The Complexities of Culturally Relevant Pedagogy: A Case Study of Two Secondary Mathematics Teachers and Their ESOL Students

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Culturally relevant pedagogy is not well understood as an instructional strategy in the mathematics classroom. This study reveals the challenges two teachers faced when they implemented a pilot project with ninth and tenth grade ESOL students. The task they envisioned as culturally relevant did not capture their ESOL students' interests; rather, it caused both teachers and students to wrestle with tensions around cultural relevance. The major finding of this study is teachers' beliefs and identities are complicated with CRP. Specifically, it changed two teachers' beliefs about teaching mathematics and their role in the mathematics classroom. It also informed the teacher-researcher about the needs of teachers prior to implementing CRP. Although the task allowed ESOL students to acquire specific knowledge and to develop critical consciousness, it did little to enhance their cultural competence. Understanding the nuances of CRP will help teachers to better operationalize it (Morrison, Robbins, & Rose, 2008).

Culturally relevant teaching has emerged as a pedagogical technique to "draw meaningfully on the cultures, languages, and experiences that students bring to classrooms to increase engagement and academic achievement for students of color" (Dutro, Kazemi, Balf, & Lin, 2008, p. 271). The hallmarks of culturally relevant pedagogy (CRP), which emerged from Ladson-Billings' (1994) observations of expert teachers of African American students in the field, are academic success, cultural competence, and critical consciousness. However, enactment of CRP in the mathematics classroom is complex and may contradict teachers' beliefs and assumptions about the nature of mathematics, how it should be taught, and the teacher's role and identity as these relate to teaching underserved students.

The purpose of this paper is three-fold: (1) to provide salient examples of what CRP is and is not; (2) to help teachers realize the nuances of implementing CRP; and (3) to help teachers understand how their beliefs about culture, schooling, and the nature of mathematics in-

fluences their identity development and practice of CRP. Mathematics is not acultural and should be not divorced from the everyday experiences of students (Leonard, 2008). However, finding appropriate examples of culturally relevant teaching in practice has been described as "capturing lightning in a bottle" (Ladson-Billings, as cited in Gutstein, Lipman, Hernandez, & de los Reyes, 1997, p. 725). Few mathematics teachers know and understand what CRP is and how it might be enacted in the mathematics classroom (Leonard, 2008; Gutstein et al., 1997).

Ladson-Billings (1995a) defines culturally relevant teaching as "a pedagogy of opposition not unlike critical pedagogy but specifically committed to collective, not merely individual, empowerment" (p. 160). Critical pedagogy and critical race theory stem from the work of Paulo Freire (2006) and Derrick Bell (1987), respectively, who examined how power and position in society are influenced by class and race. Schooling in the U.S. and elsewhere is very much a racialized experience. Race is the "inescapable paradigm through which children locate themselves and others" (Dutro et al., 2008). When it comes to teaching mathematics to children of diverse backgrounds, their social realities should not be ignored (Martin, 2007 & 2009). It is important for teachers to understand the complexity of race, culture, and identity when they engage in CRP. For teachers of black[1] children, then, CRP means developing new classroom norms, behaviors, and performance standards. Moreover, the context for learning and achieving in mathematics should reflect black students' identities *as black students* (Martin, 2007).

Getting teachers of black children to reconceptualize how they construct their classroom norms requires them to revaluate their beliefs about these students. Teachers' beliefs and views of themselves and their students relative to their places and positions within society influence their identity as well as their instruction (Gonzalez, 2009). While teachers are encouraged to bring the culture of the community into the classroom to improve achievement, it is difficult to change teacher pedagogy without causing teachers to reflect upon their beliefs and identity. Cases of teachers' attempts to engage in cultural relevance are important to better understand the nuances and consequential entanglements that may result in implementing CRP in the mathematics classroom (Dutro et al., 2008; Gonzalez, 2009). We present a case study of two mathematics teachers and their predominantly black ELL (English Language Learners) high school students to address the paucity of research among this student population and the nature of beliefs and practice when it comes to enacting CRP.

Language is critical to developing understanding among linguistically diverse students in reform-based classrooms, where students are required to explain, offer conjectures, justify, and support their mathematical thinking with sound arguments and evidence (Moschkovich, 2002). Some scholars (Campbell, Adams, & Davis, 2007; Moschkovich, 2002; Solano-Flores & Trumbull, 2003) argue that certain problem contexts may cause language minority students difficulty because of the different cultural lenses these students bring into the mathematics classroom and differences in interpretation of vocabulary. Rather than viewing second languages as deficient, teachers should support learning among bilingual learners by valuing their identities, perspectives, and experiences in the mathematics classroom (Campbell et al., 2007; Moschkovich, 2002). Not only is vocabulary and understanding of vocabulary important, students must be able to construct multiple meanings for words (i.e., develop a mathematics register) (Boaler & Staples, 2008; Campbell et al., 2007; Moschkovich, 2002) so that second language learners must also be able to participate in classroom discourses where bilingualism and code switching are commonplace (Delpit, 1995; Moschkovich, 2002).

Research studies on the experiences of predominantly black ELL (African, Caribbean American, and Black Hispanic) students in

1 This term includes all students who are part of the African Diaspora.

mathematics classrooms are virtually non-existent (Matthews, 2008). Furthermore, examples of teaching for cultural relevance in secondary mathematics classrooms are also sparse (Gonzalez, 2009). We present a case study of two secondary mathematics teachers' ideas and practices with ethnically diverse ESOL students to address the dearth of research in the literature. Case studies that reveal the nuances of enacting culturally relevant pedagogy with diverse ethnic and language minorities will help the educational community to understand "some of the enabling and disabling conditions…and move us toward a more just and equitable society" (Gutstein, 2006, p. 41). This case study examines the complexity of enacting CRP with ethnic and language minorities and extends the literature by examining the link between two mathematics teachers' beliefs, identities, and enactment of CRP with ELL high school students' interpretation of the mathematical task. The research questions that guided this case study were:

1. How do two mathematics teachers' beliefs and identity interact with their pedagogical decisions before and after implementation of CRP?
2. How did culture interact with predominantly black ELL students' understanding, completion, and fidelity of the mathematical tasks?
3. How did the mathematical task adhere to the tenets of CRP (i.e. academic success, cultural competence, and critical consciousness)?

