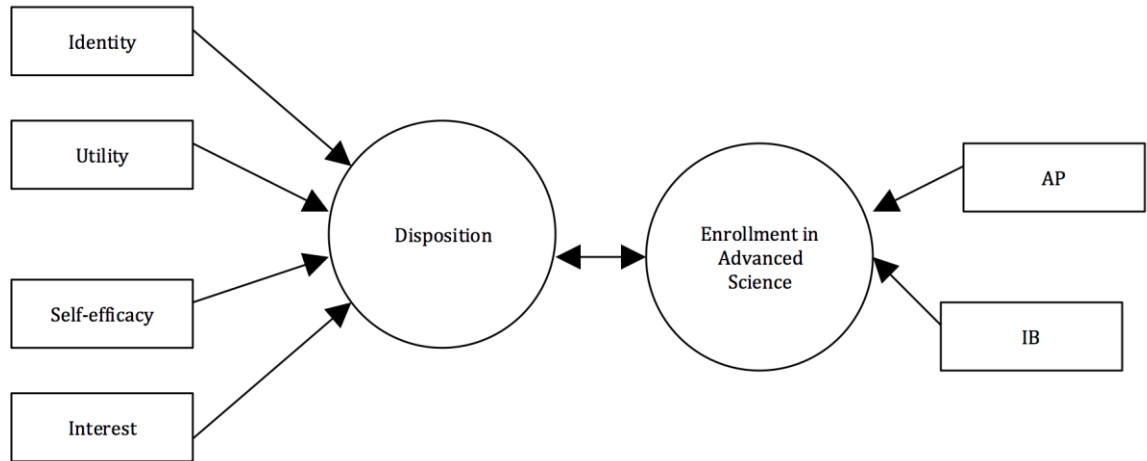
Results

Descriptive statistics for each of the science disposition scales and advanced science course enrollment items are presented in Table 1. Scores were largest for utility, followed by self-efficacy, interest, and identity. Students' reported intentions suggest that approximately 22% and 8% of Black girls planned to enroll in AP or IB science, respectively.

Table 1: Descriptive Statistics for Predictor and Criterion Variables

	M(SD)
Science Identity	-.109 (.991)
Science Utility	.133(.933)
Science Self-efficacy	.027(.812)
Science Interest	-.045(.886)

Table 2 presents the correlation matrix between all variables. All variables were statistically significantly correlated. As presented in Table 2, observed correlations range from .15 to .48. Science identity had the largest correlation with enrollment in both AP and IB science, although the relationship between identity and IB enrollment was weaker.

Table 2: Correlation Matrix

	Identity	Utility	Self-efficacy	Interest
Utility	0.243			
Self-efficacy	0.385	0.384		
Interest	0.326	0.349	0.476	
AP	0.327	0.173	0.246	0.276
IB	0.164	0.136	0.160	0.149

All constructs were statistically significantly correlated at $p < .05$.

A CCA was conducted using four disposition variables as predictors of two measures of high

school enrollment in advanced science courses to evaluate the multivariate shared relationship between the two sets of variables. The analysis yielded two functions with canonical correlations of .389 and .060 for each function. Collectively, the full model across all functions was statistically significant using the Wilks's λ = .849 criterion, $F(1,802)$ = 23.85, p < .001. As observed in Table 3, the predictor that has the greatest weight in the CCA is science identity followed by science interest. Coefficients with the same sign indicate a positive relationship, while an opposite sign represents an inverse relationship. All of the predictors were positively related to the outcome variables in the model.

Table 3: Canonical correlation among disposition and high school achievement variable sets

		Weights	Canonical Correlation
Disposition Variables	Identity	-0.627	0.389*
	Utility	-0.114	
	Self-efficacy	-0.186	
	Interest	-0.394	
Enrollment Variables	AP	-.917	
	IB	-.175	

* indicates a statistically significant correlation at p <.05

Discussion

The canonical correlation between science dispositions and participation in advanced science must be interpreted in context. Contextually, this is a relationship between a student's attitude and a behavior. According to Bosco, Aguinis, Singh, Field, and Pierce (2015), an observed correlation of r = .255 (ES = .065 or 6.5% of the variance) represents a large effect size in this context. Thus, the observed relationship between science dispositions and participation in advanced science of r = .389 explains 15.13% of the variance and is substantial when placed in context. Additionally, the data shows that science identity had the highest correlation with AP and IB sciences, and that science identity, followed by science interest and self-efficacy, were positive predictors of enrollment in advanced high school science courses for Black girls. Self-efficacy, interest, and utility were substantially less influential constructs in the canonical correlation. This suggests that the majority of the predictive information for the science disposition construct was observed in science identity. Therefore, the development of science identity in Black girls should be the focus of educators and parents seeking to increase Black girls' participation in advanced science courses.

