

ABSTRACT

MUHAMMAD, RHONDA K. Investigating Instructional Practices of an African American Male Mathematics Teacher with Underachieving African American Male Students. (Under the direction of Dr. Paul Bitting).

This qualitative study examined the instructional practices of an experienced African American mathematics teacher to determine his perceived capabilities in augmenting academic proficiency for his African American male students. Provided in this descriptive case study are the lived experiences of an African American male teacher working to move his students along the continuum from underachievement to achievement.

Reform in mathematics education has established standards and principles that focus on equity in teaching and learning. Educational equity requires all students must have opportunities to study and learn from effective and knowledgeable teachers (National Council of Teachers of Mathematics, 2000). Investigating the instructional practices used for African American male students provided a unique opportunity to garner insights from an African American male teacher who is a segment of the teaching profession minimally represented.

Data obtained from classroom observations, interviews and document reviews provided a profile of the research participant, his content knowledge and his sense of teacher-efficacy. The investigation of his instructional strategies and his perceived capabilities provides insights for educators who work in the content area of mathematics, particularly with underperforming African American male students.

Working to build foundational knowledge for underrepresented African American males taking higher level mathematics courses such as Pre-Algebra and Algebra I in middle

school involved more than academic achievement. It also encompassed attitude adjustment during the critical period of identity formation for young adolescents.

Several of the instructional strategies emerging from this study had implications for teacher-student relationships, implementation of equity and teaching principles, intersection of race and gender, and high teacher efficacy. The instructional strategies utilized by this African American male mathematics teacher are worthy of consideration for teachers, school administrators and colleges of education.

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Investigating Instructional Practices of an African American Male Mathematics Teacher with
Underachieving African American Male Students

by
Rhonda K. Muhammad

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APPROVED BY:

Dr. Paul Bitting
Committee Chair

Dr. Robert Serow

Dr. Bonnie Fusarelli

Dr. Kenneth Brinson, Jnr.

DEDICATION

To my father, the late Kenneth Bernard Murray-Muhammad, who was the prime example of African American manhood in my life. His loving and genuine care for people has shaped who I am, and I pray his spirit lives on within me. To the Creator of the Universe and all systems of Knowledge, I am indeed grateful for Your guidance and mercy. To my wonderful husband, Oliver Muhammad, who suggested I take this path and has been with me every step of the way. Special thanks to Dr. Paul Bitting, Dr. Robert Serow, Dr. Bonnie Fusarelli, and Dr. Kenneth Brinson for their assistance in this arduous process. To my aspiring adult sons, Salahuddin and Umar , who are the inspiration for this research study. And to my grandsons Elijah and Siddeeq, I pray your educational journey is enriched by those who ignite your love for self and learning.

BIOGRAPHY

Rhonda K. Muhammad is an Educational Consultant with the North Carolina Department of Public Instruction in Raleigh, North Carolina. She is pursuing a Ph.D. in Educational Leadership and Policy Analysis. Born in Baltimore, Maryland, and raised in Raleigh, she was educated in the public school system. She has a Bachelor's of Science and a Master's degree in Family and Consumer Science from North Carolina Central University in Durham, North Carolina.

As a veteran educator of thirty-six years, she has worked in several educational venues including public, private, charter schools, community college and a four year institution. She is committed to promoting quality teaching and learning for all students.

Her professional career has included that of middle and high school teacher, charter school director, early childhood specialist, nutrition and wellness presenter, and parent involvement advocate especially for underrepresented students who are placed at-risk. During the past seven years, she has worked closely at the state and district level in the area of school reform under the Elementary and Secondary Education Act (ESEA). As state coordinator for rural low-income schools, she also provides oversight and technical assistance for education resources under the Rural Education Achievement Program (REAP) in many of North Carolina's rural districts.

She includes travel as educational opportunities that broaden one's world view and has traveled to Europe and northern Africa. She plans to resume traveling and continue writing and publishing.

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*In honor of my mother Margaret Rose Murray, and my siblings Kenneth Jr. and Isaiah
Murray.*

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*To my scholarly Aunts and Uncles who provided the family with a legacy of educational
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Chapter 1: Introduction

The question of education for Black people in America is a question of life or death. It is a political question, a question of power... Struggle is a form of education, perhaps the highest form (Lerone Bennett, 1972).

This qualitative research study explored the instructional practices of an experienced African American male mathematics teacher who teaches a diverse student population. He has been especially successful with African American male students in the middle school making adequate yearly progress (AYP) after previously being unsuccessful achieving AYP. More specifically, the study examined what the study participant perceived as successful strategies moving his African American male students along the continuum of underachievement to proficiency in mathematics. The educational experiences of many African Americans and other students of color have created what is often referenced as the “achievement gap”(Commission on Raising Achievement and Closing Gaps, 2004). The *achievement gap* is defined as a “persistent, pervasive and significant disparity in educational achievement and attainment among some students as determined by a standardized measure. When analyzed according to race and ethnicity, achievement disparities negatively impact educational opportunities for poor children and children of color on a consistent basis (Commission on Raising Achievement and Closing Gaps, 2004). However, as noted by Jerald (2007), “achievement gains are significantly higher in schools where teachers take collective responsibility for students’ academic success or failure rather than blaming students for their failure” (p. 2). The focus of this study investigated the perception this

African American male teacher has regarding his work with underachieving middle-school students, particularly his African American male students.

Theoretical Framework

The theoretical framework for this study is grounded in the work of Bandura's (1977, 1986) theory of self-efficacy. In his *Social Foundations of Thought and Action*, Bandura (1986) theorized that individuals possess "a self-system that enables them to exercise a measure of control over their thoughts, feelings and actions" (Pajares, 1996, p. 543). Pajares (1996) further explained that "self-efficacy also plays a prominent role in providing reference mechanisms and a set of subfunctions for perceiving, regulating, and evaluating behavior, which results from the interplay between the self system and the external- environmental sources of influence". In all, Bandura (1977, 1986) painted a portrait of human behavior and motivation in which the beliefs that people have about themselves are key in the exercise of control and personal agency. Bandura also considered self-reflection the most uniquely human capability for through this form of self-referent thought people evaluate and alter their own thinking and behavior. These self-evaluations include perceptions of self-efficacy or "beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations" (Bandura, 1986, p. 544). Thus, an understanding of the theoretical lens the research study is framed allows the inquiry to be analyzed within a set of parameters connecting to the existing body of knowledge. According to Pajares (1996),

Efficacy beliefs help determine how much people will expend on an activity, how long they will persevere when confronting obstacles, and how resilient they will

prove in the face of adverse situations—the higher the sense of efficacy, the greater the effort, persistence and resilience. Efficacy beliefs also influence individuals' thought patterns and emotional reactions. People with low self-efficacy may believe that things are tougher than they really are, a belief that fosters stress, depression, and a narrow vision how best to solve a problem. High self-efficacy on the other hand, helps to create feelings of serenity in approaching difficult tasks and activities. As a result of these influences, self-efficacy beliefs are strong determinants and predictors of the level of accomplishment that individuals finally attain. (pp. 544-545)

By using the belief systems ascribed to self-efficacy, one can make the link to teacher efficacy as an important construct in teacher education and in instructional practice.

Teacher efficacy. Several decades ago the notion of teacher efficacy emerged as a construct worth considering. Grounded in the theory of self-efficacy, contemporary researchers proposed the concept of teacher efficacy within the educational setting as the beliefs teachers have about their own skills and abilities to create desirable outcomes for students (Ashton & Webb, 1986; Gibson & Dembo, 1984). Although described as simplistic teacher efficacy has significant implications referring to “the extent to which a teacher feels capable to help students learn, can affect teachers’ instructional efforts in areas such as choice of activities, level of effort, and persistence with students” (Tschannen-Moran & Hoy, 2001, p. 791). In addition, “teachers exert a potent influence over the achievement of all students, low-income culturally diverse students in particular and specifically African American students” (Tucker et al., 2005, p. 29).

Those who have a high sense of efficacy about their teaching abilities can motivate their students and enhance their cognitive development. However, Tucker et al.(2005) reported that in a study conducted in the late 1990s “teachers with low efficacy considered general education placement inappropriate for the underachieving students from lower socioeconomic families” (p. 30). Such consideration may offer insights into the disparities in academic performance between Caucasian and African American students.

As reported by Hoy and Davis (2006), a “teacher’s sense of efficacy is a judgment about capabilities to influence student engagement and learning, even among those students who may be difficult or unmotivated” (p. 117). Throughout most school districts in America, the growing diversity rate in student population is steadily increasing. Both new and experienced teachers are faced with the arduous task of offering instruction in a learning environment that may or may not resemble the student population teachers were prepared to teach. According to Soodak and Podell (2001), national research reports and teachers’ reflections suggest that

Teachers’ struggle to accommodate students with diverse needs is also compounded by increase class sizes, the lack of academic and emotional support services, and the inability to override the effects of poor social conditions that many children experience outside of school. (p. 44)

External factors such as the home environment or the family’s socioeconomic status may often extend beyond the teacher’s realm of influence. However, teachers’ content

knowledge, their instructional practices and their beliefs about their students' ability do influences student achievement.

Berry (2002) cited several factors affecting the underachievement of African American students in mathematics. Included as variances in achievement are "tracking policies, access to high level mathematics courses, instructional practices, availability of resources, teachers' beliefs about students, and students' attitudes and beliefs about mathematics and their mathematical abilities" (p. 17). As a result of this qualitative study, the variances in achievement were determined as instructional practices, access to high level mathematic courses and teachers' beliefs were investigated. At a time when teacher recruitment and retention are integrated into reform efforts of school improvement, the investigation of a veteran teacher's approach to working with underachieving African American male students offers insights from a unique perspective, that of an African American male teacher himself. Thus, teacher content knowledge and instructional skill level can play an important role in enhancing student learning and achievement. Moreover, the perception teachers have of their ability to teach and facilitate learning for their students, particularly struggling students, can serve to enhance the retention of quality teachers.