Conceptual Framework

The conceptual framework that supports this study is the theory of culturally relevant pedagogy (CRP). Ladson-Billings' (1995b) work with a cadre of teachers allowed for the development of a grounded theory of CRP. The theory is situated in the context of black feminist thought and based on the following propositions: "(1) concrete experiences as a criterion of meaning, (2) use of dialogue in assessing knowledge claims, (3) the ethic of caring, and (4) the ethic of personal accountability" (Collins, as cited in Ladson-Billings, 1995b, p. 471). CRP is both sociocultural and sociopolitical in nature, prompting teachers to reflect upon their positions as change agents (Dutro et al., 2008; Gonzalez, 2009; Gutstein, 2006; Ladson-Billings, 1995a). As teachers reflect on their own cultural backgrounds, they are more likely to realize the advantages and privileges that race and social economic background afford them (Blanchett, 2006; Ladson-Billings, 2000). Realizing these advantages and privileges, culturally responsive teachers attempt to impart knowledge that students need to successfully navigate the educational system and society at large (Delpit, 1995; Hill, 2006; Ladson-Billings, 1994). The tenets of culturally relevant theory—academic success, cultural competence, and critical consciousness—are described as they are complicated by teacher beliefs and identity, teaching for social justice, and mathematical tasks.

Teacher Beliefs, Identity, and Academic Success

Beliefs are defined as "attitudes, confidence, motivation, self-concept, and self-esteem that are formed and expressed in social settings through communication, actions, and evaluations" (Osisioma & Moscovici, 2008, p. 287). "All teachers hold beliefs, however defined and labeled, about their work, their students, their subject matter, and their roles and responsibilities" (Parajes, 1992, p. 314). Beliefs, attitudes and values combine to form a person's belief system, which can remain intact despite evidence to the contrary and change only when their assumptions are challenged by a gestalt experience (Parajes, 1992). While teachers' beliefs are not always consistent with their pedagogy (Cooney as cited in Hart, 2002), "there is substantial evidence that teachers' beliefs about mathematics impacts their teaching of mathematics" (Hart, 2002). Teachers' beliefs about what counts as knowledge and which activities students will engage in mediate what is learned or not learned in mathematics classrooms (Nasir, Hand, & Taylor, 2008).

Identity "is most often defined as an amalgamation of self-concept, self-understanding, and evaluating oneself in relation to others" (Nasir, 2005, p. 217). This is very apparent in the mathematics classroom. Teachers' views of mathematics as subject matter domain, as

well as who should learn it and how it should be learned, revolve around their own mathematics identity as well as their prior success and failure in learning mathematics. Teachers' identity is critical to their role in the mathematics classroom as their decisions and actions are mitigated by their perception of what counts as content and pedagogy (de Freitas, 2008; Gonzalez, 2009).

Teachers who use only the lens of *achievement* without attending to the *experiences* of poor and minority students are more likely to experience marginal success with these students than teachers who use a well-rounded approach (Leavitt, in progress; Martin, 2007). While there is certainly a need for functional literacy in mathematics, computational skills do not exist within a vacuum (Ladson-Billings, 1995a). Academic success requires teachers to motivate students to learn beyond the basics and develop a set of autonomous skills where curiosity and wonder encourage critical literacy. Critical literacy goes beyond inquiry to encourage students to question, examine, and dispute the power relations that exist in their community and even the world at large (Gutstein, 2006). Learning to teach mathematics from a critical literacy point of view redefines the role of the teacher as well as his/her identity, especially as it relates to academic success (Gutstein, 2006; Ladson-Billings, 1994). In this case study, teacher beliefs and identity are examined before and after implementation of CRP with secondary high school students.

Cultural Competence and the Mathematical Task

Ladson Billings (2000) defines cultural competence as "the ability to function effectively in one's culture of origin" (p. 219). Students' cultural competence can be supported if teachers acknowledge the legitimacy of the students' home language and culture as funds of knowledge (Ladson-Billings, 2000; Morrison et al., 2008). CRP empowers both teachers and students to be self-directed and to take charge of their own learning by using circumstances that arise in the community as forms of official knowledge (Ladson-Billings, 1995b). The mathematical task provides the context for students to engage in cultural forms of knowledge. Thus, an integral part of developing cultural competence in the mathematics classroom is task selection.

However, implementing cognitively demanding mathematical tasks that are also culturally relevant in nature is challenging. Ultimately, the mathematical experiences students have will influence them to "learn or participate or to resist and disengage" (Martin, 2007, p. 16). The mathematical task should motivate students to learn while simultaneously promoting excellence and rigor in order to maximize their mathematical potential (Nasir et al., 2008). Students are more likely to remember mathematics concepts when they are anchored to the culture of the community (Brenner, 1998; Lipka, Hogan, Webster, Yanez, Adams, Clark, & Lacy, 2005; Nasir, 2005). In order to judge the fidelity of mathematical tasks, Stylianides and Stylianides (2008) developed a four-tiered framework: (1) product (goal or end result of a mathematical task); (2) resources (materials used to complete the task); (3) operations (actions used to generate the product); and (4) accountability (incentives to complete the task). This framework was used to evaluate the tasks two mathematics teachers employed when they implemented CRP with predominantly black ELL high school students.

Critical Consciousness and Teaching for Social Justice

Critical consciousness is the ability to understand the political nature of a situation, critique the status quo, and proactively try to change it (Ladson-Billings, 1995b). In order for teachers to engage in activities that will lead to social change, they must understand their role as political beings (Ladson-Billings, 1998). CRP "is about questioning the structural inequality, the racism, and the injustice that exist in society" (Ladson-Billings, 1994, p. 128). de Freitas (2008) contends "addressing social justice issues should be a primary goal of all education – including mathematics education" (p. 43). Connecting mathematics content to social justice and liberation themes allows students to develop critical consciousness.

Teaching for social justice, liberation, and empowerment is a way to motivate students of diverse backgrounds to learn mathematics. Teaching for social justice empowers students who have been marginalized to use mathematics as a form of liberation (Gutstein, 2006). Negative media, normalized failure of people of color, and the criminalization of black males in American society are areas that should be explored and deconstructed (Haberman, 1991; Hill, 2006). As students learn how to use reasoning and logic to make arguments, they become producers of knowledge rather than merely consumers of knowledge. Examples of lessons that develop critical consciousness include addressing the number of liquor stores in urban communities (Tate, 1995); developing land use proposals for abandoned property (Ladson-Billings, 1995b); and addressing cuts in school music and art programs (Leonard, 2009). Thus, teaching for social justice empowers students to change their circumstances or make a difference in their community (Leonard, 2009; Gutstein, 2006; Ladson-Billings, 1994). Teachers in this case study were encouraged to develop a culturally relevant pilot project that would also address a larger social or political issue.

The Research Context

As part of a larger research project that examined the use of cultural pedagogy to teach mathematics in k-8 classrooms (Leonard, 2008), I (the teacher-researcher) developed and implemented a professional development course with eight high school teachers who taught mathematics or science in suburban Maryland. My background in teaching middle school mathematics and science and my experience as a mathematics educator and researcher prepared me teach and interpret the data obtained from this case study. The purpose of the professional development course was to assist current mathematics and science teachers with their instruction in "majority minority" classrooms. The goals of the course were threefold: (1) to help teachers understand and become more sensitive to the culture of students in the classroom; (2) to help teachers learn appropriate ways to infuse student culture into the mathematics and science curriculum; and (3) to reflect upon the needs of novice teachers as they engaged in CRP.