Limitations

This study presents correlational research results that model the relationship between scientific dispositions and Black female student participation in advanced science courses. One limitation of correlational research is the inability to make causal inferences. Therefore, this study does not indicate that positive science dispositions cause Black girls to enroll in advanced science courses. However, this study does indicate that positive science dispositions predict participation in advanced science courses for Black female students. Therefore, it is important to acknowledge that correlation does not indicate causation, but rather the strength of the predictive relationship between two variables. Also, although this study shows a correlation between advanced science and science disposition for Black girls, it does not directly provide the

narratives from self-reflection of Black girls. More studies need to be conducted to document Black girls' perception of whether they 'feel like a scientist' or see themselves as potential scientists after 'doing science' in the classroom or after passing advanced science courses.

Conclusion

This study is significant because, in order to increase equal opportunities in advanced science participation, it is important to understand how the science dispositions of Black girls predict advanced science course enrollment. This study also presents foundational understandings of the scientific dispositions of Black girls that can inform further critical examination of access, equity, and achievement related to race and gender. Pre-existing studies show the rate of enrollment in most STEM classes is similar with respect to gender, but there is a stark difference when one isolates the data into gender *and* race. This illuminates the fact that studying advanced science course enrollment based on gender alone is not sufficient to diversity the pool of qualified applicants for STEM fields, but other factors such as race must be considered.

It is critical that families and educators begin early to prime the STEM pipeline for Black females, which includes increasing access to gifted programs and AP classes. In elementary school and all grade levels, Black girls need exposure to science, with attention to mentors and role models who share their race and gender (Young, Feille, & Young, 2017; Young, Young, & Paufler, 2017). That is, these students must be exposed to Black females in STEM as one strategy to increase or reinforce their interest, self-efficacy, and identity, along with the utility value of science. In addition to STEM professional exposure, immediate classroom actions should include teachers and counselors serving as advocates for Black girls by consciously amending classroom activities that help increase students' science identity and utility, such as advanced, project-based, hands-on science activities that include active learning in the classrooms. Curriculum should be relevant to Black girls, providing real world and culturally relevant literature and lesson plans (Ford, 2010). In conclusion, the results suggest that examinations of race and gender are critical to priming the diversification of the STEM pipeline.

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Section 2:

Book Reviews

Emdin, C. (2016). *For White folks who teach in the hood... and the rest of y'all too: Reality pedagogy and urban education*. Boston, MA: Beacon Press.

Reviewed by Edmund S. Adjapong, *Teachers College, Columbia University*

Christopher Emdin's *For White Folks Who Teach in the Hood... and the Rest of Y'all Too* provides a breath of fresh air for any urban educator who is looking to improve their practice or gain authentic insight on urban youth. The title and book cover alone grab the attention of anyone who has even the slightest interest in education and relates to all stakeholders in education. Dr. Emdin draws from his personal experiences as an urban student, urban educator, and urban education researcher to offer a new approach to teaching and learning in urban educational spaces.

In a time where researchers have described and discussed the pitfalls of urban education ad nauseam, they often neglect to provide notable policy or pedagogical practices that improve teaching and learning in urban schools. This allows the perpetuation of the same traditional narrative of failing urban schools that perform substantially worse than suburban schools without a remedy. In his book, however, Emdin provides a rich description of urban schools through his multiple lenses as an urban educator and, more importantly, he explores pedagogical practices that he has developed through his research in urban schools.

In his illustration of the context of urban education, he shares that urban educators often find themselves in a position to serve as a "savior" to urban students to improve their circumstance or save them from their communities, which teachers may deem as dangerous, gritty, or not palatable. Emdin argues that when educators feel as if they are in a position to act as a "savior" for urban youth, they miss opportunities to create deep connections with students, which ultimately leads to misunderstanding the realities of their students. Emdin questions and challenges the age-old common tropes that teachers are encouraged to erase themselves to seem invisible to students, not smile until November, and condition students to act "properly." He argues that when educators enact these practices it keeps them emotionally disconnected from students, and they miss opportunities to foster deep connections with students. I agree with Emdin, as urban students do not need educators to be their "saviors," rather urban students need educators who are open to becoming students in the sense that they are open to learning about the culture and realities of urban youth.

