ALGEBRA IS A CIVIL RIGHT:
INCREASING ACHIEVEMENT FOR AFRICAN AMERICAN MALES IN ALGEBRA
THROUGH COLLABORATIVE INQUIRY

by

Lisa Davies Gomez
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M.A. (San Francisco State University) 2001

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Abstract

Algebra is the gatekeeper of access to higher-level math and science courses, higher education and future earning opportunities. Unequal numbers of African-American males drop out of Algebra and mathematics courses and underperform on tests of mathematical competency and are thus denied both essential skills and a particularly important pathway to economic and other opportunities. Through Collaborative Inquiry by teachers this study explored increasing achievement in Algebra for African American males in a middle school Algebra program. This participatory research study was conducted in an urban middle school in an effort to address low levels of Algebra achievement. The study included a written survey, videotaped classroom lesson observations, debrief sessions of the videotapes, teacher interviews and a student focus group. The findings included emerging effective teaching strategies, race matters in instructional practices and student interactions and the power of teacher developed collaboration to change practice and increase achievement. An important finding was that race matters and if we expect the bleak condition for African American males in Algebra to change conversations about race must take center stage and include
instructional practice and relationships. The findings from the study will be shared with district leaders, teacher educators and the math community in an effort to support Algebra instruction in classrooms to increase achievement for African American Males in mathematics, thus closing the achievement gap and increasing student’s future learning and opportunities.
California State University, East Bay
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This dissertation was presented
by

Lisa Davies

It was defended on
March 28, 2012
and approved by:

Peg Winkelmann, Chair
Department of Educational Leadership

George Gagnon
University of California, Berkeley (Retired)

Debbie Bradshaw
Director of Assessment,
Hayward Unified School District (Retired)
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DEDICATION

A wise lady told me, “get your education, no one can ever take that away from you” through those words I am driven to be a learner every day.

Mattie B. Tolon, Grandmother

This dissertation is dedicated to my family for whom this work would have not been completed without their expectation, wisdom, support, and work in paving the road for me to follow.

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CHAPTER 1
INTRODUCTION

Mathematics and Civil Rights

“Mathematics Education is a civil rights issue,” says civil rights leader Robert Moses (2001, p. 5), who argues that children who are not quantitatively literate may be doomed to second-class economic status in our increasingly technological society. Unequal numbers of poor, African American and Latino students drop out of mathematics and perform below standard on tests of mathematical competency, and are thus denied both essential skills and a particularly important pathway to economic and other opportunities. Conversations about the mathematical needs of American students must focus not only on what mathematics the students should learn, but also on how we as a nation can insure that all students have the opportunity to learn it in the current school system.

Significance of the Study

Forty years after the United States Supreme Court’s pronouncement in Brown vs. Board of Education (Donelan, Neal, & Jones, 1994), we continue to be challenged to offer high levels of instruction in mathematics for equal academic opportunities, equitable classrooms, and positive learning outcomes “with all deliberate speed” (p. 376). In 2012, now 57 years after the Brown decision, many of the students failing both Algebra class and Algebra intervention are students of color who represent our largest subgroups - African American and Latino students. The tracking model that is in place for the course diminishes the life chances and future opportunities for our students.
because we have limited their experience for success and have created invisible boundaries (Donelan et al., 1994).

Six years ago when I arrived as an Assistant Principal in ZZZ Unified I discovered a vast achievement gap in mathematics in my middle school, a mere 8% of students taking Algebra were scoring proficient or advanced on the California Standards Test. As I reviewed the school data and conducted observations in the Algebra classrooms, the evidence illuminated was that math instruction and learning environments were less than conducive for high achievement. We had teachers teaching math without proper credentials, we had over-enrolled basic Algebra classes at the eighth grade level and, as a consequence, did not have the safety nets or interventions in place for the large numbers of students who were failing Algebra on a regular basis. After talking to other middle school administrators and district personnel, I discovered that my middle school was no different than the rest of the district. While we were meeting the 2004 California state mandate of eighth graders taking and completing Algebra we were in a cycle of failure.

To stabilize or, at least, reverse this downward spiral, the district had connected with county resources. ZZZ Unified Educational Services was working with the Alameda County Office of Education Mathematics Educational services. There was a Memorandum of Understanding that allowed county math coaches, under the direction of the county Math Director, to assist site teachers with math textbook scripting (lesson design), pacing guides, modeling, and coaching classroom pedagogy. In the presence of such support, there continued to be critical shortages of highly qualified effective math
teachers; union contract, traditionally protecting seniority, does not reward teachers for superior performance and inevitably causes high turnover for new math teachers. Teachers who remained after layoffs oftentimes resisted coaching, refused to attend the training sessions, or attended the trainings and did not implement the best practices that were taught.

As a now sixth year principal in ZZZ Unified School District, my abiding interest in mathematics and Algebra continues. We continue to show incremental growth in Algebra; our students were up to 24% proficient or advanced on the California Standards Test and had 13% proficient or advanced achievement levels in Algebra on the 2011 assessment. We continue to have new teachers teaching mathematics each year due to budget layoffs and the district and some sites are in Program Improvement status. We currently do not have the full service of the county office math coaches as we have had over the last five years, funding sources have decreased, and district educational services personnel has changed, thus lessoning the district focus on mathematics. After the layoffs, we now have one middle school math coach who has attended many county math trainings and professional development. The math coach was hired through the school district as a Teacher on Special Assignment (TOSA) and was sometimes referred to as Partner Teachers. He was an experienced math teacher who provided site teachers with teaching materials, pacing guide support, instructional modeling and observation, and attends the weekly math department collaboration meetings.

With the California state expectation of 100% achievement of students taking Algebra scoring proficient or advanced looming in the next two years, I am driven to seek
both continuing education enhancement and financial support for our teachers in order for them to offer a highly rigorous and engaging Algebra instructional program. It is my objective to use this research study to find solutions to our problems in the Algebra instructional program and to offer support to teachers to enhance their teaching. The completion and passing of the Algebra course is critical to the future of all students. I am interested in ways to support my site and faculty in implementing focused and rigorous standards-based Algebra curricula to increase student learning and thereby providing the initiative to boast their future opportunities.

**Primary Focus Questions**

1. What are the obstacles to African American male student engagement and success in Algebra?
2. What effective practices have been established for African American males’ engagement and success in Algebra?
3. Can instructional coaching impact teacher attitude, belief, and instructional practice to increase African American males’ engagement and success in middle school Algebra classrooms?

**Social Justice and Equity**

The absence of math literacy in urban and rural communities throughout this country is an issue as urgent as the lack of registered Black voters in Mississippi was in 1961 (Moses, 2001, p. 5). Illiteracy in mathematics is not unique to the Black community the way the denial to vote in Mississippi was but affects Blacks and other underserved groups at higher levels. Algebra has been assigned a certain role in
education as a gatekeeper to both science and technology. Math literacy and Algebra in particular, is the key to the educational future of disenfranchised communities. Social justice and equity in Algebra in the ZZZ Unified organization is not easy to find. Students of color and underserved students are not embraced into Algebra classes, they are not encouraged to thrive in Algebra, and sometimes become invisible as they enroll for multiple terms in the same class. Social bigotry has for years denied the cultivation of native gifts of children of color for learning and there is little effort by teachers to produce the desired achievement and reward. The learning conditions for students of color are often exclusionary, isolating, and lead to students not having a voice and being traumatized by ineffective instruction. The culture of mathematics classes is sometimes that of “the elite do well and the others do not,” thus defeating the organizations mantra of “all” means all, the district motto.

In the ideal world, social justice in Algebra classes would mean that all students are challenged academically, with culturally relevant, rigorous, and engaging instruction. The teachers would embrace the diversity in their classrooms and denounce those who lack strong values, lack strong teaching pedagogy and classroom management, and those who had negative assumptions of the brilliant potential of their students. The power would be removed from teachers, who subjectively do not allow students to enroll in high level classes because they think the students are not capable of learning, and transferring power to students and parents to have a voice in the decision making process in the math placements and exits. Alternatively, the teachers must justify their exclusionary decisions by documentation and other supporting evidence. Until then, as a school
principal and instructional leader, I am compelled to be a voice for the underserved and the students of color who have to endure poor teaching daily in their math classes and reject the status quo.

**Theoretical Framework**

This study follows the theoretical framework of Adult Learning Theory. Just as we should design schools as learning communities and around the principles of how children learn, so should professional development be structured around how adults learn (Hunt, 2003). To best understand teachers as adult learners is to define adult learning theories that pertain to the expected outcome of professional development. Jackson (2009) explains the adult learning theories as: humanist, cognitive, and constructivist.

- The humanist theory of learning establishes the perspective that an individual has the potential to grow, and further has the desire to grow. This theory points to the fact that people strive to be the best that they can be.

- The cognitive theory of learning is most effective, or at least, this is the one theory that resonates deepest with educational experiences as an adult learner. This theory focuses on the learner finding meaning in what is being taught and being able to apply the new information to examine previous experiences.

- The basis of constructivist theory seems to be a culmination of all the previously addressed theories, but it is completely focused on the individual making meaning of the learning environment.
The greatest impact I can make is to support teachers in building their content and pedagogy skills and principles as a ready rationale for what they articulate. From the literature and from my observations of the collaborative efforts between the teacher and math coaches, I have concluded that professional development and instructional coaching play a pivotal role in altering the current state of mathematics instruction in ZZZ Unified School District. In the review of the literature, I will consider research that informs my topic.
CHAPTER 2
REVIEW OF THE LITERATURE

This literature study explored the area of coaching through observation, collaboration, and interviews in an effort to better understand how coaching can influence instructional pedagogy and school reform. I reviewed the literature through the lens of a site administrator who is exploring ways to increase student achievement for African American males in a middle school, and across a school district, and examined effective instructional strategies. While I had assumptions about the level of usefulness and experience with professional development in the way of one class session, incremental sessions and through a coaching model, I am interested in synthesizing best practices in order to emulate the professional development models and strategies that lead to positive results. I attempted to introduce and cultivate such practices with my faculty and colleagues.

The literature review included definitions, theory, and information from studies in the areas of professional development, instruction, and coaching. From the literature review, I hoped to offer information on teacher’s belief and efficacy, teacher instructional practices for African American males students and professional development, and different ways this can be offered to teachers to enhance their classroom practice. The literature review focused on the following areas: adult learning theory, professional development and coaching models in mathematics, and effective instructional strategies.
**Adult Learning**

Adult learning theory holds that teachers must be allowed to move through the learning process at their own pace and be allowed time for repeated and guided practice of their new skill. Effective professional development suggests that access to someone who can help is imperative (Strickland & Riley-Ayers, 2007). In their work on measuring concerns of change, Hall and Hord (2001) noted that the success of any new policy in education is dependent upon the innovation being supported and implemented by the faculty of the institution. If the innovation is to be successful, the concerns of faculty utilizing the systems must be addressed (Hall & Hord). Hall and Hord (2001) offer a “levels of concern” scale to measure concerns teachers have about a specific innovation in an effort to support the staff to process the concerns through professional learning communities and professional development opportunities, and in turn implement the innovation. Concerns Based Adoption Model’s (CBAM) conceptualization of Stages of Concern provides a potential evaluative framework for considering teachers’ attitudes and offers a way to understand, than address, educators’ common concerns about change at all stages of innovation implementation. The CBAM Stages of Concern framework may be a useful heuristic for school-based consultants interested in assessing the attitudes and feelings teachers have towards an innovation, whether it is an individual intervention or a systemic school reform effort.

An effort to bridge teacher concerns with progress and professional development is vital. The professional development must be high quality and relevant to those who are implementing the innovation. The offerings must be ongoing and professional
development is a key mechanism to improving teachers’ instruction and students’ achievement (Desimone, 2011). Instructional coaching is a process to offer teachers ongoing professional development while implementing standards-based instruction. The Mathematics and Reading Professional Development Program provides incentive funding for teacher training connected to each district’s adopted instructional materials. The initial 2008–2009 budget allocated about $57 million for the program, but that was subsequently cut by 15%.

The California Mathematics Project (CMP), which is part of the California Subject Matter Project, focuses on strengthening teachers’ content area and pedagogical expertise. CMP has received state and federal funds totaling between $1.2 million and $1.4 million annually during the past several years. CMP estimates that an expansion of professional development for algebra and algebra readiness instruction would cost $8.5 million (EdSource, 2009).

The influence of outside experts and their ability to effect lasting school improvement often disappears as soon as the professional development sessions do. There are exceptions, and there are times when short term, external consultants can be useful; however, the transmittal model of professional development, wherein the goal is simply the transfer of information or the acquisition of skills, has shown itself to be generally ineffective in promoting desired change in instructional practice (Sparks & Hirsh, 1997). From our experiences in the classroom as teachers, we know that mere transmittal of information is not the way in which conceptual understanding is constructed (Brooks & Brooks, 1993).
In conclusion, Adult Learning Theories and Teacher Concern must be studied. The adult learning theories address the ways adults learn and shed light on factors that may inhibit adult learning. In order to have innovations and school reform implemented at the classroom level, professional development is key. Large amounts of state and district funds are spent each year on professional development with large amounts of resistance to the innovation due to fear and lack of understanding. The desired level of implementation of programs is often less than expected as well. This literature set described potential obstacles that may occur in implementing reform if teacher concerns and learning styles are not considered.