There are two dimensions that have been identified working within the construct of teacher efficacy: one is personal teaching efficacy, that is the teacher's belief in their ability to affect change in their students, and the other is general teaching efficacy, or the teacher's beliefs regarding the extent to which he or she believes teaching can overcome external influences on student outcomes (Ashton & Webb, 1986; Gibson & Dembo, 1984; Tucker et

al., 2005). This study focused on personal teaching efficacy to investigate what influence low-performing students may have on teacher's beliefs as an experienced mathematics teacher. Research on teacher efficacy reports that teachers' beliefs of personal efficacy affects their instructional activities, determines their orientation toward the educational process, and also predicts student achievement and students' achievement beliefs across various areas and levels (Tschannen-Moran & Hoy, 2001). Ware and Kitsanis (2007) added that "if teachers are self-efficacious, they will be more likely to plan appropriate activities, persist with students who are having difficulties, and probably remain committed to their work" (p. 303). Given the shift in demographics over the past decade and the need to recruit and retain highly effective as well as highly qualified teachers, provides insights for teacher educators and policy makers.

A descriptive case study served as the primary methodology for this research. This methodology provided an opportunity for rich and in-depth exploration of this African American male teacher's beliefs and of his ability to influence student mastery of middle-school mathematics concepts. Data collection methods included classroom observations, teacher interviews, examples of students' work and learning plans, teacher lesson plans, and teacher evaluation.

Background of the Study

For some people, the image of the African American male conjures up multiple negative perceptions that cover the spectrum of crime, unemployment, morbidity, homicide, incarceration, and poor health. According to Noguera (2005):

All of the quality-of-life indicators suggest that African American males are in deep trouble. Beset with an ominous array of social and economic hardships, it is hardly surprising that the experience of African American males in education, with respect to attainment and most indicators of academic performance, also show signs of trouble and distress. (p. 17)

The socioeconomic status of students has often been attributed to academic gains and losses for some African American students. However, according to Noguera (2003), “even class privilege and the material benefits that accompany it fail to inoculate African American males from low performance” (p. 18).

In its Mathematics 2009 report on annual assessments, the National Assessment of Education Progress (NAEP) asserted that “improvement in mathematics performance in Grade 8 was evident and the national average for eighth graders was higher in 2009 than in all previous assessment years”(p. 22). However, the achievement gap of 32 points persisted between African American students and their Caucasian counterparts.

Accountability, as measured by AYP in most public schools, suggests that some subgroups are meeting academic targets and some are not. Most often African American males are among those who do not meet standards, and a disproportionate number of African American students are served in special education programs in schools (Cartledge & Dukes, 2009). During the 1998-1999 school year, the U. S. Department of Education reported that “approximately 50% of all students who were labeled as mentally retarded, 40% who were identified as developmentally delayed, or the 37% who were classified as emotionally

disturbed were African American and Latino” (Howard, 2003, p. 196). Currently, reform efforts are needed to bring balance to the disproportionate number of African American students identified for special education. Harry and Klingner (2006) reported that in every area of disability, African American students are represented with higher incidence. As Harry and Klinger said:

We argue that the process of determining children’s eligibility for special education is anything but science. Rather, it is the result of social forces that intertwine to construct an identity of ‘disability’ for children whom the regular-education system finds too difficult to serve. (p. 9)

This notion may lend itself to subjectivity in the identification process and require closer study in future research.

Statement of the Problem

As reported by Fashola (2005), “The crisis of African American males lack of educational achievement has become such an important topic that in the year 2000, the U. S. Department of Education had cause to sponsor a conference specifically dedicated to the topic” (p. ix). Such studies would not be the first or only such undertaking delving into the issues facing African American male students, but would serve as the catalyst for subsequent studies held throughout the country. Another example of a study focusing on teaching

African American students and the urgency for reform is the report by Holzman (2004) in the *Public Education and Black Male Students: A State Report Card*. Holzman found:

In many school districts, up to 70 percent of black boys who enter 9th grade do not graduate four years later with their peers. In most districts, black boys are disproportionately assigned to special education and nearly absent from advanced placement classes. (p. 2)

Nationally, state governors, educational organizations, and faith-based initiatives have also taken the lead in creating public awareness regarding education and other social issues that impact the quality of life for African American males by holding annual conferences and summits.

The existing literature regarding education of African American males is often characterized by reports and data that document the problem rather than provide strategies for addressing the issues of underachievement. The intent of this research was to explore what responsibility the educator assumed to address narrowing the achievement gap for African American males in the subject area of mathematics.

Significance of the Study

Students with a strong foundation in mathematics are typically more successful in secondary and postsecondary education. According to the findings in the National Mathematics Advisory Panel Final Report 2008:

Success in mathematics education also is important for individual citizens because it gives them college and career options, and it increases prospects for future income. A

strong grounding in high school mathematics through Algebra II or higher, correlates powerfully with access to college, graduation from college, and earning in the top percentile of income from employment. The value of such preparation promises to be greater in the future. (p. xii)

Mathematic scholars (Smith, Stiff & Petree, 2000) concur and offer that changes in mathematics requirements for high school graduation and entrance into college, in the technological demands of an expanding number of careers, and in the applications of everyday living require that all students begin their mathematical preparation as early as possible and continue it for as long as possible (p. 89).

Likewise, effective mathematics instruction has been shown to influence student achievement. According to Mujis and Reynolds (2002), “Studies using large databases and multilevel modeling techniques have consistently found that teacher effectiveness influences students’ achievement, and is one of the main influences on student progress over time” (p. 3).

This research study explored the instructional practices that can be used to help African American males achieve academic success. Unique to this study was the perspective provided by a voice that is infrequently heard in public education today due to the scarcity of African American male teachers in the profession. Although teacher self-efficacy has been linked to student learning, and there are existing mathematics student self-efficacy studies (Pajares, 1996), there is a void in teacher-efficacy data in mathematics education.

Mathematics education has undergone significant reform efforts over the past 2 decades. In 1985, the Mid-Atlantic Equity Center published *Mathematics and Science: Critical Filters for the Future*, addressing in part mathematics education, school leadership, and academic opportunity for traditionally underserved students (Tate & Rousseau, 2007). A review of research and policy in mathematics education pointed to three significant changes: (a) the introduction of national mathematics standards (National Council for Teaching Principles Mathematics, 2000); (b) mandates for educational leadership to address issues of learning and teaching in the schools, and (c) implementation of Title I accountability systems in all public schools (NCLB, 2001). In response to criticism that the mathematics education community has failed to articulate adequately how access and opportunity to learn mathematics can be expanded to traditionally underserved students, the National Council for Teaching Principles Mathematics (NCTM, 2005) has called for a focus on equity in its *Principles and Standards for School Mathematics*. This study has attempted to address these issues by contributing to the existing body of knowledge related to teacher-efficacy in mathematics.

Purpose of the Study

The purpose of this research study was to examine perceptions held by an experienced African American male mathematics teacher who works with a diverse population of middle-school students and to determine what he values as it relates to his instructional practices working with African American male students. The following

research questions guide the exploration of the participant's perception and belief system as it relates to teacher responsibility and accountability:

- 1) What are the instructional practices of an experienced African American male mathematics teacher?
- 2) What does he perceive as his capabilities in augmenting academic proficiency for his African American male students?

By answering these two research questions, the researcher has sought to capture authentic experiences informed by the data collected and analyzed in the study.

Research Study Definitions

Instructional practice. Defined in this study as those strategies used by the teacher on a consistent basis to teach, engage students, manage classroom behavior and support student learning.

Underachieving African American male students. Defined in this study as those African American male students (American of African descent) who perform below average (75%) in their middle-school mathematics classes (Grades 6, 7, 8) and who score either Level I or II on the End-of-Grade summative state examination at the end of the academic calendar year.

Overview of Methodology

As suggested by Hoy and Davis (2006), "Teachers' sense of efficacy is a judgment about capabilities to influence student engagement and learning, even among those students who may be difficult or unmotivated" (p. 117). Given the marginalized status of African

American students, particularly African American male students, an investigation into classroom teaching experiences of a mathematics teacher of African American males is the focus of this study. This qualitative research study method was a descriptive single-case study utilized to investigate what an experienced African American male mathematics teacher perceived as most significant in augmenting academic proficiency for his middle-school African American male students. Using the descriptive single case study method allowed the researcher entry into a contemporary educational setting in order to explore fully the instructional practices of an experienced teacher and to investigate his belief system related to his own teaching capabilities.

Overview of the Study

A review of the existing literature revealed that over the past three decades, teacher-efficacy, as it relates to positive learning and instructional outcomes, has become an important area of educational research. This study was conducted in a public school district in Wake County, North Carolina, that has experienced rapid and steady growth over the past decade. The instructional practices and perception of an African American male middle-school mathematics teacher in this district were captured in a descriptive case study.

Data collection and analysis were conducted using classroom observations, interviews, and document analysis. The following chapter provides the context for understanding teacher efficacy, education of African American male students and reform efforts in mathematics education.

Summary of the Chapter

This qualitative research study explored the instructional practices of an African American male middle-school mathematics teacher to determine his perception of his own teacher efficacy in working with underachieving African American male students. His thoughts and perceptions related to student proficiency were documented through data collection and analysis in the form of classroom observations, interviews, and document gathering. The study was conducted in Wake County, the largest school district in North Carolina, where ethnic diversity is rapidly growing with minimal diversity mirrored in the teaching staff. As an experienced African American male mathematics teacher in a middle school, his instructional practices with African American male students is worthy of study as preparation for success in secondary education and college.