Emdin suggests that urban educators consider his approach to teaching and learning, Reality Pedagogy, which "focuses on teaching and learning as it is successfully practiced within communities physically outside of, and oftentimes beyond, the school" (p. 43). Emdin's Reality Pedagogy, which he thoroughly describes through personal anecdotes and practical examples, draws on enactments that occur in the Pentecostal church and Hip-Hop culture. His pedagogical model is composed of practical tools, which are identified as 7Cs (co-generative dialogue, co-teaching, cosmopolitanism, context, content, competition, curation) that educators can use in their classrooms immediately upon reading.

Emdin writes this book for "white teachers who are already in these schools, the preparation of those being recruited to take these teaching positions, and [to] challenge a 'white folks pedagogy' that is enacted by teachers of all ethnic and racial backgrounds" (p. 15). While Emdin does not blame educators for their lack of understanding of the realities of urban youth, he also does not believe that increasing the number of Black educators is the ultimate solution to improving urban schools. Rather, he believes we should focus our attention on working with the

already established teaching workforce to improve their knowledge of urban youth and their connections with their students.

Over the past few decades, educators have noted and discussed the importance of utilizing students' culture as a tool to better reach and engage students, particularly urban students (Emdin, 2011; Ladson-Billings, 1995; Tate, 1995). Using his personal experience and the frameworks of culturally relevant pedagogy and critical pedagogy, Emdin's reality pedagogy bridges the gap between theory and practice as he provides tangible tools that align directly with theories that have been proven to better educate youth while considering and using youth culture.

For White Folks Who Teach in the Hood... and the Rest of Y'all Too, comes at a pivotal time considering the state of urban education. Urban schools continue to fail to educate the students they serve. Emdin's approach to teaching and learning encourages educators to try a different approach and "focuses on privileging the ways that students make sense of the classroom while acknowledging that the teacher often has very different expectations about the classroom" (p. 41).

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Reviewed by Carly Jennings, Texas A&M University

Mark Zuckerberg's idea was simple: the billionaire Facebook founder wanted to directly link enticing amounts of funding to classroom-level reform by purging bad teachers, keeping good ones, hiring better teachers and most importantly: paying vastly improved salaries to those new-and-improved cadres of teachers. *The Prize* is reporter Dale Russakoff's chronicle of the aftermath of 2010's splashy, Oprah-show announcement of Zuckerberg's $100 million pledge of matching funds to Newark Public Schools (NPS). This story is relevant to the historical context of America's so-called urban schooling crisis, and schooling's oft-overlooked constituency of urban parents. *The Prize* is also a cautionary case study of what happens when subject matter experts (and dilettantes for that matter) wrongly presume that their skills for success in one arena will transfer seamlessly to other practice domains. Given the Trump administration's recent installation of education privatization advocate Betsy DeVos – the antithesis of an urban constituent of public schooling – the need for this book's lessons are more dire than ever before.

The amount of money Zuckerberg pledged was the largest gift ever received by an individual school district. With bipartisan facilitation from Republican Governor of New Jersey, Chris Christie, and former Newark Democratic mayor, Cory Booker (along with a squad of other donors who matched the $100 million), Zuckerberg and his wife, second-generation American, Dr. Priscilla Chan (a stellar example of mass schooling's productivity potential) set out to reform Newark's failing school system. This book details the blind spots revealed when Mark Zuckerberg, boy-billionaire, Harvard dropout, Facebook founder, and street-naive philanthropist attempted a stroll through Newark, New Jersey's political machinery: he got his pockets picked by a concentric rings of East Coast politicians, union bosses, and high-priced consultants.

Among other missteps, Zuckerberg failed to understand protectionist New Jersey employment law before committing $100 million to flawed assumptions of how easy it would be to slough off classroom and bureaucratic barnacles. By law in New Jersey, tenured teachers cannot be fired in the course of downsizing or school closings – they must be reassigned elsewhere in the district before new hiring can happen. In other words, "bad" teachers stay on the payrolls, even if they have been kicked out of classrooms. Outsider interests, moneyed though they may have been, had no mechanism for changing state law. Teachers, however, had a guardian empowered to protect the status quo – their electorally influential labor union. The politicians who advised Zuckerberg's venture either did not understand those same laws, or chose not to speak up, chose not to disabuse their patronage piggybank of his noble notions. In the end, the teachers' union secured for their constituents the largest slice of the Zuckerberg, et al. pie – more than $89 million. Nearly half of that amount, $44 million, went to fund salaries that had zero impact on the classrooms of the Newark 2.0 school system. That money did not end up impacting classrooms or direct instruction. Instead, it funded pay raises for principals, and back pay to settle negotiation impasses that had occurred before the billionaires ever considered reaching into their own pockets for the sake of school reform in Newark.