**Professional Development**

Teachers must become advocates and motivators for students to avoid the students being disempowered or “disabled” by their school experiences (Cummings, 1986). The system of professional development is deeply institutionalized in patterns of organization, management, and resource allocation within schools and school districts, as well as between districts, and a range of providers that includes freelance consultants, intermediate and state agencies, professional associations, and universities including the confines of federal, state, and district policies. This system is powerful, resistant to change, and well adapted to the ecology of schooling (Sykes, 1996). Guskey (2000) asserted that “one constant finding in the research literature is that notable improvements in education almost never take place in the absence of professional development” (p.8). Despite this universal recognition of the importance of professional development, educators and researchers do not agree on which professional development models help
teachers the most. If we are to create schools organized for success, today’s professional development must go far beyond adding a few more days or even weeks of in-service training to teachers’ calendars. Strong professional development opportunities must be embedded in the very fabric of public education (Hunt, 2003). Strickland and Riley-Ayers (2007) reported in their study that the most effective professional development occurs on site, as close in proximity as possible to the very classrooms where it is to be employed. Having the training and the implementation of the new learning in the local classroom helps teachers remain engaged. Professional development that is explicitly focused on the needs of students results in significant changes in practice, engages teachers in analysis of their own practice, and offers opportunities for teachers to observe experts; and to be observed by and to receive feedback from experts is most effective (Hunt, 2003).

In conclusion, constructive feedback must be sustained over time and intensive professional development is more likely to have an impact than short-term professional development. Professional development that focuses on academic subject matter (content), gives teachers opportunities for “hands-on” work (active learning), and is integrated into the daily life of the school (coherence), is more likely to produce enhanced knowledge and skills. Coaching as the vehicle for professional development is critical to offering teachers the opportunity to see the new practice modeled and then have the opportunity to practice with feedback, leading to a greater chance that the innovation will be implemented. In the next section, I will outline characteristics
imperative to peer and reciprocal coaching, an approach to professional development that builds on the strength defined above.

**Peer Coaching and Reciprocal Peer Coaching**

Coaching is not a single point in time intervention but rather a professional right of all teachers that enables them to improve their practice throughout their career (Gill, Kostiw, & Stone, 2010). Joyce and Showers (1982) introduced the concept of coaching as it relates to teaching. An alternative to one-shot professional development is peer coaching, “a confidential process through which two or more professional colleagues work together to reflect on current practices; expand, refine, and build new skills; share ideas; teach one another or solve problems in the workplace” (Slater & Simmons, 2001, p. 2). A math coach is an individual who is well versed in mathematics content and pedagogy and who works directly with classroom teachers to improve student learning of mathematics (Hull, 2009, p. 3). All forms of coaching must include professional and interpersonal skills to be effective. A coach must be able to establish honest and trusting relationships. Coaches have a great impact on helping teachers improve their instructional practices (Hull, 2009, p.3).

Peer coaching is defined as a formative, collegial process whereby pairs of faculty voluntarily work together to improve or expand their approaches to teaching. Houston and Weaver (2008) described a model of three major steps for peer coaching (a) consultation to identify the focus of the coaching, (b) classroom observation by the coach, and (c) a debriefing session where the coach shares his or her observations. Some teams may not use classroom observation, but instead review instructional materials or
grading practices. A meta-analysis of studies that examined the outcomes of staff development programmers have asserted that peer coaching, or mentoring, is more powerful, with regard to transfer of learning in the realm of teacher professional development, than any other training component (Gingiss, 1993. A considerable amount of literature on peer coaching suggests that professional development of teachers can be improved through observation, reflection, and the exchange of professional ideas and shared problem solving.

Another form of instructional coaching is reciprocal peer coaching, understood as a professional development trajectory in which pairs of teachers work together to support each others’ professional growth, should help teachers to acquire the knowledge, skills, attitudes, and values they need to improve their service to their students (Ackland, 1991). As teachers become more proficient with a teaching strategy, they may use reciprocal coaching to refine or reflect on their teaching to examine its effect on student learning. A key to reciprocal coaching is the feedback sessions where conversations and dialogue about practice and support are offered after the observation. Other forms of coaching include reflective coaching and cognitive coaching, which involve engaging teachers in ongoing dialogue about their classrooms practices and exploring their meanings.

Teachers who are provided with continued technical assistance coaching by peer experts are more likely to achieve greater classroom implementation of their training (Joyce & Showers, 2002). In a math study (Dobbins, 2010) based on coaching as professional development a dependent samples "t" test was used to analyze district quarterly mathematics data from the Northwest Education Association Measure of
Academic Progress (NWEA MAP) during the implementation of coached instructional strategies. The analysis indicated a significant increase in mathematics achievement from 3rd to 4th quarter for 400 students in grades 5-8, "t" (399) = -4.011, p=0.028. Success stories continue to emerge in the literature, although there is little empirical data to support any major claim, particularly in regard to the relation between peer coaching and student learning. For example, Sparks and Bruder (1987) reported that although 70% of teachers claimed that peer coaching improves student achievement, they offered little supportive data to defend this claim. Russo (2004) insisted that little data offered evidence that peer coaching leads to improved student achievement. Actual individual professional development processes have not been studied extensively (Zwart, 2007).

In conclusion to coaching model there is literature that suggests that mentoring is more effective with a coaching component. The literature suggests that peer-coaching models that are ongoing and include observation, modeling, and feedback, along with trust and a solid relationship, may have an impact on teacher practice. This section links the coaching to classroom practice.

**Teaching Strategies**

Learning activities for African American males should be designed to support student thinking and understanding of the content. Janice Hale (2001) states, “Instruction in school is not culturally salient for African American children, culturally salient content and modes of instruction can be used to motivate students to embrace academic tasks” (p. 13). She suggests in her book, *learning while Black* (2001); math instruction should involve students in dynamic, kinesthetic hands-on activities with materials instead of
relying solely on the textbooks and worksheets. Learning environments should focus on small collaborative groups with limited whole group activity to create a nurturing interactive situation between students and the teachers having harmony in the learning environment (Hale, 1986, pp. 75-95). She suggests that classroom learning be tied to career choices, developing talents and interests, and fun.

Shahid Muhammad, The Math Doctor, suggests in his book, *How to Teach Math to Black Students* (2003), that teachers utilize African American students’ curiosity and thinking skills to engage them in learning math. He recommends that teachers provide higher levels of questioning. While students are given equations to solve or simplify on a worksheet there should be an expansion of thinking through the use of “why and when to use the rule” questions, offer students time to conceptualize concepts and explain their thinking, and “having the student play the role of the teacher to explain the mathematical concepts,” (Muhammad, 2003, p.16.) He also provides ways for teachers to engage African American students by using visuals, drawing tables, charts to show comparisons, and having students design posters and illustrating mathematical concepts, which all utilize visual power to teach the content. Muhammad also impresses the use of math games and computers to support the relevancy and application of math concepts.

**Culturally Responsive Teaching**

Culturally responsive teaching offers instruction that is more consistent with an African American student’s cultural orientation. The teaching is focused through students’ assets, strengths, and intellectual capabilities. In her book, *Culturally Responsive Teaching*, Geneva Gay (2000) offers culturally responsive teaching to be
validating, comprehensive, multidimensional, empowering, transformative, and emancipatory. She described an example of culturally responsive teaching in mathematics as incorporating real life, relevant concepts such as employment data and consumer habits of various ethnic groups. She also suggested that culturally responsive teaching has a large influence of a meaningful student and teacher relationship and an active participatory classroom environment for student learning.

Geneva Gay (2000) concludes that culturally responsive teaching is:

- Validating: acknowledges cultural heritages of ethnic groups, incorporating multicultural information, bridges meaningfulness between home and school experiences, uses a variety of instructional strategies that are connected to student learning styles—group work, cooperative learning and active participation.

- Comprehensive: learning is connected to student’s identity and connections to their ethnic groups, teachers build a community of learners in their classroom, students become responsible for assisting, supporting and encouraging each other.

- Multidimensional: the teaching is integrated, bringing in cultural knowledge, student experience and contributions, opinions, values and reflection.

- Empowering: culturally responsive teaching allows students to be active in their learning building a foundation for students to pursue success. The
teachers acknowledge the risks of African American males engaging in learning and the need of them having successes along the way.

- **Transformational**: culturally responsive teaching supports students to be proud of their ethnic identities and cultural background defeating learned helplessness by developing knowledge, skills, and values needed to be socially critical.

- **Emancipatory**: culturally responsive teaching helps students to engage in thinking, to understand they must seek knowledge from various sources, to analyze history and experiences to shape their learning.

In the book, *Motivating Black Males to Achieve in School and in Life*, Kafele (2009) suggests cultural relevance in math can begin through teaching Algebra through its African origins. Kafele advocates that students need to know the origins of the math and that their ancestors played major roles in mathematics. He explains that lessons about Black mathematicians should be taught in classrooms in order for African American males to see men who look like them who have excelled in the field of mathematics.

**Engagement**

In his book, *The Art and Science of Teaching*, Robert Marzano (2007) suggests student engagement has a full definition, on task behavior, attending to instructional activities, invested cognition, and voice. Marzano uses an example of the teachers role for student engagement through the work of Emmer and Gerwels (2006), explaining that “the teacher needs to keep the activity moving and avoid interruptions by using good pacing”
Another tool for increasing engagement is teacher’s use of questioning techniques and wait time. A student will raise their level of attention if they realize that there is a chance of being called on to answer or comment on a question. Marzano (2007) suggests the use of games that focus on the academic content using questioning and competition that manage responses and give students time to think about the answers and time to process their own understanding. He explains that choral responses when used effectively can be effective ways to engage students, suggesting not having students memorize verbatim answers but to review important generalizations or principles about which there seems to be some confusion (Marzano, 2007).

**Teacher Inquiry**

In *Leadership Capacity: a Key to Sustaining Lasting Improvement*, Williams (2009) suggests schools that have been successful at sustaining school improvement build teacher leadership capacity through inquiry-based use of information to inform teaching and reflective practices. Inquiry-based use of information to inform teacher practice is the hallmark of a good teacher and good teaching. Williams (2009) explains it does not matter what situation that a teacher is in, an ethical teacher is always using hard data and action research to improve his or her practice. In particular, conducting action-research projects enables teachers to develop instructional strategies that actually improve student achievement (Williams, 2009).

Dr. Copland (2003) reported on findings from a longitudinal study of leadership in the context of a region-wide school renewal effort entitled *Bay Area School Reform Collaborative* (BASRC). In the findings, schools using the Cycle of Inquiry matured into
an accepted, iterative process of data collection, analysis, reflection, and change. The use of an inquiry-based approach built a common vocabulary, enabled leaders to articulate issues that the school aimed to address, and was key to building leadership capacity. The schools using inquiry appeared to progress toward functioning as learning communities. The study suggests teachers’ knowledge about how students perform across groups and across grades enabled the teachers to see ways in which they needed to improve, and the kinds of resources they required to begin making improvements (Copland, 2003).

Definitions

Choral Response: Choral responding is a teaching strategy in which all students respond in unison to a teacher posed question. Choral responding offers all students opportunities to participate and receive immediate feedback during instruction. It offers a way for teachers to quickly check for students' understanding.

Manipulative: is an object designed for learners to understand a mathematical concept by manipulating it. Manipulatives provide a method for students to learn concepts through hands-on and experiencing methods by manipulating the materials. Algebra manipulatives include Algebra tiles, algebra balance scales, and base ten blocks.

Technology: technology in this study includes the use of a Dell Laptop, ELMO document reader, BENQ DLP projector, ELMO remote pad, iPad2, and the Office PowerPoint program to create maps, graphics, and visuals.

Think Pair Share: Think Pair Share involves posing a question to students, asking them to take a few minutes of individual thinking time, and then turning to a nearby student to share their understanding of the concept.
Summary

While there are a number of factors that influence student learning in Algebra classrooms across this nation, this study in the area of Algebra will be supportive to teachers improving student learning at this current school site, the entire school district, and to others interested in increasing math achievement.

The literature suggests that the impact of innovation is enhanced with the presence of ongoing professional development including the methodology of instructional coaching.

The literature reminded me that it takes more than having the initial innovation implementation. Innovations require strong coaching and focused ongoing professional development because it takes time for teachers to be able to voice their concerns, to accept change, to and move through “change”. Teachers must be given time to comprehend the expectation of the innovation and to learn the components of the change as described by Hall and Hord (2001). Observing, modeling, and giving feedback are key components of coaching and collaboration and must be led by the teacher trusting their coaches’ expertise and confidential support. Strong coaching allows teachers to embrace new innovation. Following the adult learner cognitive theory, a teacher must be given time to make meaning of the innovation before being expected to fully implementing the practice.

In my role as principal I am able to spend time talking to the Algebra coaches that serve my school and other middle schools in the district. These conversations have become more than simply answering my questions about pacing and assessments to more of a dialogue about their experiences as coaches, including inequities and needs of
Algebra teachers and students across the district. I am confident that my relationship and collegiality with the math coaches at the county and the district levels augmented my participation in this action research. I trusted the study of how instructional coaching and professional development impacts the instructional pedagogy in middle school Algebra classes was critical to student learning outcomes. If students are being held accountable for mastering Algebra in the eighth grade then they should be offered the most rigorous and engaging instruction possible.

If the literature is correct then we should be utilizing instructional coaching as professional development to support teachers through the change process and support content knowledge and pedagogy to enhance performance of best teaching practices for our students. Further study may bring new questions about the strategies and concerns teachers have about teaching Algebra at the middle school level to meet the needs of all students, including special education and gifted and talented students. To reach the goals of No Child Left Behind and have 100% of our students taking Algebra scoring proficient or advanced on California Standards Tests, we must find solutions to what factors are barriers to the implementation of Algebra curriculum at high levels and offer support to the mastery of the content. Collaborative efforts such as peer coaching and reciprocal peer coaching may help build a professional culture that supports teachers who are knowledgeable and responsive to all students, regardless of their needs (Kovic, 1996).