Chapter 2: Literature Review

The purpose of this study was to explore the instructional practices of an experienced African American male mathematics teacher whose work with diverse students, particularly African American male students in a middle school, has warranted him the distinction of a highly effective mathematics teacher. The research questions framing this study were

- 1) What are the instructional practices of an experienced African American male mathematics teacher?
- 2) What does he perceive as his capabilities in augmenting academic proficiency for his African American male students?

The review of the literature in this chapter provides the background for understanding some of the pressing issues surrounding the education of African American males while also providing the contextual framework for teacher efficacy. The chapter focuses on three major content areas: (a) educating African American males; (b) teacher efficacy as a construct for effective teaching and learning; and (c) reform in mathematics education.

Since the 1980s, schools have attempted to respond to public protest from parents and others dissatisfied with the educational system that has been seen as failing to meet the needs of a growing diverse student population that is now part of the educational landscape. The increased interest in the education of African American males has spawned a sense of urgency that has gained the attention of policy makers, advocacy groups, and philanthropic organizations. Schott Foundation for Public Education (Holzman, 2004), the Children's Aid Society (Morgan & Bhola, 2006), and the Joint Center for Political and Economic Studies

(Dellums Commission, 2006) are counted among those most recently engaged in the work of addressing the issues regarding academic performance and achievement. Despite this attention and renewed interest in African American males, particularly those of school age, there are still overarching concerns about the sources of the problems undermining the educational and life changes of African American males (Davis, 2006). Consequently, the challenges, identity formation, and teaching and learning of African American males were part of this section.

The role of teachers and their sense of self-efficacy framed the context for understanding teacher efficacy as it relates to student outcomes. A major core of student learning is grounded in the work of teachers in the classroom. How teachers feel about their ability to teach and facilitate learning to their students, especially those students experiencing difficulty in the respective subject areas, was explored in this chapter.

Curricular reform efforts particularly in mathematics education offer direct correlates to meeting barriers faced in educating African American male students. By exploring the proposed principles and standards recommended by the governing boards and regulatory organizations for mathematics education, it is the intent of this researcher to provide the reader with background information to assess the breadth of the reform efforts underway.

Educating African American Males

Public education in America has undergone significant demographic shifts along with major reform efforts to address a broken system not meeting the needs of all its students. For African American students, the road to academic proficiency has historically been an arduous

one. The educational attainment of African Americans has been a struggle as they work to overcome the barriers of institutional racism and discrimination. Being an African American male often creates negative connotations and stereotypes that foster images that may create fear and anxiety for some in the broader society.

The educational experiences of African American students quite often include low expectations, a feeling of inferiority, and a sense of defeat in their academic pursuits (Cooper & Jordan, 2005). For some African American male students, the negative school experiences are even more telling. According to Berry (2002), his study of successful African American males in middle-school mathematics revealed the challenges faced by African American males were both social and academic:

African American males are frequently the victims of negative attitudes and lowered expectations from teachers, counselors, and administrators. The descriptive portraits of the eight African American middle school males in this study highlight the importance of teachers as influential in their lives, because of the decisions they make can either hinder or enhance the African American males' academic position. In many of the cases, the educators initially failed to recognize the academic potential of the African American males. This is significant because it raises concerns about other African American males whose academic potential are not recognized and relegated to being underserved in their educational experiences. (p. 141)

Berry (2002) also reported the issues of tracking and cultural dissonance as co-contributors to the achievement gap existing between African American and Caucasian students. The

participants in his study reported their success in mathematics was attributed to a mathematics teacher who understood their learning preferences and had high expectations of them.

Although socioeconomic status has been linked to student achievement, an achievement gap for both suburban and urban African American males exists. There is considerable confusion regarding why being Black and male causes this segment of the population to stand out in the most negative and alarming ways both in school and in society (Nogeura, 2005). Current research efforts to understand and address the issues of educating African American males must be rooted in both the problems as well as solutions.

The At-Risk Factor

The term “at-risk” has been used to indicate the propensity for negative outcomes as a result of social or economic standing in society. Even as babies, Black males have the highest probability of dying in the first year of life, and as they grow older, they face the unfortunate reality of being the only group in the United States experiencing a decline in life expectancy (Auerbach, Krimgold & Lefkowitz, 2000). For those children who grow up in poverty or impoverished conditions, the multiplier effect places them at risk of variables such as single-parent households, low birth weight, and low educational attainment of parents and others (Nogeura, 2005). Given the social and economic challenges, it is understandable that African American males’ academic performance often trails that of Caucasian American students’.

There are disproportionate numbers of African American children whose placement in remedial and special education classes limits their access to the full range of possibilities within a regular school curriculum. Those most likely to be placed in such programs are overwhelmingly Black, male, and poor (Harry & Klingner, 2000). Conversely, African American males are least likely to be placed in advanced placement or honors classes (Noguera, 2005). Issues of equity and access to opportunities are among the arguments proposed as barriers to academic achievement. According to the National Center for Education Statistics (2008), the average African American student was enrolled in a high poverty elementary or high school which was segregated, had fewer certified teachers, fewer up-to-date textbooks, and fewer advanced placement courses than their Caucasian counterpart.

The complexity of the challenges faced by African American males is further enhanced by the disparities in academic performance. When compared to their Caucasian American peers, even middle-class African American students lag significantly behind in both grade point average and on standardized tests (Ford & Moore, 2004). It appears that upward socioeconomic status does little to offset the low performance trends of this group.

Societal and cultural influences are pervasive risk factors contributing to underachievement of African American males. The role of education is crucial for moving marginalized groups along the continuum of achievement to that of productive citizens, and schools can serve as a primary conduit for that process to happen. According to Lee and Slaughter-Defoe (2001), a major aspect of the relationship between U.S. educational

institutions and African Americans has been the struggle over educational ideology and related policies and practices, including access and equity of resources available. Lee and Slaughter-Defoe (2001) attest that “Traditional learning environments, in which African Americans have participated in the greatest numbers, emphasized cultural assimilation, rather than cultural difference or competence, the latter two of which would affirm the African American cultural heritage” (p. 349). Hence, schools are often perceived as sites that provide limited support or the nurturing needed by those disenfranchised during critical periods of growth and development.

Even though today’s schools are more diverse, they engage in the intentional work of silencing disadvantaged culturally marginalized groups such as African American males, whose backgrounds can be very different (Davis, 2006, p.401). The shift in demographics or the redistricting of school districts can determine the degree of diversity while simultaneously determine local and state allocations for education in a district. Nembhard (2005) argues that in a postindustrial global economy, where most schools are likely to be segregated by race and class because of residential-housing patterns, students are implicitly disadvantaged by race and class based segregation—the lack of meaningful diversity.

For some African American males, the conflicting attitudes manifest themselves in self-defeating behaviors and misplaced values as it relates to academic achievement. Nogeura (2005) posits that acting out in class and avoiding challenging coursework make Black males complicit in their own failure in many ways. Ascribing cultural influences as a variable for poor academic performance is not held by some research scholars. Some

minority students, particularly non-English speaking students, may adopt the strategy of “accommodation without assimilation” or give up their own cultural beliefs and practices, to play the classroom game by the rules to avoid schooling difficulties (Ogbu & Gibson, 2001). Although negative stigmas and risk factors do not apply to all African American males, the body of research suggests that disproportionate numbers of underachieving students in that demographic gives cause for continued study. Thus, the structural and cultural forces interact and place many African American males at risk of achieving their full potential both in terms of their academic and future outcomes.

Identity and Masculinity

“What does it mean to be African American and male?” is a fundamental question aimed at understanding the dynamics at work for African American males in the school environment. To be male denotes specific attitudes quite unique and different from being female. Davis (2006) argues that there exists a battle between how African American males feel about school and how they feel about themselves; this battle is “waged in the classroom, hallways, and in the principal’s office as students attempt to remain authentic to who they are and who they perceive themselves to be” (p. 403). As a major institution of learning, the social constructs of the society are disseminated through the culture of schooling. Consequently, school provides the social setting for young people to engage with each other and begin to discern the implications of gender and racial differences. The structure and culture of school play a major role in reinforcing and maintaining racial categories based on perceived measures of ability (Nogeeura, 2005). Therefore, “when African American or

Latino students are overly represented in special education or remedial classes, or on the list for suspension or expulsion, the message conveyed is that these students are not as smart or well behaved is reinforced” (p. 63).

In the case of African American males, stereotypical roles in sports or entertainment are considered more suitable activities than academic endeavors such as participation in the Math Olympiad or on the school forensic team. Such activities are out of bounds because “Black males may perceive the activities as being inconsistent with whom they are and risk compromising their sense of self; or because there are not enough examples of individuals who participate for them to emulate” (Nogaura, 2005, p. 65). A discussion of gender as it relates to African American masculinity is crucial to understanding the role the school has in identity perceptions.

Generally, masculinity centers on the ways that males “perform” or act out their conceptions of what it means to be a man. According to Seidler (2006), the source of these definitions comes from the immediate social environments and those peers that serve as reinforcements with similar conceptions as well. The necessary behaviors for masculinity among some African American males may be construed as acting tough, fighting back when attacked, or being defiant to female instruction within the context of schooling. Masculinity and manhood are often used interchangeably, with few distinctions offered. Though the two terms are interconnected, they each express their own meaning and serve as the basis for further educational research yet needed.