In order to accomplish these goals, the high school teachers and I formed a community of practice (Wenger, 1998). Communities of practice not only share but co-create knowledge (Choi, as cited in Gonzalez, 2009). Our community of practice developed over a period of 20 weeks as we met on Friday afternoons from 3-6 p.m. throughout the 2007-2008 academic year. During this time, we engaged with each other in knowledge production about what culturally relevant pedagogy in high school mathematics classrooms might look like. The course consisted of two parts: (1) examining critical race theory, culturally relevant theory, and teaching for social justice; and (2) implementing culturally relevant pilot projects in the mathematics and science classroom. Readings included the following texts: *Changing the Faces of Mathematics: Perspectives on African Americans* (Strutchens, Johnson, & Tate, 2000); *Rethinking Mathematics: Teaching Social Justice by the Numbers* (Gutstein & Peterson, 2005); *Savage Inequalities* (Kozol, 1991); *The Dreamkeepers* (Ladson-Billings, 1994); *Culturally Specific Pedagogy in the Mathematics Classroom* (Leonard, 2008); *Creating Culturally Responsive Classrooms* (Shade, Kelly, & Oberg, 1997).

During the first part of the course, the teacher participants engaged in discussions and reflections about critical race theory and culturally responsive pedagogy. Discussions revealed teachers' sensitivity to students and their desire for more knowledge about how to support student learning in mathematics and science classrooms. During the second part of the course, the teacher participants brainstormed about culturally relevant topics that could be implemented in their classrooms. Some teachers believed that piloting their culturally relevant project in informal settings where there were fewer students to work with would allow them to field test their ideas prior to implementation in the regular classroom. After reviewing the district's core learning goals, the teachers decided to have students examine various forms of data and to have them use the lan-

guage and instruments of science to collect, organize, interpret, calculate, and communicate information on culturally specific topics. In one case, students were able to self-select their topics for investigation and in other cases the teachers selected topics they believed were culturally relevant for the students they taught.

As the teacher-researcher, I provided teachers with multimedia and Web sites to obtain background knowledge on specific topics they believed were culturally relevant. They watched videos of expert teachers like Kay Toliver and Jaime Escalante to learn how to make connections to content and culture in mathematics and science classrooms. However, the teachers developed their culturally relevant pilot projects on their own. I chose not to intervene in order to find out what the teachers had learned in the course and what they could do on their own. I did serve as a resource when they had questions and provided a few incentives (gift cards & TI-84 calculators) to encourage student participation, especially in after-school clubs.

Setting and Participants

Langston High School (pseudonym) is a comprehensive high school located in suburban Maryland. According to the district website (purposely not cited for anonymity), 1224 students were enrolled at Langston during the 2007-2008 academic school year but only 55.1% of the classes at Langston were taught by highly qualified teachers.[2] The racial demographics of students, as shown in Table 1, reveal the majority of students enrolled at the high school were black (87%).[3] In 2007, Langston met its annual yearly progress (AYP) goals, and proficiency in algebra on the state's exam continued to increase.[4] However, mathematics SAT scores for students in the district declined from a mean of 408 in 2006 to a mean of 403[5] in 2007. Over the past five years, the graduation rate at Langston declined from 98.7% in 2003 to 73.7% in 2007.

Table 1: Racial and Language Demographics of Students at Langston High School*

Race	Percentage
Black, Non-Hispanic	87%
American Indian/ Native Alaskan	<1%
Asian/Pacific Islander	2%
White, Non-Hispanic	2%
Hispanic	8%

*Data obtained from greatschools (2008).

The teacher participants in this study represent a convenience sample, which consists of a cohort of mathematics and science teachers and their students. As shown in Table 2, six of the eight teacher participants were first generation immigrants. Four were black, two were Asian, and two were white. Two teachers were born in the U.S.—one was European American and the other was African American. All of the teachers participated in the professional development course on CRP. The teachers received the aforementioned textbooks, stipend, and college credit for their participation. After developing a pilot project, four teacher participants (one science and three math teachers) implemented CRP with students while teaching in after-school clubs. Three others (two science and one math teacher) implemented CRP into lessons dealing with data and statistics in regular classrooms during the traditional school day. One mathematics teacher was unable to complete the second course and took a leave of absence from teaching because of poor health. Data were collected in four classrooms: two science and two math (three in-school and one after-school). Since this paper is largely about mathematics education, this case study focuses on two mathematics teachers from this cohort and the student participants enrolled in their after-school club. It is this pilot project in the after-school program that provides the most compelling story of CRP, which we share as a cautionary tale.

2 A highly qualified teacher (defined by U.S. Department of Education) is fully certified, has a Bachelor's degree and has completed a content area major or has passed a content area test in the subject he/she is assigned to teach.

3 Because of broad racial classifications, we are not able to disaggregate data to determine percentages of various ethnic black subgroups (e.g. African or Caribbean students and students of both black and Hispanic origin).

4 2006: 30.8% proficient; 2007: 31.7% proficient; 2008: 50% proficient.

5 SAT scores not yet available for 2008.

Table 2: Teacher Participants at Langston (Demographic Data and Subjects Taught)

Gender	Race (Country of Origin)	Content Taught
Male	African American (US)	Science
Male	African (Cameroon)	Mathematics
Female	African (Nigeria)	Mathematics
Male	Caribbean (Barbados)	Mathematics/Science
Female	Filipino (Philippines)	Science
Female	Filipino (Philippines)	Science
Female	White (Argentina)	Mathematics
Female	White (US)	Mathematics

Two mathematics teachers and 12 ninth- and tenth-grade students were observed periodically during the month of January 2008 as they participated in the GEAR UP program. Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) is a federally-funded program that is designed to prepare middle and high school students for college. GEAR UP activities may focus on academic preparation or professional development for educators as well as information sessions for students and parents about college access. Mrs. C (main teacher) and Mrs. K (teacher assistant/graduate student) were the instructors of the GEAR UP class at Langston High School. Mrs. C, an immigrant from Nigeria, had five years of experience teaching secondary mathematics. Mrs. K, an immigrant from Argentina, was a doctoral student in mathematics education at a nearby university. She helped to facilitate instruction in the GEAR UP class two days per week. However, the students who participated in GEAR UP were a subgroup of the school population, which was predominantly African American. The nationalities of nine males and three females in the GEAR UP class were as follows: Bangladesh (1), Congo (1), Cote D'Ivorie (1), Ghana (1), Guinea (1), Jordan (1), Nigeria (4), Togo (1) and Trinidad (1). All of these students were bilingual. Many of the African students also spoke French in addition to their African dialect. These ELL students voluntarily participated and thus self-selected this after-school course.