Concerns were referenced by Jarvis, Lane, and Travis (2006), about traditional professional development training: the difficulty to personalize the training to make it unique to each person’s need, an assumption that people have the same starting baseline
of knowledge at the start of training, little consideration is given to the learning styles of people, making the content relevant to people’s work, little follow-up support is provided to people once the training has concluded, and the substance of the training soon becomes outdated at the conclusion of the training.

As I delve further into the literature and research on coaching for my dissertation study, I considered the components and variables of instructional coaching—trust, leadership support, and change. Teacher beliefs and perspective were critical to this study. Interviewing teachers and surveying teachers on the effect of the coaching on their classroom practice was beneficial in deducing further the impact of instructional coaching at the classroom level. The site case study was used to provide an in-depth examination of these same types of knowledge, as well as to probe how teachers utilize their coaching to build their knowledge and pedagogy in mathematical instruction. The case study offered the opportunity to understand how content knowledge and pedagogical content knowledge changed for each teacher as a result of professional development.

By utilizing the data from this study, and endeavoring to implement some of the literatures’ recommendations, I intended to cultivate the native intelligence of the underserved students by drawing equally on the strengths that reside in my teachers and colleagues. As a school leader, an African American woman, and a mother of an African American male, I found this work challenging, and it became my moral imperative to offer all students a high-quality education in an effort to allow them to seek opportunities that will support their future learning. I sensed the role of instructional coaching may have a transformational impact on teacher beliefs, practice, and growth, thus increasing
learning outcomes in students. I believed this study would contribute to radical changes in classroom instruction that must be made if we expect to get different results for our underserved African American male students and students of color in order to offer equity and social justice in mathematics in ZZZ Unified School District.
CHAPTER 3

METHODOLOGY

Introduction

Public education is the key civil rights issue of the twenty-first century. Our nation's knowledge-based economy demands that we provide young people from all backgrounds and circumstances with the education and skills necessary to become knowledgeable workers. If we do not, we run the risk of creating an even larger gap between the middle class and the poor. In a press release, Eli Broad stated, “this gap threatens our democracy, our society and the economic future of America” (2002). Teachers are the most important factors of student achievement (Darling Hammond, 1997). The nation can significantly improve by recruiting good teachers and supporting them with professional development (Hunt & Carrol, 2003).

Purpose of the Study

The objective of this research study was to identify instructional barriers to the Algebra instructional program and to offer support to teachers to enhance their teaching, thus closing the achievement gap for African American males in Algebra. This study examined the impact of instructional coaching as perceived by participating middle school Algebra teachers as a useful professional development technique for the acquisition of instructional strategies for diverse populations of Algebra students in the general education classroom.


Participatory Research

- Participatory Action Research study is to understand a particular concern of a social problem and then take social action to ameliorate it.
- It allows for the researcher to be a participant and guide the research through a cycle of inquiry.
- A cycle of inquiry that begins with taking action, becoming reflective of the process, adjusts, and then proceeds to the next action.
- A qualitative methodology framework.

Research Design

This study utilized Participatory Action Research. The qualitative methodology was used to capture participating teachers' perceptions of coaching and collaboration in the area of Algebra. The participants completed a written survey at the beginning of the study. The survey used Likert scale responses to gather teacher demographics, attitudes, and subjective responses around teacher beliefs about student learning and instructional coaching.

The co-researchers chose a time and date for me to video record their teaching using teaching strategies of their own choosing. The classroom visits were videotaped using an iPad. The videos were then shown to the participants during an agreed upon time. During the debrief sessions the teacher who was videotaped shared the content of the lesson and explained the teaching strategy used. The co-researchers offered comments and feedback to the teacher about the lesson and teaching.
A one-on-one interview was completed with each co-researcher using a digital recorder after the final debrief session to bring closure to this phase. During the interviews, the co-researchers discussed their participation in the study, shared their learning and interpretation of student engagement, and generated questions to be used with the student focus group.

An Algebra student focus group was convened from students enrolled in the observation classrooms. The students were randomly chosen by the researcher to answer questions about their experiences in their math class. The focus group was videotaped using the iPad. The questions the teacher co-researchers generated from the interviews were also used to gather data.

**Research Questions**

The study questions are:

1. What are the obstacles to African American male student engagement and success in Algebra?

2. What effective practices have been established for African American males’ engagement and success in Algebra?

3. Can instructional coaching impact teacher attitude, belief, and instructional practice to increase African American males’ engagement and success in middle school Algebra classrooms?

This district was chosen because large sums of funding and energy have been spent on county mathematics support while the African American male students continued to fail to gain access and engage in the Algebra curriculum. Student
performance continued to show minimal significant growth. This study took place in a large California bay area urban school district that supports 21,000 students. The district attempted to educate a large diverse population as 80% of the student body are students of color that included great populations of socio-economic challenged students, English Learners, and African American students. The study took place in classrooms of a middle school that had 30% African American students, five Algebra teachers, and district funded instructional math coaches where Algebra proficient and advanced levels of achievement is 13% as measured on the California Standards Testing.

**Participants, Subjects, and/or Samples**

Key participants in this qualitative study were middle school Algebra classroom teachers; additional participants included African American male Algebra students. Individual interviews provided opportunities for participants to voice their experiences, share important information about learning, and an in-depth picture of the impact of instructional coaching and collaboration on teacher practice at the middle school level in this district.

Purposeful sampling, intentionally selecting individuals at this site to learn and understand the impact of math coaching, was used. Teacher co-researchers came from a single middle school in the ZZZ district. The co-researchers were a pool of teachers with varied ethnicities and teaching experience.

**Data Collection**

School site student Algebra performance data was introduced in order to gain insight into the need for this district-wide study. In an effort to hear the voices, feelings,
and perceptions of the impact of coaching and collaboration, face-to-face interviews, classroom video observation with debrief sessions, and a questionnaire was used to gather data.

In an effort to lower the affective filter and increase the comfort levels of the teachers the one-on-one, face-to-face interviews took place at our selected teachers’ school site. The interview protocol included instructions and process for the participants and the interview questions to be asked. Additional probes to encourage the participants to elaborate and clarify their answers were utilized.

The math teacher collaboration for our Algebra teachers occurred weekly during the study, creating a pictorial of the impact of coaching and collaboration during the first semester of the school year. I initially offered a survey using Lickert scale rated answers to gauge teachers’ perceptions of the Algebra instructional program. Individual, one-on-one interviews using open-ended questions with the Algebra teachers to determine their perceptions of the impact of their coaching on teacher practice were utilized.

The first round of data collection for the teachers was at the beginning of the school year, in September 2011. The first research interaction included a survey using Lickert scale rated answers for all of the participants to gather information about the participant’s background and their perceptions of the impact of coaching prior to the beginning of the first quarter math collaboration. After the final videos debrief session the one-on-one interview with the teachers began as a tool to bring closure to the video section of the study and to gather questions from the teachers for the student focus group.
The interviews were recorded by a digital voice recorder, professionally transcribed, and later coded by me to establish themes and trends. The focus group included five Algebra student participants who were seen in the classroom observation videos and were randomly chosen to participate in the focus group. The students were video recorded as they were questioned as a whole group.

I was a participant observer as I took part in the classroom I observed and studied. I was active in the conversations in the video debrief sessions and I engaged as an inside observer as I recorded the video allowing me to be subjectively involved as well as to see the classroom setting objectively. As the school site administrator, I was mindful of my positionality representing the school, teachers, and the students in an effort to transform the teaching of Algebra through a change in teacher practice thus increasing student learning. I was aware of the power dimensions in being a researcher in this study and worked through what Anderson (2005), describes as reciprocal collaboration; the distribution of equitable power relations requires interdependence.

Classroom observations of the participants teaching was documented by video clips and reviewed by the participants. I completed one classroom observation in each of the self-selected participant’s classrooms that was videotaped to document the activity and interactions. The participants provided each other with instructional coaching after viewing and discussing the lessons. The debrief session transcription was coded for themes and to document the coaching and collaboration-related instructional practices. This included videos and conversations exchanged during the observation consisting of sounds, participant voice, and behavior of the participants.
This study timeline was approximately six months in length from proposal to completion. The interviews, questionnaire, and analysis of the data with conclusions and future work recommendations were anticipated to be held September 2011 to April 2012.

**Data Analysis**

My plan for analyzing the data included organizing the material by category: interviews, observations, and the survey. The interview data were analyzed to determine themes that reflect teachers’ perceptions of the impact of coaching and the instructional practice. A color-coding system on transcripts was used to distinguish the themes and trends in the data. The transcripts and field notes from the interviews and observations were reviewed several times, the first few times to gather the lean coding—a few major ideas from the responses. Each time the data was reviewed a more focused analysis was conducted using additional coding to develop a deeper understanding of the responses of the participants. The themes were placed in categories including major and minor themes and unexpected themes. Alternate perspectives and arguments to my themes were analyzed and considered as well.

A final phase of the study included a participant check. This was to support participants trust and supported participants rights and understanding of the interview data. A copy of the participant’s interview transcription was returned to the participants for their review. The participants were offered the opportunity to review their responses, to offer clarity, or to modify a response.

The data was reported in both visual and narrative formats. The report included the current condition of instruction, the methodology of the instructional coaching, and
the outcomes of the coaching, all in context of middle school Algebra. The visuals included tables and charts of the sample participant’s demographics, sample school site data, the instructional coaching model, and classroom set up from the site observations. The data findings included a narrative discussion, summarizing in detail the themes from the literature, research, and further questions, and participant’s challenges in providing high quality Algebra instruction.

In the final analysis I included limitations and suggestions for future study in the area of instructional coaching and collaboration in Algebra. I validated my findings and checked for my own bias and assumptions in the interpretation of the data. I built triangulation through the literature, participants, and methods of data collection in themes and descriptions in my research. I gave the participants copies of the transcripts of the debrief sessions, the interviews, and the survey results to offer member checking to ensure accuracy of the data. My dissertation committee offered external auditing as I proceeded through the process of researching to ensure authenticity of the study.

**Participant Safeguards**

In this time of high stakes accountability and focus on teacher quality this study was voluntary and participation was offered to be anonymous. I informed the participants of the importance of conducting this study and allowed them to make an informed decision to participate. All rights of the participants were safeguarded including the school district, the individual middle schools, the participants, and the students they serve. Following California State University East Bay’s Institutional Review Board protocol, the participant’s rights were protected.
The study supported staff confidentiality by being anonymous and using pseudo names and changing school site names when requested and as needed to protect participants and the institutions in which they work. The names of any student and the names on student work were removed to protect sensitive instructional materials, student assessment data, and the student’s confidentiality.
CHAPTER 4

DATA ANALYSIS

“I have the audacity to believe that people everywhere can have three meals a day for their bodies, education and culture of their minds, and dignity, equality, and freedom for their spirits,” stated Civil Rights leader, Dr. Martin Luther King (1964). The mathematical literacy of a middle school student is not only priceless to future earnings and opportunity, but an American Civil Right. The time teachers apply to planning and executing engaging lessons is instrumental in the student’s ability to interact with the content and to use thinking and problem-solving processes to construct meaning and to apply prior knowledge. The competence and efforts of classroom teachers are critical to offering students rigorous and engaging learning tasks that will be used to support future ventures to further their own educational pursuits and to reach their fullest potential.

This study examined the increase in academic achievement for African American males in Algebra through collaboration by a group of like-minded teachers. This study included a written survey completed by the participating teachers, videotaped lessons, debrief sessions, one-on-one interviews with the Algebra teachers in an urban middle school, and a focus group of five African American Algebra middle school students. This chapter includes the data from the survey, lessons, debriefs, interviews, and the focus group.

The Study Meeting

The study meeting included all of the Algebra teachers at the school site and was held at the end of their regularly scheduled weekly department collaboration meetings.
where the pacing guides, teaching strategies, students California State Testing assessment
data, and student work had been reviewed. I described the study of Increasing
Achievement for African American Males in Algebra through Coaching and
Collaboration. The study was described as being participatory research that included
Algebra teachers, the math coach, Algebra students, and the site Principal as active
participants in the study. The study was described to the five Algebra teachers as a study
of student learning and instructional practices that would include a written teacher
survey, videotaping and debriefing sessions, and a focus group of African American male
students from the Algebra classes. The teachers were told that this study would be using
their current district adopted textbook, materials, and pacing guide, and would span the
first quarter of the current school year. The teachers were informed that they would be
using our site adopted instructional and engagement strategies, including, but not limited
to, small group instruction, think pair share, and a focus on academic language to ensure
rigor and relevance of the Algebra content. Teachers were told they would be videotaped
by me teaching a lesson of their choice during the first quarter. They were informed that
the video lesson would be watched by the participating teachers during the debrief
sessions. They were advised that they would be able to read their transcripts of the
debrief sessions and could clarify language and content. Finally, the teachers were
assured that they would be given pseudonyms and would not be directly named in the
study.

The teachers were given the participant release form to sign which included a
video release section that allowed videotaping the teachers while they were teaching
Algebra and to use the video during the debrief session. The participation forms were signed and collected at this meeting. After the teachers signed the forms, dates were calendared for the video sessions with each teacher. Four of the Algebra teachers volunteered to be videotaped on certain dates and the video debrief was scheduled to follow on the next weekly collaboration date. The teachers agreed that the calendared videotaping and debrief sessions were subject to change based on our availability and time restrictions.

Survey

A written survey was used in this study. After the teachers signed the release to participate in the study the written paper survey was given to the teachers to complete on their own and to be returned in one week. The survey was a demographic inventory that included questions about the teacher’s prior collaboration with colleagues, their beliefs about Algebra learning by their students, and variations in instructional practices.