There were also culture clashes that impeded the reform plan in Newark: corporate ways versus bureaucratic means; the pampered privileged talking over the neglected poor; and questions framed in technological paradigms (repair versus reboot for NPS 2.0). Even the meaning that readers might make of the word "prize" as referenced in the book's title was in

contention. In American Civil Rights Movement parlance, "the prize" is a moral victory, social justice, the "one day" of which Martin Luther King dreamed, a thing on which to keep one's eyes. In Newark-speak, "the prize" was control of the school system's $1 billion budget, with its patronage-purchasing power. Noticeably missing from the supposedly boundaryless coalition were voices of local school leaders, local community leaders, and parents.

Unfortunately, Russakoff replicated some of the exclusionary dynamics of the process: in this book, black parents are presented as stereotypical images – angry, loud (as opposed to politically engaged), drugged, and distressed. Proactive, empowered parents were derisively called the "choosers," and were accused of daring to have the luxuries of time, awareness, and system navigation skills. Not until the end do we read about parents who are passionately involved to positive effect. The author detailed competing mental models of the whites in possession of structural power, but revealed very little of the mental operating systems of parents trapped in Newark schools, or of the strategies used by parents whose children were succeeding. Families often navigated tradeoffs in securing educational opportunities for their children. Such tradeoffs were not explored by Russakoff as possibly being conscious choices, so therefore not agented to any will or rationale of the parents making them. Nonetheless, $1,000 a-day consultants from nearby New York City were abundantly present, with voices amplified in meetings and in media.

Although the lessons from this episode in urban schooling (and its reporter-turned-author, Dale Russakoff) have furrowed the brow of many in the East-Coast-based media, whose offerings typically speak to the neoliberal civic, cultural, and financial interests of their educated readership and viewership, these lessons may also embolden explorations into alternative schooling models such as privatization and charterization. Having gained experience and clout through recent reform initiatives in other East Coast cities, there is a workforce of available consultants who have elevated inner-city school reform to a lucrative business model during the years of rapid proliferation of charter-schools-as-school-reform ideology.

This book, which was serialized in the pages of *New Yorker* magazine, reads quickly and efficiently, like an extended newspaper account of the actions, players, and foibles that unfolded over the course of five years in post-industrial Newark. However, because of Russakoff's invalidation of parental agency and community strengths, I do not recommend this book for anyone other than novice urban educators who want to understand a context larger than their immediate experiences. For scholars who already understand surface challenges of big-city schooling, this book offers no insight that would allow me to characterize it as little else besides a waste of time. Spending time with this book would be like spending one's lunch breaks lounging with disgruntled faculty. You would have heard all the complaints before, and probably even lodged some of them yourself.

Morris, M. W. (2016). *Pushout: The criminalization of Black girls in schools*. New York: The New Press.

Reviewed by Kriss Kemp-Graham, Texas A&M University-Commerce

> *"…Don't call me slow. That's why I'm in school, to learn…That triggers it. It does not only make me want to fight them, it makes me want to…it makes me want to ask them, why would they say something like that? The fact that I am the only Black kid in school, it's like, 'Oh are we back in the 1950s now?"* (p. 87)

> *"I always get suspended…[ever since] the first grade…I told my teacher, Don't yell at me, 'but she kept talking….you're yelling at me and I don't like you yelling at me….I told her to shut up..and then she tried to put me in a corner. I am not going into anybody's corner …I ended up in the Principal's office."* (p. 87)

Nationwide, Black girls have the highest suspension rates among all racial and ethnic groups and are the most severely and most disproportionately affected by school discipline policies and practices when compared to other girls (Smith & Harper, 2015). Black girls are suspended out of school at a rate of five times the rate of their White peers (U.S. Department of Education: Office for Civil Rights, 2016). The narratives and experiences of being Black and female, more directly, being "pushed out" of schools because of zero tolerance policies are rarely captured, explored, and reported with the same rigor as Black males in the research literature on school discipline in the US (Blake, Butler, Lewis, & Darensbourg, 2011; George, 2015; M. Morris, 2016; Morris, 2012; Rollock, 2007; Wun, 2015).