Methodology

The ethnographic method was used to collect and analyze data for this research project. Particularly, our methodology is aligned with Goodall's (2000) notion of new ethnography, which deals more directly with the interpersonal aspect:

> …writing based on interpersonal relationships gains authenticity from the quality of the personal experiences, the richness and depth of individual voices, and a balance between engagements with others and self-reflexive considerations of those engagements. (p. 14)

In light of this work, we used autoethnography to engage in reflexivity and interpret our respective roles as instructors (Goodall, 2000). As teachers attempted to engage students in CRP for the first time, student voices provided critical feedback. Analysis at the student level helped to authenticate whether or not the task was culturally relevant. Analysis at the teacher level allowed them to reflect and learn from their pedagogy. Likewise, teachers' voices provided crucial feedback for me as the teacher-researcher. Analysis at the teacher-researcher level allowed me to reflect upon my instruction in the professional development course and how it may have enhanced or impeded teachers' enactment of CRP. These analyses are post-critical as they point back to what could have been done in the GEAR UP and professional development courses, respectively, and look forward toward improving future courses for both students and teachers. This three-tiered process allowed us to describe the complexities of culturally relevant teaching in high school from the perspectives of students, teachers, and teacher-researcher.

In addition to student and teacher artifacts, data sources included observations and fieldnotes of five of the eight teacher participants'

instruction in the spring of 2008. As members of a community of practice, data sources also included teachers' course reflection papers and log entries related to their CRP projects. These artifacts provided data sources about teacher beliefs and identities before and after implementing the project with students. The data were analyzed to find specific themes related to beliefs and attitudes about teaching mathematics and CRP. Other data sources included lesson plans, transcripts, and student artifacts, including web-based and paper sources. Only data related to the GEAR UP program are shared in this paper.

The Constant Comparative Method (Strauss & Corbin, 1990) was used to analyze both teachers' written reflections and students' artifacts in the GEAR UP program. This method was used to find, code, and analyze belief statements in teachers' narratives to determine how their beliefs interacted with their implementation of CRP. Teacher narratives were also examined to learn how their identity was influenced by the course and the pilot project. The Constant Comparative method was additionally used to find, code, and analyze student data related to the mathematical task: (1) authenticity of the task as culturally relevant; (2) student interpretation of the task; (3) cognitive demand; and (4) student learning. Data were read several times and then analyzed for key words, patterns, and themes.

Procedure

The GEAR UP Project

Mrs. C and Mrs. K designed a project to implement with students based on the fast food industry. Intrigued by the documentary *Super Size Me* (Spurlock, 2004), the teachers decided to investigate the filmmaker's allegation that eating at McDonald's and other fast food restaurants contributed to the nation's high obesity rate. To test his theory, Spurlock ate excessive amounts of food purchased at McDonald's for 30 days. As a result, he gained 24.5 pounds (a 13% increase in body mass), which caused his body mass index to rise from a healthy range of 23 to an obese range of 27 (Wikipedia, 2008). Thus, the project had the potential to address social issues if fast food chains unfairly targeted consumers, particularly those in poor and minority communities.

Mrs. C and Mrs. K called their project "Downsize Me." Initially, they believed looking at the calories people ingested at fast food restaurants was a culturally relevant task for high school students because teenagers generally eat a lot of fast food and because of its potential to explore a social justice issue. The teachers identified mathematical goals: "Students will analyze data using measures of central tendency and measures of variability in order to make informed decisions", and non-mathematical goals: "Students will discuss eating habits," and "Students will discuss what they can do to make healthier choices when eating at a fast food restaurant." Mrs. C and Mrs. K posed the following questions to help students with the investigation:

> Could Morgan Spurlock have eaten healthier at McDonald's? Was the restaurant chain to blame or did he deliberately choose the menu items that caused him to get the results he did? His nutritionist said his average calorie intake should be 2,500 calories per day. Can you find menu items that Spurlock could have eaten for 30 days without going over this daily average?

GEAR UP students worked together in small groups to record data two days per week for a total of four days over a two-week period. Students used the McDonald's fact sheet found on the Internet to determine the number of calories for each meal. The data from six pairs of students were then pooled together to obtain 30 days worth of data. Then the data and students' reflections were posted on a Wikispace web page. Mrs. C set up the Wikispace page for students to record their data and notes as a means of securing it electronically because the students were reluctant to write things down. The electronic format proved useful when it came to analyzing student data. Finally, students used graphing calculators (TI-83 plus) to compare and interpret the data collected for breakfast, lunch, and dinner.

Results

The purpose of the project was not to shape students' beliefs about fast food, and it cer-

tainly was not to single out the McDonald's franchise. It was to allow students an opportunity to engage in authentic and meaningful mathematics around social and cultural issues the teachers believed were relevant to their lives. Analysis at the student level allowed me to examine the nexus of students' cultural knowledge and mathematical knowledge. Analysis at the teacher level allowed me to examine important themes that emerged from teacher artifacts to learn how their beliefs and identities compared before and after implementation of CRP. Finally, analysis of the mathematical task allowed me to evaluate the task for cultural relevance (Ladson-Billings, 1995b), cognitive demand (Henningsen & Stein, 1997), and task fidelity (Stylianides & Stylianides, 2008). Whenever possible, data were triangulated to answer the research questions posed in this case study.

Analyses of Teacher Belief Statements before Task Implementation

Analyses of belief statements are important when it comes to understanding teacher decisions and pedagogical behavior. Teacher reflections in the form of formal written assignments and informal discussion boards were read and re-read to analyze teacher belief statements about teaching mathematics and reform-based pedagogy. Member checks were conducted to ensure the narratives were interpreted accurately. After review of five documents, two documents were selected for further analysis. Excerpts from these documents, one written by Mrs. K and Mrs. C before implementing CRP, respectively, were analyzed for key words, themes and patterns.

The following key words, in order of prevalence, emerged from the two excerpts: test or assessment (5); policy or policies (4); constructivist (4); and reform (3). Next we analyzed teacher reflections for belief statements using these words. Three themes emerged from the belief statements made prior to implementation of the *Downsize Me* project: (1) school policy; (2) high-stakes tests; and (3) reform-based learning theories. Both Mrs. C's and Mrs. K's belief statements about school policy reveal the powerful influence of the school administrator and the school environment on their instructional practice. Their interpretation of school policy, real or imagined, constrained their behaviors and instructional decision-making:

> *Listening to music during the lesson or while students have individual assignments is against our school policy.... Many students have told me that they work better with music on, but I cannot allow them to break school policy because it will seem OK to do so in other situations.* (Mrs. C)