Teacher Interviews

The teacher interviews were conducted as a closure after teachers had participated in four of the teaching and videotape review sessions. As an active participant in this research study I interviewed the teachers individually in a one-on-one format. The interviews took place at varied times during the school day in my school office. The teachers were asked questions that were designed:

1. To outline the teachers’ thoughts on the experience of being part of a research study.

2. To generate questions for the African American male student focus group.
**African American Male Focus Group**

This focus group included five African American male Algebra students. The group was assembled from African American male students who were enrolled in Algebra and were observed in the classrooms of videotaped lessons. There were three eighth grade Algebra students and two seventh grade Algebra students in the group. Parental consent was obtained for the students to participate in the focus group; parents were informed of the objective of the study: “Increasing achievement for African American Males in Algebra through Collaboration.” Students were encouraged to ask questions about the study, the process and the objectives, and they were reassured that their participation in the study would not affect their grade in Algebra. Some of the questions used in the focus group were generated from the teacher interviews in an effort to ascertain students’ answers to the teachers’ questions about barriers to Algebra achievement. The students were released by their teachers to attend the focus group during the school day. The focus group was videotaped employing the iPad2.

**Results of Research Questions**

The case study is the format employed to encapsulate the participants’ profiles. Data sources included: surveys, video debrief sessions, teacher interviews, and a student focus group to answer the following studies research questions:

1. What are the obstacles to African American male student engagement and success in Algebra?
2. What effective practices have been established for African American males’ engagement and success in Algebra?
3. Can instructional coaching impact teacher attitude, belief, and instructional practice to increase African American males’ engagement and success in middle school Algebra classrooms?

Mr. Young

“Mr. Young already has it down right now” (Focus Group Student, personal communication, December 19, 2011) is how this African American male eighth grade Algebra student described his teacher’s instructional practice. Mr. Young is a fourth year teacher at this urban middle school and his student achievement data illustrates his role in the students learning; 93% proficient and advanced in his seventh grade Algebra student’s achievement on the 2011 Algebra California State Testing. He has spent the last three years as an intern Algebra and Pre-Algebra teacher and a long-term substitute. This year he has his Single Subject Math teaching credential and has accepted the role as co-department chair, which includes supporting instruction, managing and reporting department data, and attending district mathematics subject meetings.

Mr. Young’s students described him as being strict and someone who “teaches us what is needed.” They describe him as persistent, “he will call your mom in the middle of class if your homework is not done; that motivates us to do our work.” He was described by another student as being almost overly attentive to individual students, “he goes to help students even if he is doing something else, he still goes over to help; it gets boring sometimes because he helps too much.” He is a teacher who stays in his room after school and the room fills with students and the incessant chatter of Algebra talk.
Mr. Young balances both lecture and hands-on instruction to engage his students, offering a fast paced learning environment while bringing in technology through the use of online computer programs and videos. An African American male Algebra student portrayed Mr. Young as easy going, “he jokes around, he teaches and sometimes he puts humor into it, which is cool, you don’t always need the teacher to be serious” (Focus Group Student, personal communication, December 19, 2011). Mr. Young is challenging his own practice this year by integrating the scripted program with challenge problems and technology to enhance learning in his classroom.

Mr. Young’s instructional video was a lesson on mixture Algebra problems and was taught over a one-hour period. His video included footage of using whole group lecture instruction and paired think pair share opportunities to solve mixture equations as well as assistance for individual students. The lesson included a demonstration in front of the classroom of mixing colored liquids to show the changes in concentrations of the mixtures—one problem was 50% juice and 50% water, the next demonstration was 100% juice, and then 75% juice, followed by a transition to dirt mixtures. The lesson integrated the students solving problems with a partner, answering questions posed by the teacher, and Mr. Young demonstrating to his students how to solve the mixture problems using an equation on the remote ELMO Pad. The ELMO Pad technology tool is a plastic pad with a stylus pen that the teacher can write on while being away from the front of the room, the writing on the pad is displayed on the screen in front of the students. Mr. Young described this lesson as his best lesson of the year, “I had supportive materials, visuals
and technology. I got students thinking about the Algebra” (Mr. Young, personal communication, October 20, 2011).

The video included students talking in pairs about the mixture problem and describing to each other how they solved the problem. The video directly focused on two separate groups of African American students engaging in conversation about the math problem. This is video evidence of Mr. Young implementing an effective engaging instructional strategy in his classroom. The expectation of students working together was evident; one group of students was describing how they got their answer to other students. The second pair was a male and female student discussing how they arrived at the answer to the problem. Mr. Young explained that he just heard the chatter as he walked down the aisles and did not know this conversation’s content was on target, one of the teachers was moved to say “we need to listen to what students are saying and doing in our classrooms” (Mr. Young, personal communication, December 12, 2011).

The instructional practice dialogue among the teachers in the debrief session included many comments about Mr. Young’s use of strategies to engage students:

- To promote critical thinking.
- To play the devil’s advocate by challenging students with competition, and telling students, “you are wrong,” so they will explain their thinking and reasoning.
- To have students read the question to gain insight into what is being asked of them. This is what the problem says, one teacher stated, “the students need
language development, feed them math language” (Mr. Young, personal communication, October 20, 2011).

The safe debrief collaborative environment supported collegial discussion about the use of choral response. One teacher felt comfortable enough to state to the group that he is only getting 20-30% of the students to respond when he initiates choral response in the classroom. The teachers offered him ideas on ways to increase participation of all students. One teacher offered Mr. Young a teaching strategy from his Beginning Teacher Support and Assessment (BTSA) support provider training to get more students to engage and participate—“Say Something”—tell me something about the problem, say anything, to get students to explain their answers and thinking. Another teacher stated that he was going to try think pair share with his class from what he saw in Mr. Young’s instructional video. The video acted as a catalyst for the teachers to see an effective instructional practice with students and gave the teachers a clear image of how to explain think pair share and how it looks in practice. The teachers left the debrief session excited about the next teacher’s video being watched and debriefed. The next date was immediately scheduled, and my informal conversations with the participants were enthusiastic and focused on lesson planning and teaching.

Mr. Young acted as the chosen leader of the collaboration conversations in this study. He often began to dissect the instruction prior to the end of the video clips, beginning to write the math equations on the white board so that the team could see it. He offered the teachers honest critical feedback of their instruction based on the video
clips. He challenged the teachers to think about engaging students and offering rigorous Algebra instruction.

During his interview, Mr. Young shared that the videos had African American males in them, but not a lot of time was spent on them directly in the debrief session. He communicated that the group discusses the impact of instruction on African American males slightly but it is difficult to tell exactly what the impact was other than, “I’m looking at that kid and he looks engaged.” He described “student engagement” as students needing to be thinking about material being presented to them. He described students being cognitively activated, defined by their eye contact and thoughtful questions. “Did the student think about the problem is what I am concerned about, if I explain a concept and a student asks a relevant and a common question that most people think of when I discuss this concept, then that student is engaged” (need to reference as a personal communication). He revealed that he has about six African American males in each of his classes and three or four regularly ask thoughtful questions. Being a champion of student data, holding African American males as his focal students, monitoring his assessments by significant subgroups, and challenging the administration and faculty to reflect on the question, “How can we help support our African American males?” in all subjects, he re-orients the conversation to reflect that race does matter.

Mr. Young described the collaboration sessions with his peers as “awesome.” He elaborated, “The amount of information I gained in collaborating with my peers was vast. I gained information about their practice and my own practice, I can present the material another way so that students understand” (Mr. Young, personal communication, October
He shared, “I liked being able to see other teachers work” (Mr. Young, personal communication, October 20, 2011). He compared his usual district coach classroom visits with the coaching collaboration model that was used in this study.

I sit in the classroom learning all kinds of stuff and during this study on coaching and collaboration I was able to sit with other people to discuss what was important, what I think is important, what is good and what is bad, the multiple perspective on the same lesson was really powerful (Mr. Young, personal communication, October 20, 2011).

Through this study, Mr. Young built leadership skills as a co-constructor of knowledge and practice and has furthered the African American male achievement data reporting and conversations. His mentoring and instructional coaching of a new teacher have enhanced his own instruction, moving from only whole group lecture to instruction using pair work, think pair share, and implementing visuals to build relevance for his students.

Ms. Hart

“She is new, she is like an elementary teacher so she is not used to teaching, that is why Mr. Young is giving her instructions on how to deal with the kids” (Focus Group student, personal communication, December 19, 2011) is an African American male student’s description of his Algebra teacher. Ms. Hart is in her first year teaching, transitioning from a lucrative professional career to applying her Algebra content knowledge to teaching middle school Algebra. She is currently a first year intern Algebra
teacher enrolled in an alternative teaching credential program that meets weekly for three years.

Ms. Hart introduced her instructional video lesson as instruction on how to solve Algebra distance word problems. The video included Ms. Hart completing a full period of instruction including a review of the homework, finishing the lesson from the day before, a PowerPoint presentation, and student note taking. The lesson included the use of maps and cars in a PowerPoint presentation format using the ELMO pad to direct student’s attention to the cars movement, the equation, and to keep students focused on the lesson. The debrief conversation began with Ms. Hart self-reflecting on her instruction, “I talk too fast, and it’s hard to understand me sometimes, I just realized that” (Ms. Hart, personal communication, October 27, 2011). Debrief conversations about the pacing of the instruction of the lesson was the early focus of each debrief session. The participants spoke about note taking and how middle school students are still copying the notes and have difficulty being able to listen and take notes at the same time. The participants conversed during the debrief session about the instruction that included pacing and student engagement—agreeing that using relevant connections and visuals was good for students.

There was a suggestion by a teacher that the fast lesson pacing “pushes students to be at their best” and for the teachers to do plenty of checkpoints to let students know when they should begin writing and stop writing to listen and look at the examples. However, in contrast, Ms. Hart’s African American male student described the Algebra course pacing as, “too fast, she goes over the Algebra, she goes over more stuff, when I
ask questions, she tells me we are running out of time, by the end of the period, I forget my questions” (Focus Group Student, personal communication, December 19, 2011). This pace may create a barrier for students to learn and understand the content. A teacher explained to Ms. Hart and the group that “when students think of a question, that thinking is creating connections in their brain that actually makes them smarter” (Mr. Smith, personal communication, October 27, 2011). Mr. Young agreed, “You will feel like, Oh, my God, I’m running out of time” (Mr. Young, personal communication, October 27, 2011), but you will get a good question from your student if you wait. “It’s a reflection of you; you’ve got to give them time” (Mr. Young, personal communication, October 27, 2011). Ms. Hart reported in her survey that the pacing guide “helped me stay on track, but also feels like a burden to keep up at times.”

Ms. Hart describes student engagement as her students, “thinking about the concepts we are covering, understanding of whatever it is” (Ms. Hart, personal communication, October 27, 2011). “Some groups will be with you,” Ms. Hart stated, “they look like they were pretty with me” (Ms. Hart, personal communication, October 27, 2011). While the video included segments of her whole classroom, groups of students, including two African American males, are noticeably off task. They are looking around the room, head down, talking to other students around them. During the debrief session there was no focus or conversation about this off task behavior. In contrast there is another segment of the video that includes African American male Algebra students explaining how to solve the distance problem to someone next to them, there was no direct dialogue about these specific African American male Algebra
students performing well, bringing questions to her attention to the needs of her African American male students.

The teachers spoke about the visuals in her lesson, including that the pictures got the students attention and allowed them to engage with the words in the problems. In the debrief Ms. Hart described, “By having the cars as the visual helped students to compare the starting points of the problem and reminded students what they were really looking at and figuring out what was happening” (Ms. Hart, personal communication, October 27, 2011). The participating teachers compared this lesson to the way they taught the same lesson to their students, telling Ms. Hart that the pictures made the lesson more effective, allowed the students the chance to think about the “time” component of the problem, and the relevance of traveling to Los Angeles. The debrief session ended with the teachers discussing how to increase their use of visuals and models to engage student participation in the classroom.

In her interview Ms. Hart described her instructional intentions as:

I try to relate the Algebra to real life as much as possible, I try to make it as fun as possible, it is hard because it’s math and dry in general, I try to change it up so it’s not just the students listening to me or just not working on their own (Ms. Hart, personal communication, October 27, 2011).

She reflected in her interview that she “appreciated” being part of the coaching and collaboration study. In her interview she reported that the collaboration gave her different ideas for tweaking her lessons and gave her an appreciation of how other teachers were getting students to engage, whether it is African American or all students.
Ms. Hart was the most interested in watching her peers teach and being part of the debrief process, evidenced through our informal conversations during the study.

She said, “I don’t feel that I have a good understanding of how specific African American male students are affected, I think all of the skills I learned in general are useful for all my students” (Ms. Hart, personal communication, December 15, 2011) thus eluding the conversation about race and effective instructional strategies for African American males in her classroom. She explained that she thought the collaboration should keep occurring since, being part of the study definitely got the group into an instructional mindset, and “gave us a stepping stone to start the process of changing our teaching practices and restructuring the scripted Algebra lessons” (Ms. Hart, personal communication, December 15, 2011).

Mr. Garza

“Kids keep asking what, how do you do that? When the answer is right there, pacing gets slower, and I start to drift off” (Focus Group student, personal communication, December 19, 2011), an African American male student describes Mr. Garza’s Algebra class. Mr. Garza has taught Algebra for 13 years. A decrease in state funding for education brought Mr. Garza to this school site through an involuntary transfer three years ago.