Davis (2006) explains that “the interaction of school context, masculine identities and socialization is an untapped entry of intervention and are often minimized in research” (p. 403). However, in the school setting, the manifestation of how these conceptions are interpreted may run counter to established norms or protocols. By challenging a school climate that often excludes or labels them at risk, a distinctive culture and perception is being shaped by their gender position (Davis, 2001). African American males tend to behave in accordance with ideas that reflect who they are and how they want to be seen as African American males. The results are often exaggerated or represent a hyper-masculinity style that serves as a form of protest and defiance, which is already held by some teachers and peers (Ferguson, 2003). As argued by Ferguson , “To be sure, these students are well aware of their marginalized academic and social status by the time they enter middle school, and in turn, create their own rules for resisting and engaging school” (Ferguson, 2000, as quoted in Davis, 2006, p. 403). Unfortunately, this sense of self-agency works to perpetuate gender stereotypes and creates discord for those African American males who do not subscribe to culture of masculinity.

Tatum (2005) offers that the way teachers learn about identity construction might also include insight into the African American male identity development as well. Knowing diverse constructions of masculinity and how identity shapes the teaching and learning process for African American males is essential for teachers and other school personnel (Davis, 2006). Thus, what it means to be male and African American gets to the heart of the

matter in framing an understanding of the issues affecting African American males' underachievement.

Effective Teaching and Learning for African American Males

The process of schooling may be viewed simplistically as having two principal components—that of facilitating learning on the part of the teacher and that of learning on the part of the student. However, if educating America's children and youth were that straightforward, there would not be as much discourse surrounding public school reform issues as there currently exist. Irving (2009) posited that the “transformative power of teaching and learning occurs when students master the content materials and when teachers feel a sense of efficacy about their professional expertise” (p. 85). Both the teacher and the student learner have significant roles to play in the instructional process. Muijs and Reynolds (2001) reported that “studies using large databases and multilevel modeling techniques have consistently found that teacher effectiveness influences students' achievement, and is one of the main influences on student progress over time” (p. 3). In the case of African American students, Irvine (2009) documents the critical role that teachers play in their achievement. She acknowledged that “teachers not only influence the achievement and cognitive development of African American students, but they influence their self-concept and attitudes” (p. 85). Noguera (2005) explained that:

When working with African American students, an effective teacher is able to inspire students by getting to know them and can do a great deal to overcome anti-academic tendencies. When students trust that a teacher authentically sees them as important,

valuable, and intelligent people, they begin to respect and learn from that teacher regardless of his or her color. (p. 126)

Given gender, ethnicity, cognitive ability, and behavior ratings of students, the relationship with the teacher predicts aspects of success (Harme & Pianta, 2001). Both scholars Harme & Pianta (2001) conclude that the best teachers encourage good to excellent gains in achievement for all students, but lower achieving students are the first to benefit from good teaching. Thus, the influence of teachers on African American males academic and social well-being is too important for them to be absent from policy conversations and contributions (Lewis, 2006). Even though stereotypical images negatively inform teachers about African American males and may even create a sense of fear when interacting with them, for the most part, a cohesive teacher-student relationship is often the expectation of most African American males. When there is mutual understanding and respect on the part of the student and teacher, this bond can work to offset stereotypical beliefs that may exist and foster better understanding for African American males.

However, teachers face enormous challenges working with many students of various ethnic and racial backgrounds, thus producing what has been called the “demographic divide” (Milner, 2009). This divide can also be found within school districts where boundary lines are drawn and local school board decisions are made that reflect the return to segregated schools. Milner (2009) further advocates that the “push to prepare teachers for diversity is important; the push to prepare teachers for racial, ethnic, cultural, and socioeconomic awareness is, without question, also essential for teacher and P-12 student learning, growth

and improvement” (p. 128). To prepare new teachers adequately and support in-service teachers working in the schools throughout the America, there must be attention and consideration given to the shifting demographics.

The representation of cultural diversity in the classroom has a direct impact on instruction and student learning. Culturally relevant pedagogy is an attempt to address relevancy in instructional practices of teachers working with African American students. Social and educational researchers explain culturally relevant pedagogy as teaching that utilizes cultural knowledge, prior experiences, frames of reference, and performance styles of racially and ethnically diverse students to make learning encounters more relevant to and effective for them (Gay, 2000; Ladson-Billings, 2009). Several attributes are also ascribed to culturally relevant teaching (Gay, 2000):

1. It is validating by acknowledging the legitimacy of cultural heritages of different racial and ethnic groups, both as legacies that affect the dispositions, attitudes and approaches to learning and as worthy content to be taught in the formal curriculum.
2. It is multidimensional because it encompasses curriculum content, learning context, classroom climate, student-teacher relationships, instructional techniques and performance assessments.
3. It is empowering for both the student and the teacher who set high expectations and work to scaffold academic competence. (p. 78)

These components comprise the teaching and learning exchange in the education process. In addition to focusing on the academics, culturally relevant pedagogy is comprehensive and

includes more than cognitive experiences in subject matter or on standardized tests. It also includes social, personal and political aspects of development. Central to this kind of teaching is making authentic knowledge about different ethnic groups accessible for students. Thus, the culturally relevant teacher offers a mind-set for students to adapt to as they move forward to proficiency and mastery.

Encompassed within the teaching strategies for African American males is a need for refocusing and centering on the lives created and lived by these young men. Davis (2006) posited that awareness of these students' desires for authenticity about what it means to be a man creates potential segues to introduce relevant classroom and learning activities.

Understanding how African American males make sense of who they are in school and their relation to school culture of masculinity offers new points of entry for teachers. Having an African American male teacher who works with African American male students provides an added dimension to the research that is limited due to the scarcity of African American male teachers. Brown (2009) explained that although there has been considerable discourse on recruiting and increasing the presence of African American men in the schools, there has been limited attention given in the research literature (Lynn, 2002, 2006).

Fashola (2005) asserts that while it is true that school is an important site of critical, social, and cultural intervention, teachers need to be able to map where African American males are positioned. All too often the complex school life of African American males is overlooked or treated as unimportant. According to Davis (2006):

By broadening the realm of teaching and learning for African American males to include new images that link masculinity to the importance of schooling, academic achievement...the message conveyed would include that African American males can be men and also learn to love reading, writing and mathematics. (p. 406)

Educating the African American male also provides an opportunity to expand the concept of masculinity and identity formation. When African American males' gender and racial identity are taken into consideration in the classroom, Davis (2006) maintains that they enjoy increased academic achievement

Teacher Efficacy

Teacher efficacy is a construct that has developed out of the work of Albert Bandura (1977, 1994) who proposed the concept of self-efficacy. Self-efficacy is a theory of personal and collective agency that operates in concert with other socio-cognitive factors in regulating human well-being and attainment (Pajares, 1996). According to Bandura (1997), there are four sources from which self-efficacy beliefs are developed: (a) mastery experience—interpretive result of one's purposive performance, (b) vicarious experience—modeled by others, (c) verbal persuasion—received from others, and (d) physiological state—emotions experienced when contemplating an action (p. 4). Bandura (1986) also considered “self-reflection the most uniquely human capability, for through this form of self-referent thought people evaluate and alter their own thinking and behavior” (p. 544). The concept of teacher reflection has its roots in Dewey's (1933) philosophical ideas of education in which he advocated as a vital mental process.

According to Howard (2003), Dewey “viewed reflection as a special form of problem solving steeped in scaffolding of experiences and events that should be viewed as an active and deliberate cognitive process” (p. 197). Therefore, a natural progression along the continuum of teacher efficacy is to participate intentionally in reflective thinking of one’s own behaviors and actions related to teaching. Howard (2003) further promoted the concept of critical reflection, which views reflection from a moral, political and ethical framework of teaching. Addressing the issues of diversity in the classroom, especially with African American male students, will require “teachers to engage in honest, critical reflection that challenges them to see how their positionality influences their students in either positive or negative ways” (p. 197). When teachers participate in reflective thinking regarding their beliefs and instructional practices, they have embraced an important construct of teacher efficacy.

Within the education arena, teacher efficacy has emerged as a basis for teachers to determine their beliefs and capacity to perform their teaching responsibilities. Such implications are worth noting especially when working with diverse or underachieving students. Tucker et al. (2005) summarize the impact of teacher efficacy on culturally diverse students and report that although the literature supports that teachers have a powerful impact on low-income students, particularly African American students, teacher expectations have been shown to decrease for the culturally diverse students.

Teacher efficacy has also been defined within the context of subject matter “where a teacher may feel very competent in an area of study or when working with one kind of

student and feel less able in other subject areas or with different students” (Tschannen-Moran & Hoy, 2001, p. 784). The researchers also reported that in the area of science, teacher efficacy was related to the teacher’s experiences taking science courses with laboratory experiences and to experiences teaching science (p. 790). Studies on subject knowledge in mathematics as reported by Muijs and Reynolds (2002) concurred with those found in science—“that teachers’ mathematical knowledge is linked to both teacher behavior in the classroom and to student outcomes” (p. 5).

Several definitions frame what is captured when referring to this construct. Ross and Bruce (2007) contend that “teacher efficacy is a teacher’s expectation that he or she will be able to bring about student learning” (p. 50). Both researchers advocate that teacher efficacy is a “self-perception,” rather than a quantitative measure of teacher effectiveness. The earlier studies conducted to measure teacher efficacy (Goddard, Hoy, and Woolfolk-Hoy, 2004), however, reported that those teachers who were more efficacious impacted student achievement more than those teachers who were less efficacious. In determining the effects of professional development on teacher efficacy in the subject area of mathematics, Ross and Bruce (2007) found that professional development can strengthen “teachers’ self-assessment in concert with information on innovative instruction, [and] heighten teacher efficacy, which influences teacher goal setting and effort expenditure”(p. 52).