Findings from Monique Morris' research spanning four years exploring the experiences of Black girls in public schools and detention centers nationwide, as presented in *Pushout: The Criminalization of Black Girls in Schools,* is seminal in closing the gap in the research literature on Black girls and discipline. *Pushout* is timely, relevant, and a must-read for current and aspiring teachers, school leaders, mothers and fathers, and all others who interact with and care about the positive life trajectories of Black girls. Morris takes the reader on an insightful nationwide journey inside public schools and youth detention centers, interrogating the disciplinary practices and policies that render Black girls vulnerable and their plight invisible to the broader society. The author provides authentic, rich counter narratives of societal characterizations of Black girls as being defiant, unteachable, unladylike, loud, low achieving, and undeserving of respect and access to a quality educational experience. Throughout *Pushout,* the reader is provided numerous examples of the marginalization, degradation, and humiliation experienced in schools by Black girls at the hands of school teachers and school administrators enforcing zero tolerance policies. Through the voices of Danisha, Portia, Paris, Destiny, Shanice, Jazzy, Mia, Shannon and Faith, these resilient Black girls are able to articulate their views of teacher and administrator beliefs, policies, and actions that are demeaning and shameful, and which have marginalized them in their learning and humanity. Thus, the reader is provided with the "other side" of the discipline story. Morris argues, "to counter the criminalization of Black girls, we must first understand what the criminalization looks like and then to building a common language and framework for ensuring that Black girls are not left behind" (p. 9).

Throughout this five chapter exposé, the narratives in *Pushout* are gracefully constructed

and written in a non-academic, unobtrusive storytelling prose. This writing easily allows the reader to internalize descriptions and vicariously experience the varied types of criminalization that Black girls are subjected to due to school discipline policies and the cultural incompetence of teachers and administrators in public schools nationwide.

Morris' book redirects our attention to the disruption in the education of Black girls by school discipline policies rather than focusing on perceived disruptions to the school environment by Black girls as interpreted by teachers and school leaders in their application and enforcement of zero tolerance policies. It is without doubt that the strength of *Pushout* is the strategically placed vignettes, narratives, statistics and empirical research juxtaposed with school policies and societal misperceptions of Black femininity that helps the reader better understand the intersectionality of race and gender and the implications of zero tolerance discipline policies in schools for Black girls. Through the vivid narratives as told by Black girls shared via tears, wounded hearts, souls, and minds, the reader is catapulted front and center to this national crisis.

From the first line of page one of this book, the reader is immediately drawn in and is recast as a voyeur being hurled into the very spaces—classrooms, schools and detention centers where Black girls experience the disparate disciplinary treatment: "Call my mama!" (p. 1). The introduction of *Pushout* sets the tone for subsequent chapters. Morris calls to the readers' remembrance of recent assaults on Black girls by police, school resource officers, teachers, and administrators by succinctly recounting incidents that went viral on social media: *Ashlynn Avery*: book thrown at her by teacher because she fell asleep at her desk; *Kiera Wilmot*: suspended because her science experience went wrong and exploded in school; *Pleajhia Mery*: assaulted by school resource office because she dropped cake in school and refused to pick it up; and six year old *Desre'e Watson*: handcuffed and arrested for her tantrum in kindergarten. These accountings, interspersed with findings from empirical research and national discipline statistics, shed light on the importance of understanding the unique challenges Black girls experience that are much different than their similarly gendered peers, as well as Black boys. Morris provides the reader with a foundation in understanding of what it means to be a Black girl attending public schools in the U.S.

The reader is also introduced to a new framework to understand the implications of the Black girls' experiences with surveillance in schools by zero tolerance policies, school resource officers, and metal detectors that result in their push out. The reader is challenged to critically examine institutional structures, policies, practices, and procedures that push Black girls out of school and to refer to their engagement with discipline as *School to Confinement Pathways* and not the *School to Prison Pipeline*. Practices that push Black girls out of school do not always conclude with their confinement to prison. Morris eloquently argues that these practices often result in delinquency and school dropout and have lifelong generational implications for Black girls, as they result in numerous types of confinement beyond prison: detention centers, house arrest, electronic monitoring, and other social exclusions.

The narratives as told by these girls also inform us that the enforcement of school discipline policies that result in the disproportionate assignment of disciplinary consequences to Black girls are predicated very often on stereotypical societal images of Black girls. Black girls are seen as loud and defiant. Thus their failure to conform to White Middle class female expectations of femininity often results in their involvement with the disciplinary process in their schools because they are misunderstood. As Morris writes: "For Black girls to be 'ghetto' represents a certain resilience to how poverty has shaped racial and gender oppression. To be 'loud' is a demand to be heard. To have an 'attitude' is to reject a doctrine of invisibility and

mistreatment. To be flamboyant or 'fabulous' is to revise the idea that socioeconomic isolation is equated with not having access to materially desirable things. To be a ghetto Black girl, then is to reinvent what it means to be Black, poor and female" (p. 19).