Mr. Garza’s lesson was a whole group lecture on exponents using Richter magnitude scale to build relevance and student connection. He used choral response and tapping while students recited common exponents. Mr. Garza started the debrief session by sharing with the participants, “I use music and instructional videos to serve as a bridge
to youth culture and thereby make Algebra relevant and accessible” (Mr. Garza, personal communication, November 9, 2011). From the video, Mr. Garza has created a “family like” learning environment for his eighth grade Algebra students, who include African American and English Learner students. In the video he is often heard employing terms of endearment and favoring Spanish language to call on students to validate and affirm his middle school Algebra students.

Mr. Garza has wavering beliefs that his students are able to do Algebra; he responded in his survey:

assuming the African American male student has had consistent, appropriate math experience then they should be prepared for learning Algebra, however many social circumstances and systemic shortcomings contribute to the failure of the African American male student in the classroom, (Mr. Garza, personal communication, October 27, 2011).

He described his practice in the debrief session as “the lesson may have to slow down for the students to make meaning and to use little tricks and visual presentations” (Mr. Garza, personal communication, October 27, 2011).

One African American male in his classroom video was falling asleep throughout the lesson, without being recognized by Mr. Garza. Another African American male student in the video, who was holding his math book throughout the lesson, asked at the end of the lesson, “Mr. Garza, how do you simplify that?” pointing to a problem in the textbook. While Mr. Garza was lecturing and re-teaching the whole group, this student had independently previewed his homework and wanted to know how to do it. A student
reported in the focus group that a barrier to learning is that Mr. Garza tells too many stories and gets off track too much by correcting bad behavior. His debrief included conversations about the instructional barrier of “not enough time to teach the lessons.” Mr. Young reminded the participants that they have to train the students to keep up to the teachers pace, stop and check for understanding and connections, and give them processing time. Mr. Garza reported in the survey and debrief that he attempts to make certain his students completely understand the Algebra content and often invests extended time teaching a single day’s lesson without the concomitant hopeful result. He is constantly behind on the pacing guide and his students still do not master the content as evidenced on the exams.

Mr. Garza received positive feedback from the co-researchers for his use of a “noise,” drumming and tapping with the ruler and choral response to re-engage students to focus on the lesson. Mr. Young firmly asked the group not to mistake choral response and teacher tapping with a ruler as engagement since there is no evidence of students being taught or understanding the conceptual content.

In his interview, Mr. Garza, described student engagement as, “students should be active in their learning, generating ideas, I should be able to see them thinking.” (Mr. Garza, personal communication, December 19, 2011) While he uses a variety of instructional strategies to engage his students, his self-reported reflection on his instructional practice shows a limited student understanding of Algebra and a low level of understanding of the content. He is concerned about his students not being able to negotiate between the notes on how to do the math to thinking about and solving the
equations. In his interview Mr. Garza stated, “teaching that does not engage students to
the mastery level is not effective teaching” (Mr. Garza, personal communication,
December 19, 2011). He suggested that teacher credential programs and Algebra courses
for teachers should include a bridge from Algebra theory to Algebra real life so teachers
can make the math real for their students.

During the video debrief Mr. Garza voiced his concern that his students are using
hands-on learning with the Algebra tiles but are not transferring the math content, “I
don’t know if they have problems remembering or not, I’m assuming that they didn’t get
it, it doesn’t get the mastery it’s supposed to get because of our time crunch.” (Mr. Garza,
personal communication, October 27, 2011). He described his use of test correcting and
re-takes as a “way out” and another opportunity to learn the material and get a passing
grade without killing the students psyche.

In the teacher interview, Mr. Garza stated, “I enjoyed the research connections
participating in this study; it gave me insight to teaching African American students and
all students better.” (Mr. Garza, personal communication, December 19, 2011). He
applauded our Algebra teachers for their efforts in pushing their students a lot further
than in past years, “I think our district suffers from low expectations for our students”
(Mr. Garza, personal communication, December 19, 2011). Mr. Garza concluded, “The
time we spent collaborating during this study was well used as we viewed the
instructional videos and offered honest feedback to the teaching and practice, this is how
our time should be used” (Mr. Garza, personal communication, December 19, 2011). He
suggested that because we all have experience with different groups of students that we
share our experiences with each other in an effort to make adjustments to our practice and scripts to meet the needs of our students.

**Mr. Smith**

“You get a partner, it helped some students’ grades, you had a person sitting next to you; you could do the math yourself and have your partner look over the answers, if you forgot something your partner could help you,” (Focus Group student, personal communication, December 19, 2011) is how an African American male student from Mr. Smith’s class described working in partners in the class as a good activity.

Kind of fun some days, we do partner work some days, we make Algebra posters, like we look in our textbooks, copy it down, then he puts it on the wall, if you don’t know something you can look at the posters, we use drumming and rhyming to review for tests, (Focus Group student, personal communication, December 19, 2011).

These are class descriptions from Mr. Smith’s students about their work in his class. Mr. Smith teaches a two-hour block of Algebra to 20 Resource and Special Day class students, including five African American males, the last two periods of the school day. After years of trying to service all of his resource students in multiple classrooms, Mr. Smith chose to teach his resource-student case load in a two-block Algebra class this year in hopes of offering his students Algebra with support from his teaching and from the assistance of the paraeducators.

Mr. Smith’s lesson was a test review of solving equations using rhythm and partner work. The students were using drumming as rhythm to support understanding
and memory of the how to solve the equations. Two students were using real drums and drumsticks to keep a beat as the students in the class recited the steps to solving the equations using the rhythm. The students recited the lyrics of the steps as Mr. Smith guided them using the lyrics and as the students repeated the steps, some of the lyrics were modified by the students to meet the beat and rhythm.

Mr. Smith began his debrief session by describing his unique instructional pacing of the two-block class. In the first hour his goal is to use traditional lesson presentation and the second hour do it with music and art, “with the pace of this group, the traditional teaching, direct instruction, lecture and note taking, always goes into the second hour” (Mr. Smith, personal communication, November 13, 2011). He explained that with the group, “too much silliness breaks out for them to put their hearts and minds into it” (Mr. Smith, personal communication, November 13, 2011). He explained how when the drumming and echo are used with this class that is deemed “the lowest math students in the school” the students become “energized and engaged” in learning Algebra through the rhythm. He told the participants that more structure in making the drumming activity fluid and rigorous, that this drumming and rhythm will become a more viable teaching strategy, “I feel bad for beating that first problem to death, after watching the long period of time we stayed on the first problem in the video” (Mr. Smith, personal communication, November 13, 2011). He stated that his goal in using it was to “get his students to be able to apply something like the rhythm to anything, they can make a beat out of it and help themselves remember” (Mr. Smith, personal communication, November 13, 2011).
In the teacher interview, Mr. Smith shared, “I strive to develop relationships and teaching methods that consider, accept, and honor the cultures of all of my students including African American males” (Mr. Smith, personal communication, December 9, 2011). He was the sole teacher in this study who verbalized the connection of Algebra instruction to African American male student achievement. His survey response included, “our site is very direct about knowing and teaching the standards; our African American male students have our team working to develop strategies and teaching methods to support their individual needs” (Mr. Smith, personal communication, December 9, 2011).

Mr. Smith’s definition of student engagement included students having a critical understanding of Algebra. He shared in his teacher interview that he wants his students to know that the learning activities our teachers have students do is getting them to the objective of learning and mastering the content. He gave details during the debrief session from his test review lesson on solving equations about ways the rhythm and drumming could be used in traditional math instruction classrooms making the lesson more culturally responsive, by making up song lyrics, raps, and trying to sing. In the video his students kept changing the lyrics of rhyme they were reciting to solve the equations. Mr. Smith clarified the editing of the lyrics with the information that the students will change the words around to meet the beat while maintaining the content of the Algebra.

A portion of the video clip focused on one African American male who was working and participating throughout the lesson. Mr. Smith shared in the debrief that this
student used to be embarrassed when he did not remember something and now he is participating and he will answer a question that the whole class is stumped on. “I really make a point to mention his participation and (bring attention to his success) to the other students” (Mr. Smith, personal communication, November 13, 2011), it is so important to acknowledge his behavior. A student reported in the focus group that one barrier to his learning in the classroom is the disruption from other students talking and the teacher having to wait to teach. Another student reported that Mr. Smith makes the class wait to answer, to not steal other peoples think time, and once he got into trouble for yelling out the right answer, “if you take more than 15 seconds I might as well steal it from you, I know the right answer” (Focus Group students, personal communication, December 19, 2011).

During the interview, Mr. Smith shared:

African American males in particular have been - many of them have been - caught in teaching methods that shuts them down or causes them to rebel against this thing that they feel is not nurturing their soul causing them to grow as a person (Mr. Smith, personal communication, December 9, 2011).

He continued, “They get some of the Algebra that you think they can’t do, they can pull it off, and they do it more than you think they would” (Mr. Smith, personal communication, December 9, 2011) and just the difference of them taking Algebra instead of Pre-Algebra again is creating equity and access and “…a student perceptual and self belief - it is in their power, grasp it if they concentrate” (Mr. Smith, personal communication, December 9, 2011).
One strategy that Mr. Smith described in the debrief that worked for his students was strategic partnering for test review, “a test can be a learning experience as opposed to just an assessment, my students teach - (peer teaching) each other to correct their test questions, I think it builds up their confidence.” (Mr. Smith, personal communication, November 13, 2011). Mr. Smith shared that he taught factoring trinomials and told the students that they were going to work in partners and at the end they were going to take a quiz. He explained that the students began to work together, some finished the assigned problems quickly and moved to help other groups, and in the end all of them passed the quiz. He described how his students helped each other, transferring information to another student. During the debrief as a validation of this practice, Mr. Young reflected on a similar experience from his Algebra Intervention class, he shared that his students finished the problems and moved on to help others. He explained how he had to circulate quickly amongst the groups to keep them going. He stated that some days strategic grouping works and some days I do, and I say, “oh, crud” and have to reshuffle the partners. This conversation led to the connection of professional development for the teachers in the implementation and use of engaging pair and partner work that will benefit student’s collaborative efforts and develop their use of academic language in mathematics.

Mr. Smith stated in the teacher interview, “I love being involved with this study that’s looking at African American male achievement in Algebra. I felt like it was good, seeing what others were doing, looking at what they are doing, talking and reflecting” (Mr. Smith, personal communication, December 9, 2011). He stated that, “real power in
When talking about African American males, he described there being a spectrum, some need quiet time to focus and do their work, others need action and rhythm to energize them to work at a high level, and some work with partners to bring out the joy of learning. Mr. Smith stated:

This is not just the case for African American students, learning styles, creative actions and other types of learning must be recognized. I have been thinking about this and have been trying to implement different learning modalities into my practice this year (Mr. Smith, personal communication, December 9, 2011).

Mr. Smith said, “After watching Mr. Young using the visual aids in the mixture problems caused me to think of the problems differently and allowed me to re-teach it differently to get my students to understand the concept” (Mr. Smith, personal communication, December 9, 2011). He said:

Ms. Hart relating this geographical region to the distance and time problems made student’s be able to relate to something, this was a nice element to the problem where the student could buy into the problem. I would like to see Algebra grow beyond, to an understanding that math is an empowerment tool; you want to understand it in as deep as you can to empower yourself mathematically as a person (Mr. Smith, personal communication, December 9, 2011).
Mrs. Davies

As the sole African American female participant in this study I was not only active, but also an avid participant as we worked together towards an understanding of student learning and teaching in an effort to increase African American male achievement in Algebra. I wore numerous hats in this study as a researcher, school administrator, instructional leader of the school site, and learner. I have been site principal for six years, which has given me the historical vista of the revolving teaching personnel in the math department and the changing student populations we serve at this site. Being aware of my own circumstances in this study, I was conscious of my own biases.

The growing number of African American male students not passing Algebra continues to alarm me and makes my work that much more laser focused on student learning; I must monitor myself about placing blame. In this district the Algebra teachers have used the scripted Algebra instructional program since 2003. This is the first year that teachers have challenged the status quo of using the scripts alone; they have been implementing additional teaching resources, technology, and pair and group instructional practices, other than whole group direct instruction, to engage and increase student participation in learning. While we have begun to use more effective instructional strategies and activities to engage students, we have yet to see consistently high achievement on benchmark and midterm assessments.

My participation in the debrief sessions of the lessons engaged my thinking about what methodologies and practices teachers and students can utilize to increase learning in Algebra. Mr. Young suggested that we share the work:
Give a specific equity check task to complete at the staff meeting so that everyone will be interacting and be forced to come up with ideas and teaching practices for African American males, they too will see the importance and how they influence African American male achievement in our school. (Mr. Young, personal communication, December 12, 2011).

I found this request enlightening, a teacher is asking me to focus on our African American males directly; I quickly began to think, “What are my plans for the next faculty meeting?”

Adult learning theory was evident throughout this collaborative inquiry model. Not only did the teachers engage in conversation about Algebra but they also centered their conversations about teaching strategies that was meaningful to the teachers. The participants assumed responsibility for the video debriefs sessions. They had a self-selected facilitator who guided the participants through the debriefs and allowed the participants time to make meaning of the contents as they watched rather than supplying a handout of instructional best practices. The acknowledgement of the wealth of experiences that each participant brought to the collaboration meetings supported the effective, respectful adult learning environment. Each participant was treated as a learner, and I made it clear that my participation was as an equal, not as an evaluator. We came to a place to voice opinions freely in the collaboration meetings as we worked to improve our instructional program.

This study progressed from simply watching videos of teachers teaching to a professional learning community built around collaborative inquiry about student
learning. The participants were willing to change their adopted practices and infuse new practices and strategies once they observed the strategy in practice by a peer and the district coach had been verbalizing the use of hands-on Algebra tiles and making the content relevant to the students for years without success in changing teacher practice. Once the conversation was exchanged during the collaboration, there was renewed interest in the use of the Algebra tiles.