Teachers’ sense of efficacy is a judgment about their capabilities to influence student engagement and learning, even among those students who may be difficult or unmotivated (Woolfolk-Hoy & Davis, 2006). Teachers who work with students who are perceived as

difficult learners as well as those from diverse ethnic and racial backgrounds provide the context for considering efficacy judgments in many public schools today. Howard (2003) explains that “teachers need to understand that racially diverse students frequently bring cultural capital to the classroom that is sometimes drastically different from mainstream norms and worldviews” (p. 197). Considering student diversity as contributing difference as opposed rather than a deficit offers a paradigm shift in thinking when working with African American students.

Some of the school reform strategies proposed for extended learning include before and after school activities. More recently, Labone (2004) expanded the definition of teacher efficacy to include those tasks that may be beyond what has been traditionally ascribed to the classroom and considered teacher-efficacy within the framework of initiatives for school reform as well.

Beliefs

Teacher education programs are designed to prepare aspiring teachers and those already in the field for their professional work as educators. In the push for highly qualified and effective teachers mandated by the No Child Left Behind (2001) legislation of the Elementary and Secondary Education Act, considerable emphasis has been placed on ensuring and improving the quality of teachers. Although, stricter measures are being adhered to for teacher certification, little or no assessment is done to determine whether a teacher has the disposition to teach. Wilkerson and Lang (2007) explain that “disposition” refers to the attitudes, beliefs and values held by a teacher and are needed to be effective in

their profession. According to the National Council for the Accreditation of Teacher Education (2002), “Dispositions are guided by beliefs and attitudes related to values, such as caring, fairness, honesty, responsibility and social justice” (p. 53). Teachers’ own beliefs and attitudes regarding their content knowledge and their perception of their ability can facilitate positive outcomes for students.

Researchers Ross and Bruce (2007) explain that teachers who believe in their abilities to augment success set higher goals for themselves as well as their students. In turn, students’ perception of their ability is impacted. Conversely, teachers who have doubts in their abilities to succeed in a given situation, expend little effort to circumvent threats to their self-esteem. Woolfolk Hoy and Davis (2006) suggest that:

Teacher’s efficacy judgments are the result of an interaction between (a) the personal appraisal of the relative importance of factors that make accomplishing a specific teaching task easy or difficult (analysis of teaching task) and (b) a self-assessment of personal teaching capabilities and limitations specific to the task (analysis of teaching competence). (p. 118)

The two dimensions are interrelated in that how a teacher perceives his or her teaching skills and capabilities can affect the way that teacher tackles the task of augmenting learning for students. However, for this study, the focus was on the second dimension—that of self-assessment of the research participant’s perception of his ability to facilitate instruction—that leads to achievement for African American male students.

Studies of teacher efficacy have also investigated teachers' beliefs related to students who are considered difficult. Tucker et al. (2005) contended that "teachers with higher personal teacher efficacy, or belief in their ability to reach even the most difficult student, were more likely to make teacher-based suggestions to meeting the needs of the students than teachers with low personal teaching efficacy" (p. 30). Such teacher-made decisions often minimized student referrals to school personnel outside the classroom.

Teacher-Student Relationships

The exchange of teaching and learning in the classroom is impacted by the interactions between teachers and students (Ware & Kitsantas, 2007). There is growing interest in examining the connections to achievement formed from teacher-student relationships within the social context of the learning environment. In keeping with the research on teachers' perceptions of their ability to teach and to facilitate student learning, a teacher's sense of efficacy can be instrumental in building cohesive relationships between teachers and students (McKinley, 2004). According to findings from a study conducted by McKinley (2004), "The social context for learning appears to be a key determinant of teachers' success with students... and consistent with the research on contextual features and social interactions in learning environments, emphasizing fairness and respect, low favoritism, caring and low friction" (p. 3). Classroom management in a caring climate also prevailed in those learning environments as earlier indicated as an influence of teacher efficacy. In working with African American male students, teachers who take particular care to have conversations with students individually rather than as a whole class can "prevent

students' loss of peer respect and provide explicit coaching on appropriate behavior and school norms," (McKinley, 2004, p. 7).

Price (2006) offers several core characteristics of teacher-student interactions when investigating classroom social systems and academic engagement for teachers working with African American students: academic; interpersonal or complimentary; constructive or affirmative discipline; and punitive discipline. According to Price (2006), "The two common types of teacher-student interactions in classroom social systems that served to increase the academic engagement for African American students were academic-interpersonal and or academic-affirmative discipline," (p. 130). Price emphasizes the importance of this study because the findings revealed that those interactions proven to be effective were based on academics, while those interactions reported as ineffective were punitive-based.

Research in the area of middle-school practices also supports the quality of teacher-student interactions and the influence on student achievement. Mertens and Flowers (2005) reported :

Effective middle-grades teams and classrooms are those that (a) maintain high levels of academic rigor, (b) have a curriculum that is meaningful, relevant, and connects the subject matter, (c) provides opportunities for active learning, (d) goes beyond the boundaries of the team and the classroom into the community and (e) fosters a positive climate that stems from mutual respect and beneficial interactions. (p. 4)

Early adolescent development and the transition to middle school can pose challenges for both teachers and students in forming quality academic relationships. As students begin to

experience more teachers in the school setting and adjust to the rigor of various courses such as mathematics, they may experience feelings of uncertainty of their ability. Teachers who are more efficacious can facilitate a learning environment where positive interactions between teachers and students occur and students feel supported.

The Middle School Concept

The concept of middle school is an outgrowth of the dissatisfaction with the junior high school model that did not live up to the intent they were designed to fulfill. Serving as the educational setting for young adolescents between the ages of 10–15, the junior high school attempted to enhance the curriculum from the elementary school while providing the pre-requisites thought needed for high school. Instead, these “junior high schools became miniature high schools” and did not fulfill the needs of the young burgeoning adolescents which they were intended to serve (Cuban, 1992 as quoted in Williams, 2005, p. 4). The public view of the junior high school was seen as ineffective in serving the needs of developing adolescents. Thus, the middle school evolved as a model created to address the needs of a unique group of students.

Both the creation of the junior high school and middle school were conceived as part of an overall movement to reorganize secondary education from elementary to high school as the standard pattern to replace the 8-4 plan. Lounsbury (2009) explain that, indeed, the process of reorganization was achieved because it reconfigured the pattern to a 5-3-4 plan. This configuration would provide for 5 years in elementary, 3 years in middle school, and 4 years in high school. Lounsbury (2009) further adds that “just 20 years after entering the

educational arena, the number of 6–8 middle schools exceeded the number of 7–9 junior high schools” (p. 32). It appeared the middle-school concept was gaining support while the junior high school concept was waning. Grade configurations for middle-school education include both Grades 5 through 8 and Grades 6 through 8. Including the fifth grade expands the middle-grade years to 4 instead of 3 years with the grade 6 through 8 grade configuration. Beane and Lipka (2006) attributed this arrangement of grades to the 1960–1970 “baby-boomers” birth explosion that spawned student growth in many districts. The researchers further contended that it was thought that moving fifth and sixth graders to a separate school—the middle school--would prove to be cost effective and could also work toward achieving desegregation during that period in American history.

The term also used in association with middle school is middle-level education and may appear in the research. Lounsbury (2009) offers an explanation that provides insight for this educational arrangement for young adolescents:

The middle school concept is a philosophy of education with a special spirit and deep theoretical roots—a set of beliefs about kids, education, and the human experience. Those who adhere to it are passionate and determined advocates. The concept’s ideals and recommendations are direct reflections of its prime foundations, the nature and needs of young adolescents and the accepted principles of learning, both undergirded by a commitment to our democratic way of life. The middle school concept is applicable wherever any 10-to-15 year olds are enrolled. (p. 32)

Even though considerable discussion often frames middle-level education, especially regarding grade configuration, there exist several varieties that can be found including kindergarten–eighth grade, seventh–eighth grade, and seventh–12th grade. In its policy statement on grade configuration, the National Forum to Accelerate Middle Grades Reform (2008) “believes that what is most important for the education of young adolescent learners is what takes place inside each middle grade school, not grade configuration per se” (para.7). As emerging K–8 configurations become more prevalent in the return of “neighborhood schools,” Lounsbury (2009) argued that re-segregation is also on the rise in many larger cities.

The middle-school concept has several distinguishable characteristics and the National Middle School Association (2003) offers the following principles: (a) to meet the needs of young adolescent learners, middle schools strive to provide a relevant, challenging curriculum; (b) multiple learning and teaching approaches; (c) assessment and evaluation to promote quality learning; (d) organizational structures like teams that support meaningful relationships and learning, school-wide policies for health and safety; and (e) several levels of assistance for students.

In keeping with these principles, the key components of exemplary middle schools include interdisciplinary teaming, advisory programs, varied instruction, exploratory programs, and transition programs focusing on creating a smooth change of schools for the young adolescent (NMSA, 2003). When each of the components is implemented fully,

middle-school advocates attest that high performance is found in those schools and students make gains academically.

However, the middle-school concept is viewed by some as merely theory and has become the focus of debatable issues regarding whether middle-school practices yield the intended results for academic achievement based on the data generated from standardized test. Beane and Lipka (2006) iterate that full implementation has not been achieved:

therein lies the real problem with the middle school concept. On the whole, its components have not been well implemented over time and rarely as a complete set of principles and practices. Most often, the title of “middle school” has less to do with implementing the concept and more to do with changing the name on the front of the building. (p. 28)

Consequently, middle-school research to determine whether student achievement is improved as a result of implementing key practices has yielded varied results.