Mrs. C's belief statements reveal the dilemma she faced if she tried to provide students with a different type of learning environment by playing music. On one hand, students would be able to work at the pace of the music, which has been noted as a cultural trait among some African Americans in the South (Leonard & Brooks, under review). On the other hand, music was simply not allowed. Although it may have improved student outcomes, Mrs. C was hesitant to take the risk. Mrs. K's belief statement, however, implies that she understood the risk. She described how reform-based teaching changed the dynamics of the teacher-student relationship. While she acknowledges that this relationship required mutual respect and mutual trust, she interpreted it to be outside of school policy as well:

> *To get students to buy into a very different relationship with the teacher, the content, and their peers is usually not easy, especially if it's not school policy.... (Mrs. K)*

Another theme that emerged from these teachers' belief statements was their concern about high-stakes tests. Their reflections reveal how the school's emphasis on achievement loomed over the teachers and impacted the school's learning environment:

> *Some of the suggestions were not practical in our day-to-day classrooms, especially with different school policies and strict curriculum guides like the state assessment that classes have to follow.* (Mrs. C)

> *In urban districts, like this one, that are not doing well on the standardized tests,*

> *the pressure put on the teachers to raise the passing rate is huge. From my experience, which is just observing but not teaching, my sense is that the only thing that matters is that teachers get the students ready to succeed on the test.* (Mrs. K)

Teacher attention to high-stakes testing is both necessary and culturally responsive, particularly when it comes to the mathematics education of underserved students (Rousseau & Powell, 2005). Recall that student performance on the district's algebra assessment increased slightly from 30.8% in 2006 to 50% in 2008. Thus, these underachieving students did experience greater academic success in mathematics. However, CRP has the potential to raise achievement even more since students need to use more rather than less rigorous mathematics to be critical (Gutstein, 2006; Leonard, 2008; Martin, 2000). Mrs. K acknowledged:

> *It probably raises more questions than solves problems at the beginning, especially in terms of preparing students for high-stakes tests, but I am convinced it is worth trying.*

Yet, after some exposure to CRP, both of these teachers were ambivalent about the merits of reform-based learning theories.

> *There is a great drive for constructivist teaching everywhere now, but I wonder how constructivist a math lesson can be. It can only be constructivist to a certain point because there are many approaches to solving a problem, but there is a right and wrong answer and that to me is not fully constructivist.* (Mrs. C)

> *I do not think I would be able to drill the students in computational skills and focus on passing the test as my first goal. I am not sure I would be successful in having my students develop critical thinking and meaningful understanding of mathematics either.* (Mrs. K)

Both Mrs. C's and Mrs. K's belief statements suggest they were reluctant to use reform-based approaches (e.g. constructivist, inquiry-based, culturally relevant teaching, etc.) to teach mathematics. While Mrs. C acknowledged there were multiple approaches to solving a mathematics problem (i.e. make a list, write an equation, work backwards, etc.), she believed the answer to a problem was simply right or wrong. This belief statement suggests Mrs. C identified with the traditional view of mathematics; that is, it consists of immutable truths. She was correct in stating that this is *not* the constructivist view. Mathematics is a human endeavor and does not exist outside of human purposes (Lakoff & Núñez, 2000). Whether an answer is *right* or *wrong* is irrelevant. The relevance of the answer depends on the purpose for which the mathematics is used. Tate's (1995) example of the bus pass problem is a case in point. Whether one chooses to get a daily or weekly pass depends upon one's needs. Urban children confounded test evaluators when they chose to purchase the weekly pass even though it was more expensive than the daily pass because they could use it more than once and share it with friends and family members.

Mathematics problems that focus on a single answer instead of a range of possibilities do not always make sense (Cooper & Harries, 2003). If teachers only provide students with problems that converge to a single answer, they may not learn how to explore alternative solutions as appropriate or learn to think outside of the box (Leonard, 2008; Cooper & Harries, 2003). Context matters (Leavitt, in progress). Ignoring the importance of context with word problems may unfairly disadvantage students, especially students from poor and minority backgrounds, as tests that measure annual yearly progress (AYP) often have negative consequences for these students. While preparing students to pass minimal skills tests develops functional literacy, it does little to promote critical literacy.

Mrs. K believed her main objective was not only to teach students specific mathematics skills, but she was also unsure about how to teach critical literacy. Mrs. K understood that reform-based teaching was a long-term commitment and teachers might not see immediate results. Thus, she identified more closely with the constructivist paradigm than Mrs. C

at the outset. Her belief statements suggest that research is uneven when it comes to dispelling the myths, advantages, and disadvantages of traditional versus reform-based teaching. These teachers' beliefs about the nature of mathematics would no doubt influence the types of mathematical tasks they posed for students to do.

After contemplating these comments, I reflected upon my instruction in the professional development course and the texts I selected for teachers to read. Clearly, these teachers did not fully understand the benefits of reform-based teaching in the mathematics classroom. They needed to hear the voices of teachers in the field who struggled with some of the same issues they were dealing with. Equally important were the voices of students who experienced both traditional and reform-based mathematics instruction and whether they believed they were better or less prepared for success in higher education or the work place. Two powerful texts with student voices are *Mathematics Success and Failure among African-American Youth* (Martin, 2000) and *Reading and Writing the World with Mathematics* (Gutstein, 2006). If given the opportunity to teach the course again, I would include these texts to help teachers more fully grasp the challenges and benefits of reform-based pedagogy in the mathematics classroom.

Student Interaction with Culture and the Mathematical Task

In order to learn how culture and mathematics interacted in the learning context, we examined student reflections. Students' reflections were in response to the queries and/or task(s) posed by Mrs. C and Mrs. K during the *Downsize Me* project: (1) what were your initial reactions to the *Super Size Me* movie? (2) How many calories did typical breakfast, lunch, and dinner meals have at McDonald's? (3) Using mean, median, and mode, find measures of central tendency in the data and create a box-and-whisker plot.

Because the student participants were ELL, their written work reveals some misspellings and phonetic spellings. It is important to value these students' cultural identities and to portray their ideas accurately. Therefore, their responses to the questions posed are presented verbatim. However, the Wikispace page did not have the capacity to save students' work. Some students inadvertently wrote over some of their previous reflections. Therefore, some of the data were lost before the project culminated. Student reflections that were not overwritten are shown in Table 3 below for three different dates. The first or last letter of the students' first name was used to identify each student and to categorize his/her reflections.

Like the teachers' reflections, students' reflections were analyzed for key words to find emergent themes. Given the context of the fast food industry it is not surprising to find that key words consisted of the following: eat(er) or eating (19); fast food (13); McDonald's (12); calories (9); (un)health(y) (8); movie (7); choice(s) (4); fat(ty) (4); and sick (4). The themes that emerged from the use of these key words were: (1) Mickey Who? (2) Where's the beef? and (3) Who is to blame for obesity? Analyses of data reveal how these predominantly black ELL students' cultures interacted with the mathematical task. Excerpts of both student and teacher reflections are presented to discuss each of the themes.

Mickey Who?