While race was not directly addressed in the debrief sessions, the importance of looking intently at increasing learning outcomes for African American male students was acknowledged by two teachers, Mr. Young and Mr. Smith. Student assessment data presentations presented by the math department have evolved to include African American males as a result of the request to give a “task to study African American male achievement.” The use of different teaching strategies, visuals, and technology has increased in the practice of the teacher participants.

I found the professionalism and time that was dedicated to video debriefs, peer feedback sessions, and time spent outside of the teacher participants’ contractual obligation speak unflinchingly to their commitment to algebraic excellence. The excitement in the participants as they watched the video clips of effective teaching and listened to ways the teachers felt they can replicate the strategies in other Algebra classrooms was priceless and a reward for our effort. Their request for being videotaped and participating in the group spread through the building, supporting this model for department collaboration and building capacity for professional learning communities throughout the school.
Final Analysis

Mr. Young

Mr. Young is a petite, White 20-something male Algebra teacher. He holds a single subject math credential and is in his fourth year of teaching. He is well respected by his peers. His own students encourage other teachers to watch him teach so they can be a better teacher. His teaching strategies have been shared with his colleagues through their observations in his classroom and conversations that follow. He has a positive rapport with his students and they know his intentions and expectations. He demands that his students learn Algebra, even if it means bridging school to home with personal phone calls to parents for missing homework.

Mr. Young is able to engage his students using his interactive teaching style, although he does not think he is doing anything special to support his African American students directly. Future work with Mr. Young may include pointing out the culturally responsive strategies that he is using that are effective for African American males, including his belief in their ability to successfully do Algebra, his safe and nurturing learning environment, and his use of computer assisted instruction in his math class.

Ms. Hart

Ms. Hart is a first year female eighth grade Algebra teacher. She is an intern, currently in her first year of completing a single subject credential. Ms. Hart has worked effectively to build her repertoire of Algebra instructional strategies and has begun to ask questions about her African American male students in order to understand them and support them all in the classroom.
As the study progressed, Ms. Hart’s math teaching became more effective and engaging as she maintained adequate classroom management to be able to teach the rigorous program with the visuals, making the content relevant to her students. She has implemented a consistent behavior plan that focuses on a tolerable voice tone; she has lowered her voice, implemented warnings and redirects to regain on-task behavior, and used students’ interest, games and youth culture to engage math learning. The connections between the visuals and the games has begun to be clear to her students as they have begun to engage in both the visuals and the equations and are able to explain their thinking.

She has begun to reflect on her practice from her conversations and observations of colleagues teaching, often changing practices and teaching strategies when others fail, and to implement strategies that are specific to her significant subgroups, African American and English Learners. Future work with Ms. Hart will include monitoring her African American male student assessment data to guide her attention to her students needs. Offering Ms. Hart time for reflection on her teaching, supporting her with tools to utilize technology, and balance checking for student understanding and process in solving equations will also support her instruction.

**Mr. Garza**

Mr. Garza is a middle-aged American Indian-Hispanic male in his sixteenth year of teaching and fourth year as a middle school Algebra teacher at this urban middle school. He holds a Multiple Subject Credential with a math supplement and was assigned to this middle school during the reduction in force four years ago. He is the teacher that
Dr. Sharroky Hollie (2011) refers to in his book, *Culturally and Linguistically Responsive Teaching*, as a “doubter.” He spends what amounts to an inordinate amount of time asking and taking math questions too far and still not getting student achievement results in his classroom.

Mr. Garza has the voice of equity and social justice. His strong voice demanding access to Algebra for all students is in conflict with his less than rigorous instruction, for example, by self adjusting the adopted pacing and teaching for “mastery” and never getting there.

From the video it appeared that Mr. Garza was teaching the same subject matter to all students mandated to take this class. While the lesson being taught was designed for well-prepared students in Algebra, his lesson could have been differentiated to meet the needs of all his students and at the same time offered the access to content that Mr. Garza professes to demand. The use of differentiating learning may have been beneficial to individual and small groups of students being helped instead of the whole group lecture and re-teaching model that was used.

Mr. Garza is the voice of change, equity, and access for students in Algebra and through this study his belief and participation in collaboration has increased. He even stayed past his contractual time during the debrief sessions. His doubting of students achieving in this districts adopted Algebra system has wavered a bit as he has observed his peers effectively enhancing and modifying the scripted program. Future work with Mr. Garza will include considering his expectations of students and using his interest in collaboration to offer him models of effective use of engagement strategies.
Mr. Smith

Mr. Smith, a soft-spoken White male, is in his fourteenth year as a teacher. He carries a tranquil aura. Mr. Smith is the teacher that understands the importance of focusing on African American male students, he is reflective in his teaching practice, and uses the department collaboration time to study instruction and fine-tune his own practice.

Mr. Smith understands the importance of understanding African American males and using effective strategies to meet their individual learning needs. He was the only teacher participant who acknowledged that he needed to fine-tune his teaching strategy, the drumming and rhythm, to become an effective engagement tool.

Mr. Smith teaches a two-period Algebra class. The class includes some resource students and students who scored Below Basic on the 2011 California Standards Test. The isolation of the resource students in this two-period Algebra class may be of concern as the students may lack successful student models to emulate and promote student tracking. Mr. Smith’s use of teaching strategies and higher order thinking skills may be stifled as the students in this class may lack the math numeracy to process and problem solve the Algebra without successful student models and support of their Algebra ready peers. Future work with Mr. Smith would include offering him the opportunity to work with different levels of Algebra students and to extend his use of pair work to support students thinking.
Mrs. Davies

During the video debrief meetings I had to work at being an active listener and not the fixer of all concerns. I found the rich conversations around student learning to be practice changing for the teachers. Teachers identify my participation in the conversations and the sessions as permission to challenge the status quo of teaching the script and make changes to the scripts in order to make sense for their students. One participant, Ms. Hart, remarked in the interview:

Mrs. Davies should be at the collaboration meetings to add to the conversation and help us make decisions, then we don’t have to wait until their next meeting for answers, share instructional strategies, share knowledge of the students, background, what has worked in the past (Ms. Hart, personal communication, December 15, 2011).

This reminds me that I may need to clarify my role in meetings with the participants and speak up when I cannot or do not support specific initiatives so that there is no confusion or misunderstanding.

In the debrief sessions, teacher interviews, and student focus group I heard the teacher and student participants report the pacing of the lessons to be fast, too slow, and a barrier to learning. A teacher described the fast pace as not allowing students to understand and master the content in the time allotted on the pacing guide. This will need to be further examined for evidence and modification to support student learning. I will also need to review school and district policy on testing and homework acceptance, the student participants shared their experiences with the current site policies that may inhibit
the students from excelling in their Algebra class. I expected the participants in this study to see their practice and to make meaning of how they were teaching their African American males in Algebra, I had no idea that they would not only see their practice, but change their practice through their own knowledge constructs, reflection, and peer feedback.

**Summary of Findings**

The power of collaborative inquiry is priceless to teacher practice. The time teachers spent together talking about student learning is beneficial to teachers not teaching in silos and having a safe forum for conversation about how to teach the Algebra standards. Their collaborative inquiry sessions validated the positive interactions between the teachers and on the teachers practice.

The impact of watching the teaching videos in the collaboration sessions have offered teachers a nurturing environment to strengthen student learning by implementing new teaching strategies. The teachers were “trusting” in being videotaped and participating in the debrief sessions, creating a gateway for conversation and the teachers to try the new strategy in their own classrooms. Teachers now ask questions about practices and strategies, focusing on African American males to drive their instruction.

During this study, learning took place for all participants. Teacher leadership was built through the teachers constructing meaning and knowledge about their teaching and student learning. Through the use of collaborative inquiry the participants were able to engage in reflective dialogue to think about their teaching and student learning. We have become a community of practice, taking responsibility for our practice and student
learning, where learning is not only a means to an end; it is the end product (Wenger, 2006).
CHAPTER 5
DISCUSSION

The solution to the underachievement of African American children was not complex and did not require the implementation of alternative teaching techniques or reform models. Rather, the solution was a moral and commonsense one: We must provide every child with high-quality educational services. (Tillman, 2008 p. 591)

Algebra is the gatekeeper to high quality educational endeavors. Students are limited in the courses they may enroll in, especially higher science and math courses, if they have not successfully passed Algebra 1. It is to be noted that the current educational structure, specifically Algebra, is in a pathological state. Students exhibit low or minimum understanding of the Algebra standards. There is a shortage of highly qualified mathematics teachers and a lack of professional development to support teacher’s conceptual understanding and instructional pedagogy.

This study was conducted based on my drive to increase achievement in Algebra for African American males. I have witnessed few African American males achieve and pass Algebra 1 without any problem. More often young African American males rebel against and fail Algebra multiple times before finally giving up and sometimes dropping out of school when they do not pass the high school exit exam. After reading Robert Moses’ (2001) Radical Equations, I became intrigued by the impact of his Algebra Project and was motivated to bring change to remedy the depressing Algebra plight for African American males. This study focused on increasing African American male achievement in Algebra through teacher collaborative inquiry.
The Researcher

As researcher, site principal, and instructional leader of an urban middle school in the San Francisco bay area I was able to actively participate in the study as a co-constructor of knowledge and practice. As an active participant, I was able to ask questions and observed the process of collaborative inquiry. While I participated in generating, collecting, and analyzing the survey data, the real work was in videotaping the lessons and participating in the debrief sessions. As researcher and as site principal, I assured the co-researchers that their participation in this study was voluntary and had no bearing on their annual contractual teacher evaluation. The researcher evaluated none of the co-researchers during the study school year. As researcher participant and co-developer of the critical questions for the teacher interviews and co-creator of the questions for the African American male focus group, positionality had to be monitored during the study to maintain a safe environment for the participants to offer each other constructive feedback and to have conversations that highlighted some of their weaknesses.

The Co-Researchers

This study was conducted in an urban middle school in an effort to address the dismal Algebra achievement that the school and district were experiencing. There were four teacher co-researchers in the study who taught an Algebra 1 course, only one of the teachers held a single subject math credential, the remaining three held supplementary math credentials and subject matter competency, and all are considered highly qualified
by the state of California. One of the participants was an intern teacher. Three of the four teachers were male with one female teacher participant.

Three of the co-researchers were Caucasian and one was Latino. The school’s enrollment was 640 students, with an African American student population of just under 30%, and a Latino student population of 40%. The co-researchers viewed the videos and were able to examine effective teaching practices and provide constructive feedback to one another. I interviewed each co-researcher individually at the conclusion of the four video sessions.

The Guiding Questions

The participatory action study evolved from a study about coaching and collaboration to a study based on Collaborative Inquiry. The learning that occurred as the co-researchers spent time together watching the videos, conversing about student learning, and offering each other feedback in the debrief sessions became the focus. The study questions became:

1. What practices promote academic success for African American males in Algebra?

2. How do teachers define, promote, and recognize student engagement (particularly among African American males) in Algebra lessons?

3. Does collaborative inquiry impact teacher attitude, belief, and teaching practices to increase the success of African American males in Algebra?
Literature on Collaboration

The literature is supportive on the positive impact that high quality collaboration and peer coaching can have on teacher practice. Peer coaching is a favorable method of teacher professional development. In order to utilize peer coaching in a workplace, certain components need to be in place. Joyce and Showers (2002) suggested that these components are (a) to provide time during training sessions for teachers to solve the problem of finding time to meet to analyze, discuss, and make decisions; (b) to form peer coaching teams on the first day of training sessions to allow them to experiment to find the best way of working together to make a difference in the classroom; (c) to provide structured activities for teams to engage in to practice teamwork; and (d) to allow peer coaching teams time to decide how they will monitor the initiatives they will use as well as the effect of the initiatives on their students. Trust, commitment, administrative support, non-threatening environment, time constraints, and teacher attributes were the variables found to affect peer coaching. The survey, video debrief sessions, and teacher interviews were all non-threatening for the participants and, as the site administrator, I assured the participants that the study was in no way evaluative. The dates and times for the debrief sessions and interviews were flexible to meet the needs of the participants.

Jarvis, Lane, and Travis (2006) in discussing what is special about peer coaching, noted certain variables that enhanced the likely success of coaching. These variables are (a) confidentiality and honesty of the stakeholders, (b) commitment to the coaching process, (c) support of management, (d) a culture that supports learning and development within the organization, (e) ongoing communications within the organization, and (f) time.
This study was a successful conduit in creating an environment of learning, a Professional Learning Community. Through this study the participants built trust within their Algebra teacher community. The teachers were eager to learn from each other and were willing to de-privatize their practice by being videotaped and participate in collaborative inquiry around student learning. Their willingness to maintain their rich collaborative inquiry culture morphed into regular classroom observations of each other. The participants began using their preparation periods and lesson planning to infuse culturally responsive teaching strategies to engage African American students. Learning is not only a means to an end; it is the end product (Wenger, 2006), which was the final product for the participants as they took a collective responsibility for learning and changing.

**Summary of Findings**

The following section provides a thematic analysis based on data from the teacher survey, the teacher debrief sessions, teacher interviews, and the African American student focus group.

**Student Engagement**

Students must be focused on the instruction in their classroom to excel in their academic endeavors. Student engagement factors that emerged included: instructional practices, instructional policies, and student to teacher relationships. For instance, the teacher who has strong instructional practices and relationships with students voices that the pacing “pushes students to be at their best” (Mr. Young, personal communication, October 27, 2011). A student described another teacher as “slowing down too much”
(Focus Group student, personal communication, December 19, 2011) in a third case, the new teacher described herself, and is described by the students, as “moving too fast” (Focus Group student, personal communication, December 19, 2011).