A study conducted by Williams (2005) in North Carolina sought to determine the level of implementation of middle-school practices in schools with either grade configuration of 5–8 or 6–8 and to see if the level of implementation had an effect on student academic growth. To measure academic growth, reading and mathematics scores from the state’s End-of-Grades test were collected from North Carolina’s Department of Public Instruction Accountability Division and evaluated over a five year period. Additionally, the researcher implemented a *Survey of Middle School Implementation Levels* (2005) to principals of middle schools to inform the level of middle-school practices. The survey was adapted for

use in North Carolina from an instrument used in other states with 123 responses from middle-school principals. This quantitative study included such variables as school size, race and ethnicity, and socioeconomic status of the student body. Data generated from the survey indicated the mean implementation level of a 50.2 score out of 63, in the sample study. The following results represent the levels of implementation of specific middle-school practices:

Principals indicated a high level of implementation (90-100%) of their staff and/or community are practicing interdisciplinary teams and common planning times for teachers, alignment of the curriculum with high standards, exploratory cycles, co-curricular activities for boys and girls of all levels, continuous adaptation of curriculum to meet students diverse needs, staff participates and selects professional development on middle school subjects, and safety and class management responsibilities are shared. Medium level of implementation (50-89%) of the staff practicing such key middle school practices as flexible scheduling, use of wide instructional strategies, expected high standards for all students, application of curriculum to real world problems and opportunities for families to contribute in setting and supporting schools goals toward high performance. Low level implementation (1-49%) of the staff and community are practicing advisor/advisee programs and using parents as more than just volunteers in school activities. (p. 100-102)

When determining the effect of implementation on the expected academic growth in the middle schools, those participating in the study made academic growth at least 60% of

the time in three of the 5 years. Williams (2005) reports schools that did make expected growth 4 of the 5 years showed higher level of implementation than those making expected growth three or fewer years. The study also revealed that schools which maintained lower free and reduced-price lunch percentages had higher levels of implementation of key middle-school practices and made expected academic growth 4 or 5 years. Considerations such as low diversity rate in these urban middle schools and those where less than half of the student body received free or reduced lunch should be noted. As the data indicated, full implementation was not achieved.

Another study to determine the level of middle-school implementation was conducted in Kentucky using a similar survey for teachers and school administrators in 50 schools that had seventh grade as part of their middle-school configuration. The survey items were categorized in several sections focusing on the middle-school concept and professional preparation, advisory, school mission, teaming, school environment, expectations, curriculum and instruction and parental involvement. Researchers Cook, Faulkner and Kinne (2009) sought to compare the level of implementation of key middle-school practices and to determine if student achievement was evident.

“Using responses of school personnel to a statewide survey, this study examined the perceived level of implementation of key tenets of the middle-school concept as outlined by *This We Believe: Successful Schools for Young Adolescents* (National Middle School Association, 2003) in schools designated Kentucky Schools to Watch (KSTW) as compared to non-designated schools” (p. 1). Additionally, the study reviewed the academic

performance of Kentucky's middle schools on the Kentucky Core Content Test to determine whether the schools identified as Kentucky's Schools to Watch experienced higher levels of academic achievement . Results from the study indicated those KSTW respondents perceived a higher level of middle-school implementation across all eight categories than those non-designated middle schools in the study. It is interesting to note the "sub-scale yielding the largest effect size was that of Parental Involvement, indicating that substantially greater efforts to involve parents in the education of their middle-level students was reported by respondents from KSTW than by respondents from non-designated schools" (p. 8). Even though parental involvement was not a major category, the respondents from the KSTW put forth greater effort to engage parents than in the non-designated schools in this study.

In the area of academic achievement, scores from the 2007 Kentucky Core Content Test in reading, writing and mathematics as well as each participating school's overall index scores were combined to include performance in science, social studies, arts and humanities, and practical living/vocational studies. The results from the data analysis of the state assessment indicated higher levels of academic success with a few low scores for the KSTW middle schools than the non-designated middle schools. An overarching conclusion drawn by Cook and others (2009) was that those schools that had higher levels of implementation of the middle-school concept "were on a trajectory of excellence based on three dimensions—academic excellence, developmental responsiveness and social equity" (p. 9). The other conclusion was that even though the study was not able to establish "causal linkage between middle-school implementation and student achievement, those schools that more fully

implemented the components of the middle-school concept experienced higher levels of academic achievement even in schools with varying demographics and in different locales” (p. 9). The research study has implications that support the premise that if fully implemented, the middle-school philosophy can improve academic performance and move from that of theory to best practice.

In some research studies, socioeconomic status is often viewed as the determining factor for academic achievement. Where free and reduced lunch percentages are low, the tendency for student achievement is more often evident. However, in a study conducted by the Center for Prevention Research and Development (for adolescents) at the University of Illinois, a Self-Study surveying parents, teachers, students and administrators evaluated middle-school practices in high poverty schools. Two key components of middle-level best practices—interdisciplinary teaming and classroom instructional practices—were explored to determine if student achievement is linked. Mertens and Flowers (2003/2005) wanted to understand whether the “combined effects of teaming with common planning time, classroom practices, length of time planning and students’ family income levels have an impact on student achievement” (p 1).

In the Self-Study, the levels of interdisciplinary team practices assessed were (a) curriculum coordination and integration practices; (b) coordination of student assignments and assessments; (c) parent contact and involvement; and (d) contact with other building resource staff. The classroom practices included (a) small group active instruction; (b) integration and interdisciplinary practices; (c) authentic instruction and assessment; (d)

critical thinking skills; (e) mathematical skill practices; (f) reading skill practices; and (g) writing skill practices (Merten and Flowers, 2005,p. 2).

Data from the study of 102 schools across three state departments in Arkansas, Louisiana, and Mississippi found the greatest correlation existed between team practice of curriculum coordination and the classroom practice of integration and interdisciplinary practices (.86), thus indicating the strength of the relationship. Mertens and Flowers (2005) contend:

To successfully coordinate curriculum at the team level, the integration of subject matter and interdisciplinary approaches at the classroom level must occur frequently, and vice-versa. A critical element to successful middle schools is to create small personalized learning communities by implementing interdisciplinary teaming. (pp. 4-5)

However, it should be noted that even though the impact of team planning and classroom practices was significant for this study, in isolation and compared to high level (four meetings per week/ at least 30 minutes) planning or low level (less than high level) planning as a single factor, there is little difference. Full implementation or collective middle-school practices provides more positive data to support impact on student achievement.

The income-level of students' families were worth noting for the middle schools participating. In the schools with the highest rate (60%) of students from low-income families, an important finding was statistically significant. There was the highest level of classroom practices serving this low income population. Merten and Flowers (2005) report,

“Clearly the teachers in these high poverty schools were engaging more frequently in middle-grades teaching and learning practices” (p. 8). Implications from the study suggested that greater impact on student achievement is sustained over time.

Middle School Reform Efforts

Since its inception, the middle-school philosophy has garnered supporters and critics over the past 4 decades. Lounsbury (2009) explained that

Because many students do not reach targeted academic goals, it has been labeled “the weak link in America’s education,” primarily by those who believe the middle school’s primary responsibility is to prepare students for advanced high school courses, and who presume that the school’s concern for students as persons takes away from its academic responsibilities. (p. 32)

Over the past two decades, the educational environment has been drastically changed by diversity of students and by the technological advances in society. However, the shift in educating for these changes has not necessarily taken hold in the process of schooling young adolescents. Consequently, there has been what Lounsbury (2009) referred to as a “narrowing of education” in that the emphasis on character and social development has diminished especially at a time when erupting societal problems are very much a part of the lives of many youth during their early adolescent years. Tyson (2009) cautioned that as discussions of middle-school reform prevail against the landscape of economic upheaval, prevailing pop culture and accountability issues, now is not the time to disregard best practices for young adolescent learners.

Those who advocate for middle-level education contend that when implemented fully, high performing middle schools are possible when they are academically excellent (challenging all students to think critically); developmentally responsive (sensitive to the needs and interests of young adolescents); and socially equitable, democratic and fair (providing all students with quality teachers, resources and learning opportunities) (Liptz & West, 2006, pp. 57-58).

Middle-level educators and researchers contend there is lack of clarity and understanding as it relates to the role of middle school. Reform initiatives for the high school clearly delineate college or career readiness skill preparation. However, for the middle school, there is a void in defining clearly what the focus should be. Assessments both nationally and internationally indicate lack of preparation for students exiting middle school. Kay (2009) reported that “American eighth graders do not stack up well on international assessments such as the Programme for International Assessment (PISA) or the Trends in Mathematics and Science Study (TIMSS) compared to their peers in advance nations” (p. 43). The report further indicated that U. S. middle-school students are not able to demonstrate the critical thinking skills or problem solving skills needed to apply their knowledge in the context of real-world applications.

Implications from reports such as these can have impact on middle-school students as they progress to the next level of education. With some high schools being labeled as “dropout factories,” students who leave middle school lacking proficiency may enter high school predisposed for underachievement. Kay (2009) emphasizes that “for many students

this (middle school) is the point in their schooling when they begin to fall behind academically, lose confidence in their ability to achieve, and become unmotivated and disengaged in school” (p. 43). In fact, researchers Neild, Balfanz, and Herzog (2007) have identified several risk factors for middle-school students attempting to graduate high school.

Neild et al. (2007) found that only “29% of sixth-grade students with one of risk factors would graduate. These risk factors included (a) F as the final grade in mathematics, (b) as the final grade in English, (c) 80% or lower attendance rate, and (d) a final behavior mark of an “unsatisfactory” in at least one class” (p. 29). Indicators such as these provide evidence for the greater need to move forward in reforming middle-level education and ensuring the trends cited are reduced, especially for African American youth, and particularly African American males who graduate at a rate of approximately 50% overall (Swanson, 2008). Prominent in its efforts to advance middle-level education, the Carnegie Council on Adolescent Development produced *Turning Points: Preparing American Youth for the 21st Century* (1989) and *Turning Points 2000: Educating Adolescents in the 21st Century* (Jackson & Davis, 2000) as means of defining the middle-school philosophy and offering guiding principles for improving middle-grades education. Andrews (2009) offered that middle schools should be part of the discussion to improve the dropout rates in high school as lessons learned from the research.