The first theme to emerge from the data evaluates the task for its cultural relevance. Needless to say, the teachers and I were surprised that the student participants in the GEAR UP program had limited knowledge about the McDonald's franchise and fast food in general. I had hosted two high school student participants in the American Field Studies (AFS) program (one from Ghana in 2004 and one from Thailand in 2006). The first thing they wanted to do was eat at McDonald's. However, this cohort of GEAR UP students was *not* representative of typical teenagers. Student excerpts reveal they were somewhat unfamiliar with fast food as a learning context. In some cases, these ELL students acquired knowledge about the fast food industry directly from the movie, *Super Size Me* (Spurlock, 2004):

I am not a big fast food eater. (Student A)

Table 3: GEAR UP Students' Reflections on the Downsize Me Project ($n = 10$)

Student	January 3, 2008 Reflection on *Super Size Me*	January 10, 2008 Reflection on Data Analysis Project	January 24, 2008 Reflection on McDonald's Menu
Student A	I think that eating fast food for a month every day for three times a day is very bad for your health. It can prohibit you from some of your daily activities. The movie could incorage many people to stop eating FAST FOOD daily.	Today was very productive. My team were able to finish our mini project. We started off by writing down what a person would eat for five days at McD: breakfast, lunch and dinner. My team tried to possibly have a very low intake of calories to see if a person can eat healthy at McD. That seemed impossible unless you want to eat packets of ketchup that have a total of 35 cal. per packet. Fast food restaurants had been on a verge of excelling in uncountable revenues. Many people are consuming fast food every day as a daily ritual. As the years go by our life become more chaotic and fast-pace. There are more demands for the oily and surprisingly tasty good fast food.	I think he could have made a lot of healthy choices like eating salads and other meals that aren't drenched in oil and other fatty materials. Although, I am not a big fast food eater, I approve some of McDonald's food choices.
Student D	This movie make me think about getting fat, having problem with your sthcomac, about your health. Save your health and be careful with some food. Since I watch this movie I will be careful and be very attention about what I be eating and keep myself out of some problem and be careful with my health.		
Student I			I think if you eat at McDonald's everyday at list if you eat three [items] for breakfast, lunch, and dinner you will get fat real quick.
Student K	I think he will get sick if he eat too much McDonald's.		
Student M		The things we did in Day 2, I can't imagine the calories getting into my body. If I am going to eat that [fast food], I don't think calories are good for the body.	Morgan Spurlock could not have made better choices at McDonald's for the menu items for those 30 days because it's not a good idea. He might get sick of all McDonald's food.
Student R	The movie got me into thinking about fast food. From now on, I will be careful about the fast food I eat.	Today, [after] the things we did, I don't think I will ever eat that kind of food because it has a lot of calories. The calories might be added up to 2,760.	Morgan Spurlock could have made better choices at McDonald's for his menu items for those 30 days because of the calories.
Student S	The movie is actually about the fast food we eat almost every day. We found the guy who got sick by having all the meals from McDonald's…was having it all the time till 30 days. This shows us that fast food is not really appropriate for our health because the tasty additives and the oil they use is very bad and unhealthy…. So I think we should stop eating fast food, but if it is hard for you to quit then eat once in a week.	I found that if we eat a whole day at McDonald's then you will gain thousands of calories, and at the end of the day you will feel weak.	
Student T	It [movie] was interesting because fast food makes people fat. It [movie] is so cool and interesting.	Today I learnt about the number of calories taken per meal at a restaurant called McDonald's	
Student W	I think he eat too much McDonald's. That's haw he get sick.		

If I am going to eat that [fast food], I don't think [the] calories are good for the body. (Student M)

I don't think I will ever eat that kind of food because it has a lot of calories. (Student R)

Today I learnt about the number of calories taken per meal at a restaurant called McDonald's. (Student T)

After implementing this project, analysis of a third document co-written by Mrs. C and Mrs. K in March 2008 reveals the teachers realized that it was not perfectly aligned with student culture:

The first challenge we had in the implementation was that the topic turned out not to be relevant for this particular group of students. Although they knew McDonald's, they do not belong to the "McDonald's culture"….

From the teachers' point of view, their goal was to pilot a project with the intent to enact CRP with a small cohort of students in an informal setting. To do this they developed a pilot project they believed would peak students' interest. Although culturally-based, few of the students were able to identify with the task. Lack of familiarity placed greater cognitive load on all of the student participants (Stein, Grover, & Henningsen, 1996). While no one could have anticipated that the ELL students in the GEAR UP program did not belong to the McDonald's culture, little was done to alter the problem context so that it would be more meaningful for them. Instead Mrs. C and Mrs. K conducted business as usual and did not deviate from the objectives or make adjustments to meet the students' needs after they discovered the students had low motivation to engage in the task. In short, the teachers did not read their students as well as they could have (Shade et al., 1997). The mathematical task, while well intended, was not culturally relevant to these students. Thus, the students were not able to develop cultural competence since the task did not draw upon their cultural experiences. Further document analysis shows Mrs. C and Mrs. K had some very important insights after the study:

This project was an interesting experience for us. It afforded us opportunities to think about and discuss between us what it means for something to be culturally relevant and also for whom. A culturally relevant project is not culturally relevant in itself; you really need to know the students you will be working with so that the context is really culturally relevant for them.

I, too, share some responsibility for the cultural mismatch with the McDonald's example. Unbeknownst to me, six of the eight teacher participants in this study did not belong to the McDonalds' culture either. If I had known this, I would have discouraged the teachers from using an unfamiliar context with students. Knowledge gaps may have inhibited these teachers from asking appropriate questions if they chose to use this context for learning. Just as the teachers needed to *read* their ELL students, I, too, needed to *read* second language teachers.

Where's the Beef?

The theme—*where's the beef*—was applicable to particularly aspects of the mathematical task: operations and resources. Students learned from watching *Super Size Me* that a typical diet should contain about 2,500 calories per day. However, as shown in Table 4, the minimum number of calories was 100 for breakfast and dinner while the maximum was 2,855 and 2,770 for lunch and dinner, respectively. When the teachers asked students for explanations, they discovered that a couple of students had selected jelly and ketchup packs for breakfast and dinner to keep the calories low:

My team tried to possibly have a very low intake of calories to see if a person can eat healthy at McD. That seemed impossible unless you want to eat packets of ketchup that have a total of 35 cal. per packet. (Student A)

Planning appropriate meals are not simply about counting calories but also about ensuring that vitamins and other important nutrients are consumed. No one would go to

Table 4: Student Data for Box & Whiskers' Plots

	Breakfast	Lunch	Dinner
Minimum	100	265	100
Lower Quartile (Q1)	300	440	250
Median	450	605	475
Upper Quartile (Q3)	520	880	611
Maximum	710	2855	2770

McDonald's and simply order ketchup or jelly. At the other extreme, one male student ordered too much beef. He selected several types of sandwiches for lunch and dinner, estimating he could consume 2,855 calories at lunch and 2,770 additional calories at dinner. While this scenario is certainly possible, pretending to order food from a menu without having the actual experience limited these students knowledge of the context.