In an effort to increase achievement for African American males in Algebra the pacing guides for the Algebra course will need to be discussed further with the teachers and reviewed to meet the needs of the students and to ensure all essential standards are taught each school year. As the participants work together in their collaborative inquiry group sessions the pacing can continue to be addressed and supported as needed to meet the learning needs of the students.

During the focus group, one student mentioned student interruptions as a barrier to his learning. This student reported his classroom as being, “always loud, so with so many distractions, you can’t get it all, he has to stop to get someone to stop talking,” (Focus Group student, personal communication, December 19, 2011). As a co-researcher examining the video we did not find students distracting one another. I asked the young man about the distraction, he reported that the distraction was one girl in the classroom. This is an interesting finding given that there is a common stereotype that classrooms with African American males will be out of control. This was not our finding and this one comment was unfounded.

All four teachers defined student engagement, as “getting students to think.” Teachers must implement Algebra instruction that moves beyond having students memorizing steps and facts to thinking and asking questions. Teachers must provide the opportunity to think using high level questioning, going from simply solving equations to
higher order activities. Instead of proclaiming “this is the solution”, asking the students, “is this the solution, why or why not?” is critical.

**Emerging Teaching Strategies**

Culturally validating and affirming teaching that includes using a wide variety of strategies that are connected to different learning styles (Gay, 2000) have shown to be effective with African American students. The use of interactive strategies, think pair share, and productive group work are effective. The participants in this study used these strategies to engage their African American males in learning Algebra, and included the use of visuals, maps, and technology. The Algebra content was made relevant to students’ lives and knowledge base through the use of maps that included a trip to Los Angeles, a trip that is in students’ vernacular, and the use of real liquids to illustrate a connection to mixture problems. Strategically using rhythm, rap, and rhyme to capture students’ attention can increase students’ active participation in the classroom, and should be used while maintaining attention to efficient use of instructional time. Used well, rhythm, rap, and rhyme can be tied to curricular objectives.

Enhanced understanding of the strategies by the participants and the increased effective use of the strategies can be transformational for African American males’ achievement in Algebra. In this study two teachers were using instructional strategies to transform the achievement of African American males in Algebra. As the other two teachers integrate effective strategies more African American males will achieve success. The key will be high teacher expectation for student success combined with effective use of culturally responsive instructional strategies woven across and through the content on
an ongoing basis. The collaborative inquiry will allow time for the teachers to support each other with successful implementation of engaging instruction that both affirms and validates students’ culture and language and high expectations for African American male success in Algebra.

**Power of Collaboration**

This study became a form of lesson study. Lesson study is used for teachers’ professional development in Japan (Lewis, Perry, Hurd, & O’Connell, 2006). It was used in this urban middle school math department as the participants examined and analyzed their own instructional practice. The commitment of the teachers in the study was illustrated in their prompt arrival for the interviews, their pleasant demeanor during the interviews, their willingness to complete the teacher questionnaire, and most importantly their willingness to take the risk in being videotaped to share their instructional practice and experiences with peers during the video debrief sessions. The participants in the study were very cooperative and focused.

A benefit that evolved from this study is the increased desire for collaboration inquiry. The structured time created a supportive network for the participants and impacted both their instruction and awareness of student learning. In this participatory research study the conversations moved away from traditionally blaming the students and their parents for lack of achievement to coherently analyzing instructional practices, sharing different perspectives, and creating a safe space where everyone’s feedback was appreciated and valued. This study was a process of “opening” our own eyes and seeing the injustice in the lack achievement for the African American males. This process
enabled us to see the classroom through “different eyes” - the students’ eyes (Cahill, 2007).

**Teacher Leadership**

“Constructivist leadership,” both learning and leading (Lambert, 2003) was evident in this study. Together the participants were able to construct meaning through inquiry, participation, and reflective dialogue. The participants generated the collaborative inquiry of the study. The co-researchers led the dialogue and learned from each other’s teaching as they built the inquiry base to inform their teaching and student learning. The development of these teacher leaders will build capacity for the collaborative inquiry to continue to grow in this school. Teachers from other departments at this middle school are already asking if their team can use the model of collaborative inquiry used in this study.

The collected data from the teacher surveys, video debriefs, interviews, and focus group conversations showed that some variables that affect student achievement in Algebra for African American males include effective use of appropriate teaching strategies, understanding of student engagement, and teacher belief in student achievement. In the next section I will discuss what was not discussed in the surveys, interviews, debrief sessions, or focus group conversation, which is that Race Matters.

**Race Matters**

Though the study focused on African American males, the student assessment data was analyzed on African American males and each of the videos included a focus on African American male students; race was not discussed. The conversations during the
debrief sessions addressed “all students” and did not focus on African American male students. Though the videos captured African American male students who were clearly off task and not focused at times, there was no direct conversation about any of these students in the debrief sessions. Without direct prompts and focus on the African American male students, the participants reverted to speaking about their students as a whole without disaggregating the African American males as the focus. This pronouncement confirms that race continues to be a challenging topic for discussion.

If we expect African American males to see themselves as Algebra scholars a connection between students racial, academic, and mathematic identities must be explicitly linked for both teachers and students to see. Teachers must strive for “cultural competence” and avoid marginalizing their African American students out of ignorance (Institute for the Study of Social Change, 1991). Teachers must take time to focus and learn about their African American students and be committed to eliminating “stereotype threats-lazy, don’t want to learn” of African American children extending beyond raising test scores (Davis & Martin, 2008, p. 18). Research has shown that teachers who know or get to know their African American students provide them with a more enriching educational, mathematical, and social experience (Ladson-Billings, 1997).

In my role as both the co-researcher and social justice leader the focus on knowing that the school is not the best until the students with the greatest needs are given the opportunity and access to a rich, rigorous academic program cannot be lost. Teacher professional development using collaborative structures and context that makes sense of race and gender roles must be maintained for teachers to make sense of their students
needs. Programs and student placements must be reviewed to not block both emotional and academic success for marginalized children (Theoharis, 2009).

**Conclusions**

There were many affirmative conclusions from conducting this study. For eight years there has been an instructional coach and a focus on the use of visuals and engagement strategies to increase student achievement with little increase in student achievement. Teachers have not implemented these strategies and we have seen little increases in student achievement. In this study the teachers took “ownership of their practice”, implemented their own loose protocol for collaborative inquiry, and made changes to their own teaching through feedback from their peers.

During the regularly scheduled collaboration sessions the participants enjoyed observing each other teach and were able to provide each other with honest coaching and feedback. The group began to rely on the time together to review their practice, plan lessons together, and implement effective instructional strategies. Through the collaborative inquiry, teacher leadership emerged. After the observed teacher analyzed his or her video, one strong teacher took the lead on giving the initial feedback. All of the teachers stepped up and became active in the change in practice. The videotaping and debrief sessions became part of the department’s practice, with Pre-Algebra teachers asking to be videotaped and to become part of the community of learners.

Research shows that school principals play important roles as catalysts for change, protectors of vision, and leaders of inquiry, and have been successful in promoting shared leadership functions that protect the school’s reform efforts. Principals
in schools where shared leadership has taken hold appear to apply less role-based authority, opting instead to engage in framing questions and problems, and providing space and support for inquiry to occur (Copland, 2002). As I continue to work with the co-researchers it will be critical for me to move our school reform by building and supporting the emerging teacher leadership at this site. In an effort to support their professional learning community I will need to offer the teachers continued time to work together while posing critical questions about student achievement and teaching practice.

The knowledge generated from this study has been shared with other school site department chairs at this middle school with the anticipation that a similar professional learning community will be replicated throughout the school and be shared with the district. The experiences and shared learning has also been shared with interested middle school and district administrators. In order to create systemic reform for this districts teacher collaboration, I will need to showcase this collaborative inquiry model to the district leaders and to secondary curriculum decision makers.

**Limitations**

One limitation to this study was the small sample size. The teachers were from a limited number of school site Algebra teachers. The students were all from one purposeful sample, they were enrolled in the Algebra 1 course, were seen in the videotapes, and were the same students present for the focus group. Replication of the model of collaborative inquiry using a larger population of teachers and students across the country might corroborate the generalizations beyond this study.
Working with willing participants could be considered another limitation. The participants and co-researchers created a safe space to talk about student learning and their own teaching practice. They offered constructive feedback to each other during the lesson debrief sessions without being prompted or told how to do it. This study would not have been possible if the participants had resisted being videotaped or joining the collaborative inquiry sessions. In order to support all teachers working collaboratively, time would have to have been spent laying the foundation for a safe and trusting adult learning environment.

An African American male only study offered a focus on the achievement of one group of students. The African American males were chosen because they are a significant subgroup as measured by the California Standards Test and their Algebra scores were the lowest in this particular school site. The study and finding may have been different with female African American students or a different significant subgroup at this school.

A final consideration is my role as a co-researcher in the study. I knew I had a chance to make a difference as a leader of color when I was placed in this school eight years ago. In this study I was able to walk in the role as school leader and learner to construct meaning with my teachers to create changes to our program. While I was an active participant in the study I realize that my role as the principal of the school may have influenced the process and final data. While the participants volunteered to be in this study they may have chosen to do so because I asked them personally as the principal, not as an independent researcher. The participants knew my expectations of
increasing student achievement for African American males in Algebra at this school so their participation in this study and the changes in instructional practice may have been influenced by my position as the principal and not simply a product of the collaborative inquiry.

**Implications for Practice**

An important finding in this study is that teachers changed their practices when they saw an instructional practice that worked and saw the positive effects on students from the same school population. Collaborative inquiry is a staff development tool that is powerful enough to motivate teachers to attempt alternative teaching practices and to adopt those that work for their own practice.

School reform efforts in this district make collaboration time available to teachers and it is an article in their contract that offers continuing learning experience that affects what they do in their classrooms and is teacher directed. This collaborative inquiry model was authentic and had an effective implementation constructed by the teachers. Teachers shared their practice and worked together to build their practice. The inquiry model can be implemented into the collaboration time and can support teachers practice across content areas; it is not limited to math departments.

I plan to take the findings from this study to the district Secondary Math Subject Matter Committee. The group includes district middle school and high school math department chairs, the district instructional coaches, and a district administrator. Showing the power of Collaborative Inquiry to engage teachers in looking at their practice and offering peer feedback would benefit this group and offer them a focus back
into the classroom at their school site. I plan to present this study to the school board and district office administrators to show this inquiry model that is currently being used by a group of teachers in the district and to show how the model and teachers can better utilize teacher collaboration time in this school district. Offering all teachers this model to build their collaborative efforts is critical to effective use of time and to make the time meaningful to them to increase student achievement.

With dedicated teachers and a stable, trusting teaching environment, the phenomenon of teacher reflection on their practice, and the opportunity for Professional Learning Communities to develop and thrive is imminent. I will disseminate the findings from this study at local math conferences, research conferences, and administrator trainings.

**Implications for Future Research**

There are several areas for future research. One area is to study the use of students’ voice. In this study the students clearly articulated the instructional themes that emerged from the videos. Student’s views on instruction, their perception of teachers, and their work product should be more frequently elicited and considered. Students may not have all the answers to the ills that plague urban schools. This does not mean that they may not have ideas on improving schools on a variety of critical issues, including instructional strategies and engagement. Students have ideas and insights that could prove to be helpful to improving instruction in schools if adults were willing to listen (Noguera, 2007). Students should be included in discussions about their school experiences. The conversations can occur in a variety of settings including focus groups, committees and
school site leadership teams, and informally in classrooms. It is imperative that these conversations include traditionally marginalized students, successful students, and students who are struggling.

As we move toward Common Core Standards and Assessments districts must recognize the role of the Algebra teacher and quickly begin to ensure that appropriate professional development is in place so that, “teachers can effectively teach the new math standards” (Williams, Haertel, Kirst, Rosin, & Perry, 2011, p. 63).