Several federal initiatives and organizations have been in the forefront of leading the way for improving education nationwide. During the administration of George W. Bush, No Child Left Behind (2001) legislative mandates were put in place to work toward proficiency

for all students by 2014. Sanctions were imposed on schools and districts that did not make “adequate yearly progress” for all its students. Still, after nearly a decade, middle-school students are not performing at the level of proficiency expected. According to the National Assessment of Educational Progress (NAEP, 2007), 30 % of eighth graders are below the basic level in mathematics and African American students trail with a 32 point gap in mathematics mean scores behind their Caucasian American counterparts (National Center for Education Statistics, Mathematics 2009). Under the current administration of President Barak Obama, reform efforts in education have received a financial boost with the American Recovery and Reinvestment Act of 2009 and reform models for schools are being introduced that will place stricter accountability on states and districts.

In addition to concerns of reforms nationally, there is also concern that the U.S. is losing its educational lead internationally as the world in which students live becomes more global. Jackson (2009) advocates that new middle schools are needed for the future and during this massive push for educational reform:

Deeper knowledge about other cultures, sophisticated communication skills including the ability to speak at least one language in addition to English, expert thinking skills required in a knowledge-driven global economy, and the disposition to positively interact with individuals from varied backgrounds—these are the foundations of work and citizenship in the 21st century. (p. 7)

The National Middle School Association established the National Forum to Accelerate Middle-Grades Reform in 1997 with the express purpose of advancing middle-

school concepts and to promote awareness. Its policy statement *This We Believe: Successful Schools for Young Adolescents* (National Forum, 2003) provides the necessary characteristics for successful schools for young adolescents and serves as the guiding principles for schools working toward that effort. The National Forum seeks to galvanize “stakeholders to speak with a common voice to leverage research, policy, leadership, and replicable model practices to drive middle-grades reform” (para. 6). In an effort to recognize and celebrate those middle-level schools that are high-performing schools, states all over the country are invited to participate in the National Forum’s *Schools to Watch* initiative. Currently, there are approximately 200 schools meeting the National Forum’s high criteria standards.

Mathematics Education Reform

There is an ever-growing need for students to understand math and to become mathematically proficient in a technology-driven society in the 21st century. Yet, for a substantial number of students, mathematics education is not sufficient. The reasons may vary from lack of opportunity to learn, to poor quality of teaching the mathematics curriculum, to limited motivation on the part of the student. International and domestic comparisons show that American students have not been succeeding in the mathematical part of their education at anything like the level expected of an international student (National Mathematics Advisory Council Final Report, 2008). According to the National Assessment of Educational Progress, there are positive trends in scores at Grades 4 and 8 and also less positive: 32% of students are at or above the proficient level in Grade 8, but only 23% are proficient at Grade 12 (National Center for Educational Statistics, 2008).

According to the National Mathematics Advisory Panel (2008):

Moreover, there are large, persistent disparities in mathematics achievement related to race and income—disparities that are not only devastating for individuals and families, but also project poorly for the nation’s future, given the youthfulness and high growth rates of the largest minority populations. Additionally, the sharp falloff in mathematics achievement in the U. S. begins as students reach late middle school, where, for more and more students, algebra course work begins. (pp. xii-xiii)

Middle-school mathematics comprises Grades 6, 7, and 8. This can be a crucial stage for attaining foundational mathematic skills that build the framework necessary for higher skills needed for algebra and geometry.

Recognizing the need for reform in mathematics education spawned the creation of the National Mathematics Advisory Panel in 2006, with the explicit duties of determining the “best available scientific evidence and recommending ways to foster greater knowledge of and improved performance in mathematics among American students” (p. xiii). As a result of NMAP’s research, the following six key elements comprised the report:

1. The mathematics curriculum in Grades preK–8 should be streamlined and should emphasize a well-defined set of the most critical topics in the early grades.
2. Use should be made of what is clearly known from rigorous research about how children learn.
3. Educational leadership should recognize mathematically knowledgeable classroom teachers as having a central role in mathematics education.

4. Instructional practice should be informed by high-quality research and by the best professional judgment and experience of accomplished classroom teachers.
5. NAEP and state assessments should be improved in quality and should carry increased emphasis on the most critical knowledge and skills leading to Algebra.
6. The nation must continue to build capacity for more rigorous research in education so that it can inform policy and practice more effectively. (National Math Panel Report, 2008, p.11)

The report probed further into the processes of learning and teaching and concludes that mathematics performance and learning of groups that have been traditionally underrepresented in mathematics fields can be improved by interventions that address social, affective, and motivational factors.

This research study provided an opportunity to explore the belief system and strategies used by an experienced mathematics teacher to move underachieving students to the level of academic proficiency in mathematics. This research study addressed specifically Key Element 4 of the National Mathematics Advisory Panel (2006), by looking at the judgments and the experiences of this mathematics teacher who is a veteran teacher in his field. The panel offered that there is little known from existing high-quality research about what effective teachers do to generate greater gains in student learning. The intention of this study was to provide additional research that could be drawn upon to begin to answer some of those probing questions, especially as they relate to the underachievement of African American male students.

Another important means of offering reform in mathematics education has been the formation and revision of principles and standards within the National Council of Teachers of Mathematics (NCTM). Principles serve as a guide for promoting high-quality mathematics education while the standards explain the content and processes by which students should learn mathematics. Principles and Standards together serve as a vehicle for consistent reform in mathematics education. The revision of principles over the past decade included equity, curriculum, teaching, learning, assessment and technology. This study focused on the equity, the teaching, and the learning principles to determine if they manifest in the instructional practices of the veteran mathematics teacher.

The Equity Principle

The equity principle states that excellence in mathematics education requires equity—high expectations and strong support for all students. This principle can translate into what is often considered as the core belief for a democracy. However, according to NCTM (2000), this vision challenges a pervasive societal belief in North America that only some students are capable of learning mathematics and can also lead to low expectations for those students who live in poverty and many non-White students in other demographic groups. Teachers communicate expectations in their interactions with students during classroom instruction, through their comments on students' papers, when assigning students to instructional groups, through the presence or absence of consistent support for students who are striving for high levels of attainment, and in their contacts with significant adults in a student's life. Actions

taken outside the classroom such as decisions regarding class assignments affect student self-efficacy relating to mathematics as well.

Equity also requires accommodating differences to help everyone learn mathematics by providing solid support for their learning and is responsive to their prior knowledge, intellectual strengths, and personal interest. Taking into consideration differences in learning and not deficits in learning can enhance the vision of equity for all students. The use of technology works to achieve equity for all students in varying geographic regions—whether urban, rural, state, or internationally. Thus, equitable distribution of resources, both human and material resources are necessary for achieving and sustaining equity. Instructional tools, curriculum materials, special supplemental programs, professional development for teachers, and the skillful use of community resources are necessary in supporting equity (National Math Panel Report, 2008, p. 15).

The Teaching Principle

The teaching principle affirms that effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well. What this principle translates to is that teachers must know and understand three knowledge bases: their mathematical content, the challenges their students are likely to encounter learning certain ideas, and pedagogy. Pedagogical knowledge, much of which is acquired and shaped through the practice of teaching, helps teachers understand how students learn mathematics, become facile with a range of different teaching techniques and instructional materials, and organize and manage the classroom (National Math Panel

Report, 2008, p. 17). The classroom serves as the incubator for intellectual thought and decision making. Consequently, in order for the learning environment created by teachers to be conducive to learning, it must nurture and support thinking, questioning, problem solving, and the discussion of ideas and strategies as generated in a supportive classroom.

Effective mathematics teaching requires a serious commitment to the development of students' understanding of mathematics. Having the knowledge of how to ask questions and plan lessons that reveal students' prior knowledge as well as recognizing there is no one "right way" to teach contributes to the complexity involved in teaching mathematics.

Teaching mathematics well involves creating, enriching, maintaining, and adapting instruction to move toward mathematical goals, capture and sustain interest, and engage students in building their mathematical understanding and knowledge. Experienced or veteran teachers may be able to support beginning teachers as mentors as they move toward highly effective teaching.

The Learning Principle

The Learning Principle iterates that students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge. Mere memorization of facts will not suffice as it may have prior due to technological advances in the 21st century. Being proficient in a complex domain such as mathematics entails the ability to use knowledge flexibly, applying what is learned in one setting appropriately in another. Although proficiency is often associated with accountability standards and measured in many school districts across the United States as a numerical

score on an end-of-course standardized test, there is a broader meaning associated with proficiency. Having a strong conceptual understanding is vital to dealing with novel problems and unique settings that may arise. Connecting the learning to real-world experiences provides a context for new ideas and concepts to take hold (National Math Panel Report, 2008).

As change becomes more synonymous with life in the 21st century, it is inevitably important that students learn to solve new kinds of problems they will face in the future. Learning with understanding can be further enhanced with classroom interactions, as students propose mathematical ideas, conjectures, learn to evaluate their own thinking and that of others, and develop mathematical reasoning skills (Hanna & Yackel, in NCTM, 2000). All such experiences are useful and productive in developing an autonomous learner.