In each chapter in *Pushout*, the reader is immediately summoned into the space, place, and emotional psyche of Black girls in public schools. In Chapter 1, *Struggling to Survive*, Morris provides insight from Black girls of their Grit and Grace to succeed against all odds. We learn how they view themselves as students, how they view their schools, and how they perform in schools despite being classified as unrefined, not smart, overly sexy, promiscuous and loud. Through their words, these extraordinary Black girls provide examples of their Black girl magic in play and share stories that demonstrate their resilience against dominant assumptions about their intellect, femininity, sexuality, and attitudes that project them as aberrant and menaces in schools.

In Chapter 2, *A Blues for Black Girls When the 'Attitude" is Enuf*, Morris provides descriptive nationwide discipline data and detailed narratives about the implications of zero tolerance school discipline policies and their corresponding impact on the academic trajectories of Black girls. The girls share numerous stories of their disciplinary assignments for standing up for themselves—the reader gains a perspective on the term "willful defiance," its interpretation, and implications for Black girls in public schools.

In Chapter 3, *Jezebel in the Classroom*, the reader is introduced to mitigating factors of sexuality, poverty, sexual exploitation, and foster care that influence Black girls' engagement with school discipline. Through narratives of the girls, the reader gains a heart wrenching education about the connection between Black girls' involvement with the sex trade, the failure of schools to recognize this phenomena, and Black girls' increased representation in disciplinary consequences. Additionally, in this chapter, the girls share stories of sexual victimization and objectification in and out of school that go unchallenged and unaddressed. Finally, this chapter provides detailed descriptions of how the biased enforcement of school dress codes reflect societal biases of Black femininity, resulting in the over-policing and punishing of Black girls.

In Chapter 4 *Learning on Lockdown*, Morris takes the reader inside youth correctional facilities. This chapter provides first person perspectives of Black girls who are confined to detention centers. Their narratives provide insight into their beliefs of the effectiveness of detention centers in rehabilitating them to become productive citizens. The girls share stories of practices within these facilities that impact their academic and mental states of mind.

In Chapter 5, *Repairing Relationships, Rebuilding Connections,* the author provides us with hope and recommendations for how Black girls can be supported in schools, emphasizing the importance of relationship building. Additionally, Appendix B: *Alternatives to Punishment* highlights programs that are currently being piloted to combat the criminalization of Black girls in schools.

Kudos to Monique Morris on providing this counter narrative on Black girls and school discipline. Schools are one of the largest influences on the life trajectory of Black girls and, the robust work presented in *Pushout* demands that the way in which we view Black girls and their experiences in schools must be shifted. After reading *Pushout*, one feels compelled to spring into action: to engage in courageous conversations to bring a public consciousness to this national crisis; to create and collaborate with key stakeholders on multiple ways to interrupt the *school to confinement pathways;* and to scream loudly from the rooftops that BLACK GIRLS MATTER!

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Valenzuela, A. (Ed.) (2016) *Growing critically conscious teachers: A social-justice curriculum for educators of Latino/a youth*. New York, NY: Teacher College Press.

Reviewed by Gang Zhu, Texas A&M University

As a nationally acclaimed scholar on subtractive schooling (Valenzuela, 2002, 2010) and theories of critical care in urban schools, Valenzuela insightfully moves forward the research on urban education in her edited volume. By drawing upon years of research on Latino/a communities based on National Latino/a Education Research and Policy Project (NLERAP), Valenzuela and her contributors adroitly address the imperativeness of cultivating critically-conscious, community-anchored, authentically-caring, and social justice-oriented teachers for successive generations of students. Overall, the book systematically incorporates an assortment of classical and cutting-edge research on critical consciousness and participatory action research. Moreover, the book aims to bridge the gap between theory and practice, offering case studies as frames of reference, which makes it a useful guide for practitioners.

Valenzuela and her colleagues' research shows us that education is inherently political. Numerous Latino/a communities are still oppressed and have been marginalized for a long time. Also, their cultures are devalued and dehumanized by the dominant and oppressing groups in society. The school-to-prison pipeline for Latino/a students persists. Thus, urban school teachers, especially teachers of color who represent the traditionally underserved communities, should not be color blind. Instead, these teachers should cultivate critical consciousness.