This study is not the final statement on the impact of collaborative inquiry as a vehicle to increasing achievement in Algebra for African American males but it does provide a promising starting point for continued study. Several insights and recommendations are offered in this study, but our “thirst for knowledge remains unquenched”. We will continue to study how to best serve African American males until the achievement gap is closed.
REFERENCES


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http://www.edsource.org/pub11-middle-grades-math.html


## APPENDIX A

### Effective Teaching Strategies

<table>
<thead>
<tr>
<th>Student Voice</th>
<th>Young</th>
<th>Hart</th>
<th>Garza</th>
<th>Smith</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“Mr. Young already has it down right now”</td>
<td>“She is new, she is like an elementary teacher so she is not use to teaching, this is why Mr. Young is giving her instructions on how to deal with the kids.”</td>
<td>“Kids keep asking what, how do you do that?”</td>
<td>“Kind of fun some days, we do partner work some days, we make Algebra posters, like we look in our textbooks, copy it down, then he puts it on the wall, if you don’t know something you can look at the posters, we use drumming and rhyming to review for tests,”</td>
</tr>
<tr>
<td></td>
<td>“Have the other teachers watch Mr. Young”</td>
<td>“She goes too fast over the Algebra, she goes over more stuff, when I ask questions, she tells me we are running out of time, by the end of the period, I forget my questions.”</td>
<td>“When the answer is right there, pacing gets slower, and I start to drift off”</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Video Lesson Topic</th>
<th>Mixture Problems</th>
<th>Rate and Distance</th>
<th>Exponents</th>
<th>Solving Equations Test Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video Lesson Instructional Strategies</td>
<td>Technology and visuals</td>
<td>Visuals and Maps</td>
<td>Rhythm and Repetition</td>
<td>Drumming and Pair Share</td>
</tr>
<tr>
<td>Engagement definitions from Interview</td>
<td>Students need to be thinking about material being presented to them cognitively activated</td>
<td>Thinking about the concepts we are covering, understanding of whatever it is</td>
<td>Students should be active in their learning, generating ideas, I should be able to see them thinking</td>
<td>Deep understanding every time we review it, critical understanding</td>
</tr>
</tbody>
</table>

### Effective Instructional Strategies:

The participating teachers self implemented instructional strategies that would increase student engagement in the Algebra lessons. After viewing the lessons and participating in the debrief sessions the participants were equipped to replicate the strategy into their own practice. The participants were honest in feedback and reflective during the debrief sessions.
### APPENDIX B

**The Collaborative Inquiry Model**

<table>
<thead>
<tr>
<th></th>
<th>Young</th>
<th>Hart</th>
<th>Garza</th>
<th>Smith</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Debrief self feedback</strong></td>
<td>That lesson is like the best lesson I have all year, I got the materials and I’ve got the thinking I use choral response but didn’t get enough engagement</td>
<td>I talk to fast It is hard to understand me</td>
<td>Some will say, oh, it’ childish in terms of age appropriate strategies I want to provide access for them</td>
<td>Process itself caused me to reflect more on my own instruction/practice, learning from the others, I should be doing this better</td>
</tr>
<tr>
<td><strong>Debrief peer feedback</strong></td>
<td>Used the visuals, the juice, and technology Pair share Try it, if we are nervous we sabotage the trial of the strategy, try it with different classes, a totally unique experience</td>
<td>Used the technology, visuals and maps This was definitely solid lesson, solid for sure, better than when I was teaching it What I did was mediocre compared to your lesson Wait time</td>
<td>Used Tapping and repletion of exponent power as re-engagement tool not as a method to teach exponents They are not ready for just memorizing new rules; they’re ready for let’s practice and see what this looks like</td>
<td>Used Drumming and rhyme to memorize steps Pair share Too long on one problem, hard to follow the math</td>
</tr>
<tr>
<td><strong>Interview</strong></td>
<td>Insightful for myself I gained about their teaching practice and my teaching practice, what they thought was informative, what they thought was not informative,</td>
<td>It gave me different ideas for changing up my own lessons and how other people are getting students engaged gave me a lot of different ideas and techniques for teaching different concepts</td>
<td>It gave me to share ideas with my colleagues, get their opinion on what I am doing</td>
<td>Visual aids caused me personally to think of the problems differently, deepened my understanding and my understanding of students</td>
</tr>
</tbody>
</table>

**Collaboration Methodology:** The teachers used a collaboration model that included videotaping lessons being taught, viewing their videos as a team and offering peer feedback. As a result teachers gained insight into effective strategies that engaged student’s participation and thinking. The rewards of this model included increased trust between the participants, offered perspective of the participants about the pace of the instruction, gave feedback on instruction, built teacher leadership and capacity to replicate this model.
into other departments and a renewed focus on the achievement of their African American male Algebra students.
### APPENDIX C

**Survey Tool Table**

<table>
<thead>
<tr>
<th>Score</th>
<th>Culturally Relevant Instruction</th>
<th>Young</th>
<th>Hart</th>
<th>Garza</th>
<th>Smith</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Difficult to make Algebra culturally relevant to any person, I attempt to integrate the interesting applications into my lesson</td>
<td>3</td>
<td>Don’t really know what to do to target specific nationality, tend to tailor to students in general</td>
<td>3</td>
<td>Actively/consciously seeking approaches methods to provide culturally relevant instruction to my African American males</td>
</tr>
<tr>
<td>3</td>
<td>It gives me a clear time limit on each lesson and keeps the lessons focused</td>
<td>3</td>
<td>It helps me stay on track but also feels like a burden to keep up at times</td>
<td>3</td>
<td>It directs my approach, I follow the pace and assign the homework</td>
</tr>
<tr>
<td>4</td>
<td>98% of students can if they donate the proper amount of time to learning the subject, an hour and a half each day and they will be able to succeed</td>
<td>4</td>
<td>I believe any student can, sometimes it’s hard when they lack remedial skills and motivation</td>
<td>5</td>
<td>Assuming that the African American male has had consistent, appropriate math experiences, then they should be prepared, many social and systemic shortcomings contribute to their failure—without explanation is offered</td>
</tr>
</tbody>
</table>

**The Survey:** The participants self reported on a written Lickert scaled survey their beliefs about culturally responsive teaching, the pacing guide and beliefs in African American males in Algebra. The participants replied that they use the pacing guide. Two of them found the pacing to be a concern, both responding that the pace is fast. All of the participants agreed that African American male students are capable to complete Algebra in 8th grade. Responses to offering culturally responsive instruction varied from not being comfortable to being extremely comfortable.
APPENDIX D

Teacher Interview Questions

Tool to bring closure to the video debriefs and develop questions for the student focus group

Interview Questions: teacher participants after watching and debriefing the videos and collaborating during the first quarter of the school year 2011-2012

1. How was this collaboration experience for you? Feelings?
2. How did the collaboration impact your instruction?
3. How have your beliefs about your African American students achieving in your Algebra classes impacted your instruction?
4. How did the collaboration impact your instruction for African American male students in your classes?
5. How did the engagement strategies we discussed during the video debrief sessions transfer into your practice? ---Relevance-Rhythm-Signals-Student Talk Time
6. If you could ask your African American students a question, what would it be?
7. What are our next steps in department collaboration?
APPENDIX E

Student Interview Questions

Tool to capture the voices of African American male students enrolled in Algebra 1 courses.

Interview Questions: The students were questioned by the researcher in a group focus group.

- Tell me about your Algebra class?
- What teaching strategies are used to keep you going?
- What is your evidence that your teacher cares about the students in that class?
- What are the barriers to your learning?
- If you had to tell your math teachers anything about instruction, what would you like to tell the teachers to do differently?
APPENDIX F

Participation Letter

**Title of Study:** *Algebra is a Civil Right: Instructional Coaching as Professional Development to increase achievement in Algebra for African American Males*

**Principal investigator:** Lisa Davies Gomez

**Address:** 4817 Scotia Street, Union City, CA 94587

**Email:** Educatingldd@aol.com

**Phone Number:** (510)755-3554

**Institutional Review Board**
California State University East Bay
25800 Carlos Bee Boulevard
Hayward, CA 94542
(510) 885-3605

**Description of Study:** Lisa Davies is a doctoral student at California State University East Bay engaged in research for the purpose of satisfying a requirement for a Doctor of Education degree. The purpose of this study is to research the impact of instructional coaching on teacher practice. The intent is to measure perceptions and practice of teachers and instructional coaches on their experiences with coaching that increase achievement for African American males in a middle school setting.

If you agree to participate, you will be interviewed with a battery of questions and asked to complete the attached questionnaire. This questionnaire will help the writer identify the perceptions of teachers. The data from this questionnaire will be used to identify the impact of the instructional coaching on practice.

**Risks/Benefits to the Participant:** There may be minimal risk involved in participating in this study. There are no direct benefits to for agreeing to be in this study. Please understand that although you may not benefit directly from participation in this study, you have the opportunity to enhance knowledge necessary to select and pair mentors to beginning teachers and also the type of training needed by veteran teachers in order to meet the needs of beginning teachers. If you have any concerns about the risks/benefits of participating in this study, you can contact the investigators and/or the university’s human research oversight board (the Institutional Review Board or IRB) at the numbers listed above.
APPENDIX F

Participation Letter

Cost and Payments to the Participant: There is no cost for participation in this study. Participation is completely voluntary and no payment will be provided.

Confidentiality: Information obtained in this study is strictly confidential unless disclosure is required by law. All data will be secured in a locked filing cabinet. Your name will not be used in the reporting of information in publications or conference presentations.

Participant’s Right to Withdraw from the Study: You have the right to refuse to participate in this study and the right to withdraw from the study at any time without penalty.

I have read this letter and I fully understand the contents of this document and voluntarily consent to participate in the research. All of my questions concerning this research have been answered. If I have any questions in the future about this study they will be answered by the investigator listed above or his/her staff.

I understand that the completion of this interview or questionnaire implies my consent to participate in this study.

Participants Signature: ________________________________ Date: _______________
APPENDIX G

Dissertation Research Permission Letter

August 2, 2011

To: Leticia Salinas

From: Lisa Davies

Re: Dissertation Research Permission

I am a doctoral candidate at California State University East Bay and a Principal at ZZZ Middle School. I am requesting permission to conduct a study at ZZZ Middle School regarding the instructional coaching as professional development of educators. I have chosen this particular district and middle school because they have participated in professional development using the coaching model for many years.

I have spent the last two months preparing for approval from California State University East Bay Institutional Review Board and making arrangements with my dissertation committee, Dr. Debbie Bradshaw, Dr. George Gagnon and Dr. Peg Winkelman (chair) to collect data on instructional coaching as professional development in this district middle school. No students will be involved in the study, no coercion will be used to get teachers to participate, teachers will be invited and may disregard the questionnaire if they so choose not to participate. I have completed the Institutional Review Board components and await the final approval for a September start to this study.

If you have any questions, please feel free to e-mail me at this address or you may call me at (510) 755-3554. I truly hope you will see everything is in order and will be able to approve my study in this district.

Thank you very much for your time and support in my endeavors.

Lisa Davies
APPENDIX G

Dissertation Research Permission Letter

Algebra is a Civil Right:
Instructional Coaching as Professional Development to increase achievement in Algebra for African American Males

The purpose of the study is to explore Instructional Coaching as Professional Development to increase achievement in Algebra for African American Males in this district. The district or school name will not appear anywhere in the dissertation, nor will the names of any of the participants. I will use a beginning of the school year questionnaire to assess the teacher’s beliefs and opinions on coaching and instructional practices. I will observe best teaching practices in the classrooms and will conduct one on one interview with the Algebra teachers and coaches at the beginning of the school year in September and again at the end of the first quarter. The findings from the study will be shared with district leaders in an effort to support Algebra instruction in middle school classrooms across the district in an effort to increase achievement for African American Males in mathematics, thus closing the achievement gap and increasing their future learning and earning opportunities.
APPENDIX H

Dissertation Research Questionnaire/Survey

Questionnaire/Survey

*Algebra is a Civil Right: Instructional Coaching as Professional Development to increase achievement in Algebra for African American Males*

Ethnicity – Are you:

- American Indian or Alaskan Native
- Asian
- Black or African-American
- Hispanic or Latino
- Native Hawaiian or Other Pacific Islander
- White
- Other: ________________________________
- Choose not to respond

What is the highest degree you have obtained?

- BA/BS
- MA/MS/MEd.
- Ed.D/Ph.D

In what area of study did you obtain your degree?

__________________________________________

Are you certified by the state of California to teach mathematics?

- Yes
- No
APPENDIX H

Dissertation Research Questionnaire/Survey

**How much professional development in the area of mathematics** have you received this year?
- Number of hours? __________
- Number of courses? __________

**How many total years have you been in education?** ______

**How many total years have you taught mathematics** prior to this school year? ______

**How many years have you taught Algebra?** ______

**At how many other schools/ institutions have you taught Algebra?** __________

The next questions focus directly on the use of the adopted *Algebra Program*.

**How often did you use the instructional Algebra materials from the program?**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>Daily</td>
<td>Weekly</td>
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If you did not use the materials, what barriers exist for you?

**How often did you use the pacing guides for the program?**

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<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>Daily</td>
<td>Weekly</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dissertation Research Questionnaire/Survey

If you used the pacing guide, how did the pacing guide support your instruction?

---

How often did you use the assessments from the program?  
1. Never  
2. Daily  
3. Weekly

If you used the assessments, how well did they support you in assessing student learning?

---

How often did you use the technology components?  
1. Never  
2. Daily  
3. Weekly

If you used the technology, what components supported your instruction the most?
APPENDIX H

Dissertation Research Questionnaire/Survey

How do you rate the organization of the instructional coaching?

1 2 3 4 5

Poor Excellent

How do you rate the instructional coaching support for African American male, Algebra/mathematics language development?

1 2 3 4 5

Poor Excellent

How do you rate the direct coaching for African American male’s engagement in Algebra?

1 2 3 4 5

Poor Excellent

How do you rate the Algebra coaching support/modeling for African American males?

1 2 3 4 5

Poor Excellent

How do you rate the overall quality of your assigned math program with the influence of the coaching?

1 2 3 4 5

Poor Excellent
APPENDIX H

Dissertation Research Questionnaire/Survey

Questions about Standards Based Instruction

How comfortable are you with the district academic standards for Algebra?

1 2 3 4 5
Not at all comfortable Extremely Comfortable

How comfortable are you with the districts expectations for Algebra success in middle school?

1 2 3 4 5
Not at all comfortable Extremely Comfortable

What is your comfort level of standards based Algebra instruction?

1 2 3 4 5
Not comfortable Extremely Comfortable

What is your comfort level of providing culturally relevant instruction in Algebra for African American males?

1 2 3 4 5
Not comfortable Extremely Comfortable

Teacher Belief Questions

Do you believe African American male students in the district can complete Algebra by 8th grade?

1 2 3 4 5
Fully disagree Somewhat disagree Fully Agree
APPENDIX H

Dissertation Research Questionnaire/Survey

How consistent is the Algebra program (scripting and assessments) with your own beliefs about math instruction?

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<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fully disagree</td>
<td>Somewhat disagree</td>
<td>Fully Agree</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Explain your thoughts...

Explain your thoughts...
APPENDIX H

Dissertation Research Questionnaire/Survey

Do you have any additional information or comments you would like to share about Algebra instruction or the Algebra coaching?

Area for sharing your thoughts/experiences...

Thank you for taking time to complete this questionnaire!