These data also show that students chose heavier meals for lunch, which is reasonable; however they were not required to defend this choice. Also, students did not mention how the data could be interpreted in their reflections, which suggests that the teachers missed the opportunity to help these ELL students develop deeper mathematical knowledge about the meaning of the data. The outliers in these data had a definite impact on the visual representation of the box-and-whisker plots the students produced. For example, an extremely high maximum resulted in a very long whisker on the right side of the box for the data collected at lunch and dinner. As a result, the data for the box-and-whisker plots were skewed (see Figure 1).

Further evaluation of the mathematical task also reveals these teachers did not utilize the movie in the most resourceful way. The movie was shown in its entirety instead of in short episodes, which may have caused some students to become bored. However, the teachers' ability to critique themselves is quite remarkable. Given the outcome of the mathematical task, they offered the following critique:

> *…we talked about how to structure the project better. We think it was too open, and the goal was not clear for the students throughout the activity. Some of the ideas we came up with to improve the project are: to show only key parts and not the whole movie, and give students questions they need to respond to with information they can gather from the movie. Such questions would guide students on what to pay attention to when watching the movie. It would also help the class…to focus on the information we want to collect and discuss, in order to really connect the mathematics with the context of the project.*

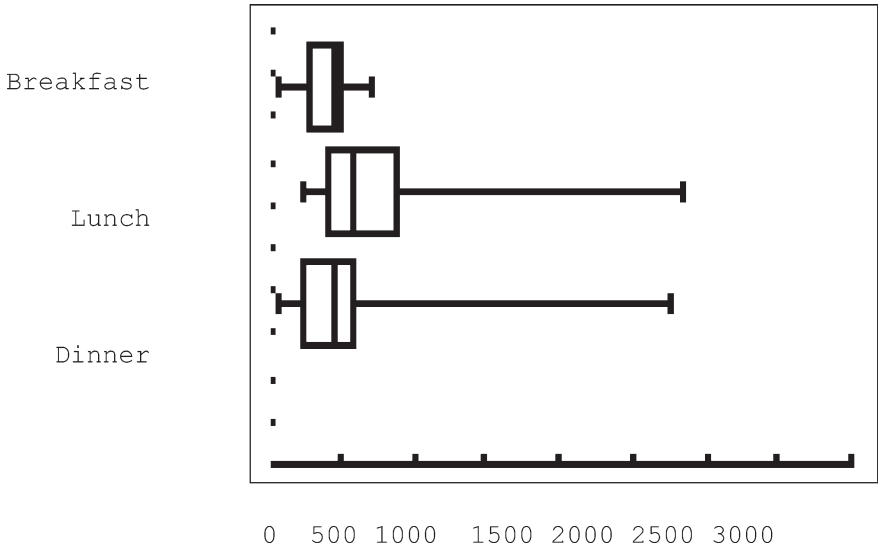
Students also had some difficulty at the resource level when it came to task implementation. Teachers did not provide scaffolds, such as dictionaries, to build students' vocabulary. They critiqued themselves for this oversight as well:

> *There were terms that were unfamiliar to them, like "croutons. Having students do the reflections at the end of each class, with little time and no other resources such as dictionaries, was particularly challenging for this group of ESOL students.*

In order to engage in classroom discourse, ELL students need to develop an appropriate register that is content specific (Campbell et al., 2007; Moschkovich, 2002). Thus, scaffolding becomes an important tool for vocabulary development and successful implementation of CRP with ELL students.

Furthermore, the Internet resources teachers provided (e.g., McDonald's menu) to collect the data were insufficient to carry out the project. Since the GEAR UP students had minimal background knowledge about the McDonald's franchise, they needed additional sources of information besides the movie and the McDonald's Web site to understand and complete the assignment successfully. At the time the project was implemented, a new rap commercial about Chicken McNuggets was aired on

Figure 1: Box & Whiskers Plots of Student Data



Caloric Intake for Menu Items at McDonald's

television. I showed the commercial to the teachers in the professional development course and asked them who the target audience was. The commercial, which can be found on YouTube, could have been another source of information. Since the school was predominantly African American, the students could have surveyed the student body to determine their fast food habits and analyzed the data. In addition to these ideas, teachers could have allowed the students to use Google Maps to investigate additional questions such as: How many fast food restaurants are located within a three-mile radius of their school? How does the number of fast food restaurants in high poverty zip code areas compare with the number of restaurants in more affluent zip code areas? While these suggestions were offered during the professional development course, time constraint was a factor for teachers at Langston.

Nevertheless, the cognitive demand for technology use was high and the mathematical goals of finding central tendency and creating graphs with the TI-83 plus calculator were met. The teachers showed high accountability when it came to students accomplishing the objectives and students were accountable for completing the task and writing their reflections on the Wikispace page. Thus, task implementation was successful at the product and accountability levels. Teacher reflections in March 2008 acknowledge the challenges and successes of their endeavor:

> *Despite these challenges, students had the opportunity to practice calculating the measures of central tendency with data they collected, so hopefully it was more meaningful for them than a set of data from a textbook. Students also learned how to create box-and-whisker plots using the graphing calculator, and they started to make connections between the data collected and the measures of central tendency. This helped them when they started to learn about measures of central tendency and box-and-whisker plots a few weeks later in the regular mathematics classroom. They were able to remember how to find mean, median, and mode quickly.*

Teachers' interpretation of the challenges brought about by the mathematical task and its implementation plan also provided them with important pedagogical knowledge that led to the following epiphany:

> *…we now believe "less is more." That is, from our point of view, we should try to accomplish less mathematical objectives in each session so as to give time to connect*

the data with the context and give more meaning to the mathematical constructs in terms of the context of the problem.

This epiphany suggests their beliefs about teaching mathematics and their identities as mathematics teachers had changed.

Who's to Blame for Obesity?

The third and perhaps the most important theme to emerge from the student data is the development of critical consciousness. According to the McDonald's Corporation Fact Sheet (2008), corporate revenues reached a record high of $22.8 billion globally, which accounted for a 6.8% increase in sales in 2007. Jobs in the service sector, which include the fast food industry, are predicted to experience the largest growth in the U.S. economy over the next decade (Bureau of Labor Statistics, 2008). Moreover, limited access to higher education coupled with the high cost of college tuition, increases the probability that students at Langston and other urban high schools may be employed in the service sector at some point in their lifetime. The projected growth of fast food chains will most likely impact the consumption of fast food and add to the nation's high obesity rate.