At the beginning of the book, Valenzuela and her contributors, cognizant of the interconnectedness and empowerment of Latino/a educators, adopt *EL ARBOL* (trees, or "family trees") as the guiding metaphor to illustrate NLERAP's national Grow Your Own Latino/a Teacher (GYO-TEI) Initiative. The first reason is that Valenzuela and her contributors are seeking an emancipatory approach to transforming not only the students, but also communities, teachers, and readers. Second, the metaphor draws attention to the core strengths of NLERAP that are deeply rooted in our sense of who we are as a collective of educators. The metaphor reminds educators to validate and honor minoritized students' community cultural wealth (Yosso, 2005, 2007) and funds of knowledge (González, Moll & Amanti, 2005). Through interweaving signature courses and participatory action research, the aim of NLERAP's GYO-TEI's initiative is to move people of color from the margins to the center—philosophically, morally, intellectually, and politically (Valenzuela, 2016, p. 19).

In Chapter 2, Mercado mainly addressed teacher capacities for educating Latino and Latina youth. After realizing the traditional "neutral" framework in teacher education, which leaves the race and power of teachers unexamined, Mercado endeavored to answer this question: What individual and collective capacities (i.e., professional knowledge, skills, and dispositions) do new teachers need to promote equitable access to knowledge, resources, and opportunities for Latino/as attending under-resourced schools,? In terms of knowledge, Mercado posited that teachers should take contextual influences, social and emotional factors, and primacy of student learning into account. With regard to skills, Mercado emphasized a broader pedagogical perspective that embraces wholeness—the unity of mind, body and spirit, dialogue and coexistence. With regard to dispositions, Mercado stressed that teachers should more be driven by intrinsic motivations that committed to educational and economic inequalities that limit Latino students' opportunities for self-actualization.

In Chapter 3, Arellano et al. found that there are more and more culturally and linguistically diverse students in American public schools. However, the majority of inservice

and preservice teachers are still White, female and middle-class. This typically results in a cultural mismatch between teachers and students. As historically disenfranchised populations increase, preservice teachers in particular, should learn to teach from a social-justice paradigm. This means that preservice teachers should continually check their belief systems, critically examine their assumptions, and avoid replicating the unfair and inequitable conditions that shape the status quo educational policies and practices. In other words, preservice teachers should transition from espousing deficit views on minoritized students to asset-based views. For instance, preservice teachers should abandon the stereotype that Latino/a and African American students' parents do not care about education, and that their children should assimilate into the mainstream society by abandoning their language and cultural identities. What Arellano et al. advocate is timely and to the point. The chapter contributors insightfully found the Achilles' heel embedded in teacher education: the colorblindness of preservice teachers. This chapter renders the audiences, especially teacher educators, to better reflect our teacher educations programs.

 Chapters 5 and 6 both focus on participatory action research (PAR). The chapter contributors adopted *PAR Entremundos* (or PAR "among worlds"), a theoretical construct developed by scholars in this field. *PAR Entremundos* provided a critically-conscious lens for practitioners to establish democratic, equitable relationships among participants. Furthermore, *PAR Entremundos* draws upon Freire's praxis theory, critical race theory, feminist theorizing, and indigenous cosmologies. Later, the authors listed an array of guiding principles that undergirding PAR such as critical inquiry, knowledge co-construction, and transformational action. The authors also offered several guiding questions and practices to enrich the understanding of PAR. This practical approach facilitated readers to better implement PAR in their educational contexts.

In addition, Chapter 6 presents a case example of PAR in a high school classroom with a focus on social justice education project (SJEP). The students engaging in the projects are empowered to choose and investigate problems and issues that affect them personally. After identifying the issues, the students are encouraged to problematize the themes by collecting data through participant observation and writing up of field notes. Then the students initiate analysis that aims to identify the relevant patterns in the data. At the end of the year, the students showcase their research at a parent and student meeting organized by the SJEP. This Freirean learning method enabled the students to "read the words" and "read the world" at the same time. Thus, it is authentic and transformative.

In the concluding chapter, Valenzuela returned to the *EL ARBOL/ The Tree* metaphor. For the author, *EL ARBOL* "invokes a generational consciousness—or ancestral form of accountability—that is encrypted, available for decoding, so that we might acquire a sense of meaning, purpose, and direction in our pursuit of freedom for all of humanity in a world that seems to be spinning out of control (p. 106). Situated in a society characterized by individualism, consumerism, and materialism, *EL ARBOL/ The Tree* metaphor made us to achieve full awareness of humanity among various ethnical and cultural groups. In this sense, *EL ARBOL/ The Tree* metaphor sheds light on our journey toward social and educational transformation.

Overall, in light of the steady increase of Latino/a English learners, Valenzuela and her contributors, developed a critical framework for cultivating culturally competent teacher for this nation. They also identified the necessary knowledge, skills, and dispositions required for the teacher education programs. The overarching goal of this approach is not merely to bridge the persistent achievement gap but to humanize the whole society. Admittedly, this approach is ambitious and proactive. However, when the authors illustrated the GYO-TEI initiative, they

said that this kind of teacher education is critical and transformative compared to traditional approaches. However, there were some shortcomings. First, they did not adequately illustrate the fundamental differences between their approach and more traditional approaches. Second, when the authors showed the implementation of GYO-TEI initiative, they emphasized participatory action research. Although participatory action research is an effective way to initiate GYO-TEI initiative, community-based learning, social-service learning and other approaches also might be feasible. Concisely, the authors failed to acknowledge the need for multiple strategies in implementing the GYO-TEI initiative. As each school and classroom has different concerns and resources, it should be anticipated that each school and classroom will adopt different ways to implement GYO-TEI initiatives.

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Reviewed by Jacquelyn Chappel, University of Hawaii at Manoa

Written as a letter in response to his fourteen-year old son's reaction to the Michael Brown verdict, Ta-Nehisi Coates' *Between the World and Me* investigates the pain, hypocrisy, and futility surrounding the reality that black male bodies are under attack in America. At the heart of the story is the troubling killing of Coates' college acquaintance who was gunned down by a police officer from Prince Georges' County, an upper-class, suburban black community with a precinct notorious for its aggressive, racially-motivating tactics.

While the book grapples with the injustice and contradictions inherent in much of the discussion on racial profiling, the book does not---nor does it claim to---answer any questions, a fact which has frustrated some readers, including author of *The New Jim Crow,* Michelle Alexander, who reviewed *Between the World and Me* for *The New York Times*. How did slavery transmogrify into racial profiling? What is the logical path from chattel slavery to the unnecessary deaths of Michael Brown and Eric Garner? Why do black police officers gun-down their own? Coates does not answer these and other questions raised in the book.

Instead, Coates offers a critique of the American educational system, based on his experience in Baltimore's public schools. The school system, he observes, was more interested in compliance than curiosity and inculcated a spirit of distrust. He draws a comparison between schools and the criminal justice system, both made "to discipline the body" (p. 26). Feeding students sanitized versions of history, which encouraged MLK-like pacifism, schools were like "curtains drawn between me and the world" (p. 28), he writes, concealing truths rather than revealing them. At one point, easily missed, he goes so far as to suggest "perhaps they [schools] should be burned away" (p. 27).

His first real lesson in critical thinking came from his grandmother who punished him with writing prompts designed to interrogate his personal motivations for acting out in school, "Why did I feel the need to talk at the same time as my teacher? Why did I not believe my teacher was entitled to respect" (p. 29)? Through these writing assignments, Coates began to think deeply and learn about himself. Through these writing lessons, Coates, now a well-established writer for *The Atlantic,* says he learned to write.

Published three years after the death of Trayvon Martin, just as the national conversation on police brutality and racial profiling was beginning to grow tiresome to some, *Between the World and Me* has reinvigorated the discussion. The book offers educators a recommended read for their students and colleagues, and the book would fit high school classrooms alongside *Racial Profiling*, a series published by Greenhaven Press that includes easy-to-read essays with views representing both sides of the aisle. For researchers of urban education, the book offers an authoritative first-hand account of one man's escape from a toxic, inner city environment. Despite this escape the author warns his son, as a young black man, that he is still at risk of being killed.

The book ends poignantly with a visit to the mother of Coates' college acquaintance, a promising young man whose mother had worked hard to raise him with all the middle-class privilege that Coates' own son enjoys. The book reminds us that in the United States today, young black men, regardless of class, can still be wrongfully gunned down in the prime of their life with little hope of justice. It offers fertile ground to help spur discussion on why

controversial practices, including racial profiling and stop and frisk policies, remain legal in many states in the U.S.

Less central to the narrative but important for educators, Coates' reflection on America's school system offers insight into the minds of disgruntled inner city youth, who see school as another form of entrapment, analogous to prison itself. "We could not get out," Coates repeats over and over again in his discussion on education (p. 27-28). Not relevant to his lived experience, focused mainly on discipline, and presented only as an alternative to prison, the American educational system of Coates' inner city, he argues, did not arm him with the realities of the world.

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