Students used what they had learned in the pilot project to make assumptions about obesity and the consumption of fast food. However, some students erroneously concluded it was the amount of food eaten and not the fat in the fast food that caused obesity:

We found the guy who got sick by having all the meals from McDonald's…was having it all the time till 30 days. (Student S)

I think he eat too much McDonald's. That's haw he get sick. (Student W)

Yet, some students were able to understand the relationship between eating habits and good health.

I think that eating fast food for a month everyday for three times a day is very bad for you health. (Student A)

Save your health and be careful with some food. (Student D)

I think we should stop eating fast food, but if it is hard for you to quit then eat [fast food] *once in a week.* (Student S)

A few students were quick to blame the consumer:

I think he [Spurlock] could have made a lot of healthy choices like eating salads and other meals that aren't drenched in oil and other fatty materials. (Student A)

Morgan Spurlock could have made better choices at McDonald's for his menu items for those 30 days because of the calories. (Student R)

Student A was astute enough to discuss the fast food industry's profits:

Fast food restaurants had been on a verge of excelling in its uncountable revenues. Many people are consuming fast food every day as a daily ritual. As the years go by our life become more chaotic and fast-pace. There are more demands for the oily and surprisingly tasty good fast food. (Student A)

Student A's comment that consuming fast food was a daily ritual implied that he understood how consumption was linked to profits. Yet, Student A also attributed consumer choices to fast-paced lifestyles. His beliefs are consistent with other students that the onus and, thus, the responsibility for one's health rested with the individual and not the corporate franchise:

…If we eat a whole day at McDonald's then you will gain thousands of calories (Student S)

…If you eat at McDonald's everyday…you will get fat real quick. (Student I)

On the contrary, Student M believed Spurlock's choices were influenced by the items on the menu:

Morgan Spurlock could not have made better choices at McDonald's for the menu items for those 30 days because it's not a good idea. He might get sick of all McDonald's food.

While the mathematical task Mrs. C and Mrs. K piloted with GEAR UP students was limited in its ability to promote cultural competence, it did provide students with the opportunity to develop critical consciousness. Students used inquiry to investigate Spurlock's claims that McDonald's food led to obesity. Students showed their ability to articulate assumptions, weigh evidence, make inferences, and draw conclusions. Thus, these ELL students were able to develop both functional and critical literacy.

Discussion

This study reveals teaching for cultural relevance is a complex enterprise. From this complexity, three findings emerge from this case study. First, Mrs. C's and Mrs. K's beliefs about what counted as mathematics influenced their mathematics identity and their enactment of CRP (de Freitas, 2008; Gonzalez, 2009). While these teachers exhibited characteristics consistent with caring and culturally responsive teachers (Gay, 2000), their initial beliefs about the nature of mathematics, mathematics reform, high-stakes testing, and adherence to school policy limited their ability to enact CRP in an after-school program. However, after the implementation of their pilot project, their beliefs and identities shifted as they learned from their practice what it took to implement CRP in the mathematics classroom. As a result of the project, their thinking about their own identity, the identity of the students, and how to implement CRP with ELL students changed. Specifically, teachers believed they tried to do too much in such a short period of time. After the study, they believed it was better to teach fewer concepts in more depth.

Second, while the culturally relevant pilot study did not resonate with the ELL students' culture, it did provide them with the opportunity to learn mathematics and to develop critical consciousness. Students successfully collected and displayed data to learn about central tendency. Moreover, they were able to make appropriate inferences and draw conclusions about the fast food industry and consumer choices. CRP cannot be prescribed or scripted. Novice teachers who choose to engage in CRP should not be judged by one or two attempts. While the goals of the professional development course were partially met (e.g. teachers learned what culturally relevant pedagogy was and developed pilot projects), teachers must be provided with ample opportunities to see CRP in practice as well as opportunities to enact CRP (Leavitt, in progress). Teachers have to learn from their practice and reflection in order to become experts. This case study confirms that culturally relevant theory and practice must be conjoined in the teaching-learning process (Leonard, 2008; Ladson-Billings, 1995b; Martin, 2007; Nasir et al., 2008).

Third, task implementation is critical to student learning. The main problem with the task as it was designed and implemented with GEAR UP students was task fidelity. The teachers' preoccupation with mathematical ends co-opted their attention to rigor. Low achievement at Langston increased teachers' tension about student performance on standardized assessments. If teachers focus too much on minimal skills and competencies, then there is little room for learning rigorous mathematics (Martin, 2007; Nasir et al., 2008). Problems at the resource and operation stages hindered students' potential to learn deep mathematics. Yet, there was some success at the product and accountability levels since incentives were sufficient to help students produce the desired box-and-whiskers plot.

While CRP is not a cure-all, it is essential to recognize the complexity of its capabilities. One of the biggest threats to culturally relevant teaching is routinizing it. CRP is not simply making connections to any everyday experience. It is crucial to understanding the teaching-learning process in educational spaces where the lives of teachers and students from different cultural, ethnic, and socioeconomic backgrounds intersect (Nasir et al., 2008). No culture is monolithic (Boykin & Toms, 1985). Teachers must be careful to avoid essentializing; that is, assuming one size fits all. While there are a common set of sociohistorical experiences that connect students of particular backgrounds together, neither the students nor their needs are necessarily the

same. Tapping into marginalized students' cultural capital requires teachers to examine students' individual identities and subcultures as well as their own (Leonard, 2008; Moschkovich, 2002). Successful implementation of CRP depends on teachers' abilities to: (1) read the students (Shade et al., 1997); (2) monitor the task to maintain student interest, high cognitive demand, and task fidelity (Henningsen & Stein, 1997; Stylianides & Stylianides, 2008); and (3) engage students in deep and rigorous mathematics while scaffolding to help them to acquire the background knowledge, mathematics register, and discourses needed to succeed (Boaler & Staples, 2008; Moschkovich, 2002).

Given the national agenda on mathematics reform in the U.S., CRP is underutilized. Instead a great deal of focus has been placed on movements such as "mathematics for all", which may actually limit achievement outcomes for black students (Martin, 2000 & 2009). This movement seeks to reorganize and redistribute access to mathematics education through an alignment of universal programs such as "Algebra for All" rather than meeting the specific needs of marginalized groups of students (Martin, 2009). Reform movements and policy decisions that do not acknowledge and value students' cultural identities are shortsighted. Equity and parity can never be reached as long as efforts continue to focus on raising everyone up using the same curriculum.

Our work is ongoing. Additional classroom research is needed to help teachers and researchers understand the nuances of culturally relevant teaching in mathematics classrooms. New questions about how teacher beliefs and identity continue to change over time must be addressed in order learn how to implement CRP effectively in secondary mathematics classrooms. For two high school teachers and me, the "*Downsize Me*" project allowed us to see ourselves and our role in the process, which is a humble beginning. When it comes to CRP, the words of Mrs. K leave a powerful message worth repeating: *"It probably raises more questions than solves problems at the beginning, especially in terms of preparing students for high-stakes tests, but I am convinced it is worth trying."*

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