Mathematic Standards for Middle Grades

What students should know and have the ability to do in the area of mathematics education has led to the creation of standards as guideposts for educators. Standards provide the foundation for curriculum as set forth at the state, national and international level: “They specify the understanding, knowledge, and skills that students should acquire from prekindergarten through Grade 12” (Principles and Standards for School Mathematics, 2000, p. 29). The National Council of Teachers of Mathematics had a vision in mind for improving and expanding the changing role of mathematics as evidenced in everyday life, as part of the workplace, and in the area of technology. NCTM’s position is that mathematical competence prepares students for future opportunities and the lack thereof, places limits on those

opportunities. Consequently, the publication of *Principles and Standards for School Mathematics* (2000) sought to provide a framework for teachers and educators to create the necessary understanding of mathematics in classrooms that are “equitable, challenging, supportive and technologically equipped for the twenty-first century” (p. 4). There are variables that have created less than effective mathematics education, thus the need for improvement is eminent.

The role of standards is to provide a common language in determining quality in advancing toward goals that help foster improvement in mathematics education. There are two major categories for standards in mathematics: Content Standards and Process Standards. Both standards are interrelated to help facilitate the other “because mathematics as a discipline is highly interconnected and integrated. Processes can be learned within the Content Standards, and content can be learned within the Process Standards” (p. 31). The ten standards apply to all grade levels from prekindergarten through high school. However, there is greater emphasis at specific grade levels for particular standards. Content Standards describe what students should know and include number and operations, algebra, geometry, measurement, and data analysis and probability. Process Standards determine the method of acquiring the content knowledge and encompass problem solving, reasoning and proof, communication, connections and representation. For the purpose of this literature review, the focus was on middle-grades standards in mathematics education.

As discussed earlier, middle level education is at a pivotal point in working to reform itself and close the gaps that exist academically for early adolescents. In keeping with the

social, emotional and intellectual changes that are unique to this age group, middle-grade students can benefit from an engaging and rigorous mathematics education that factors their needs and sensitivities into its program: “Many students will solidify conceptions about themselves as learners of mathematics—about their competence, their attitude and their interest and motivation” (NCTM, 2000, p. 211). Therefore, the standards proposed for middle school are intended to be rigorous and stretch beyond elementary mathematics education. Algebra and geometry are two the foci in middle-grades mathematics. NCTM (2000) outlined that middle-grade students should:

See algebra and geometry as interconnected with each other and with other content areas in the curriculum. They will have experience with both the geometric representation of algebraic ideas, such as visual models of algebraic identities, and the algebraic representation of geometric ideas, such as equations for lines represented on coordinate grids. (p. 212)

Caution is given to instruction that separates algebra and geometry content from other areas. In order for such integration to happen, there has to be teacher capacity factored into the standards. Recognizing the need for on-going professional development, NCTM contends that “teachers need to develop a sound knowledge of mathematical ideas and excellent pedagogical practices and become aware of the current research on students mathematics learning” (p. 213). The need for this study became more evident given the direction and focus for mathematics education in providing skilled and talented students to fill the newly emerging demands brought on by technological advances in this century. The National

Mathematics Advisory Panel (NMAP) prepared a report, *Foundations for Success* (2008) that spoke to the need for improving mathematics education in the United States. The findings voiced concerns that placed mathematics education as a national interest.

Mathematics literacy is a serious problem in the United States. According to Phillips (2007), 78% of adults cannot explain how to compute the interest paid on a loan, 71% cannot calculate miles per gallon on a trip, and 58% cannot calculate a 10% tip for a lunch bill. Further, it is clear from the research that a broad range of students and adults also have difficulties with fractions (e.g., Hecht, Vagi, & Torgeson, 2007), a foundational skill essential to success in algebra. The recent National Assessment of Educational Progress (NAEP, “The Nation’s Report Card”) shows that 27% of eighth graders could not correctly shade $\frac{1}{3}$ of a rectangle and 45% could not solve a word problem that required dividing fractions (U.S. Department of Education, 2004 in “NMAP Final Report,” 2008, p. 3).

Conclusive evidence from this report placed algebra as a primary interest as it is the prerequisite to post-secondary education. The disparities that exist in mathematics education, when considering race and socioeconomic status speaks to the inherent need to ensure students entering college are well prepared.

Algebra Standard

A significant amount of algebra has been proposed for middle level mathematics to provide students with a foundation for algebra over the course of their tenure in middle school. By the time middle school students are ready to exit eighth grade, they will be expected to be proficient in number properties and operations, measurement, geometry,

algebra, and data analysis, statistics, and probability. Thirty percent of the content area these students will be assessed is in algebra. NAEP (2009), *The Nation's Report Card*, reported that 47% of eighth-grade students were able to correctly answer an algebra problem on linear equations (p. 3). Clearly with approximately one-third of the math skills tested in algebra, greater emphasis in the standards for algebra is needed. Thus, the NMAP (2009) created the *Critical Foundations of Algebra* to reflect judgments considered essential for students to be ready for algebra. These considerations include fluency with whole numbers, fluency with fractions, and particular aspects of geometry and measurement (p. 17- 18). The term fluency is used to reflect proficiency in each of the respective areas. These recommendations are encouraged to be met in middle-grade mathematics as a basis for learning algebra. The sequence would create benchmarks for instruction at each grade in middle school. Therefore, fluency with numbers would encompass Grades 3-5; fluency with fractions would encompass Grades 4-7; and geometry and measurement would encompass Grades 5-7. Thus, by eighth grade, students have a strong enough foundation for “authentic” algebra (NMAP, 2009, p. 23). The term authentic refers to the descriptors for Algebra I or II courses.

There are four standards recommended for middle-grades algebra: understand patterns, relations and functions; represent and analyze mathematical situations and structures using algebraic symbols; use mathematical models to represent and understand quantitative relationships; and analyze change in various contexts. For each of these standards, there are accompanying expectations of what middle-grade students should be able to do:

Understand patterns, relations, and functions—

- Represent, analyze, and generalize a variety of patterns with tables graphs and words, and when possible symbolic rules;
- Relate and compare different forms of representation for a relationship;
- Identify functions as linear or nonlinear and contrast their properties from tables, graphs or equations;

Represent and analyze mathematical situations and structures using algebraic symbols—

- Develop an initial conceptual understanding of different uses of variables;
- Explore relationships between symbolic expressions and graphs of lines, paying particular attention to the meaning of intercept and slope;
- Use symbolic algebra to represent situations and to solve problems, especially those that involve linear relationships
- Recognize and generate equivalent forms for simple algebraic expressions and solve linear equations

Use mathematical models to represent and understand quantitative relationships—

- Model and solve contextualized problems, using various representations such as graphs, tables, and equations

Analyze change in various contexts—

- Use graphs to analyze the nature of changes in quantities in linear relationships (p. 222).

It should also be noted that the competencies cited do not follow a set timetable as individuals are different and progress at their own unique pace. Also of concern is underachievement of students from underserved racial backgrounds, namely African Americans and Latino Americans. Coupled with the “equity principle” which requires excellence through high expectations and opportunities for mathematical learning for all students, the standards can serve as direction in providing quality instruction.

Geometry Standard

As early as preschool, the study of geometric shapes is a part of the curriculum. Progressing through elementary school, students begin to learn to manipulate their world with tools that provide meaning to properties of the geometric objects. However, in middle-grade mathematics, the emphasis begins to shift to more formal problem solving experiences that are more investigative in nature. According to the National Council of Teachers of Mathematics (2000), “geometry provides a rich context for the development of mathematical reasoning, including inductive and deductive reasoning, making and validating conjectures, and classifying and defining geometric objects” (Principles and Standards for School Mathematics, p. 233).

Students should come to the study of geometry with prior knowledge from elementary school mathematics understanding two- and three-dimensional shapes, lines,

angles, and points to begin building the foundation necessary to determine relationships.

Consequently, the four Geometry Standards outlined may overlap with algebra and measurement recommendations as well. The Geometry Standards for middle-grades mathematics include analyzing characteristics and properties of geometric shapes, specifying locations and describing relationships, applying transformation and using symmetry, and visualizing spatial reasoning. Geometry accounts for 20% of the questions on the mathematics assessment used to determine the nation's proficiency (NAEP, 2009).

Accompanying the standards are competencies students are expected to perform as a result of having been taught geometry at the middle school level:

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships

- Precisely describe, classify and understand relationships among types of two- and three-dimensional objects using their defining properties;
- Understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects;
- Create and critique inductive and deductive arguments concerning geometric ideas and relationships, such as congruence, similarity, and the Pythagorean relationship.

Specify locations and describe spatial relationships using coordinate geometry and other representational systems

- Use coordinate geometry to represent and examine the properties of geometric shapes;
- Use coordinate geometry to examine special geometric shapes, such as regular polygons or those with pairs of parallel or perpendicular sides.

Apply transformations and use symmetry to analyze mathematical situations

- Describe sizes, positions and orientations of shapes under informal transformations such as flips, turns, slides, and scaling;
- Examine the congruence, similarity, and line or rotational symmetry of objects using transformations.

Use visualization, spatial reasoning, and geometric modeling to solve problems

- Draw geometric objects with specified properties, such as side lengths or angle measures;
- Use two-dimensional representations of three-dimensional objects to visualize and solve problems such as those involving surface area and volume;
- Use visual tools such as networks to represent and solve problems;
- Use geometric models to represent and explain numerical and algebraic relationships;
- Recognize and apply geometric ideas and relationships in areas outside the mathematics classroom, such as art, science, and everyday life (p. 233).

Providing these standards and competencies for geometry in the middle grades may appear rigorous for middle level education. However, it is the belief of the NCTM (2000) that “ambitious standards are required to achieve a society that has the capability to think and reason mathematically and a useful base of mathematical knowledge and skills” (p. 29). Throughout the geometry standards has been constant promotion of the ability to reason. The National Research Council (2006) contends that “reasoning is the glue to mathematics” and that reasoning mathematically refers to thinking in a logical manner to be able to explain and justify a solution to a problem (p. 14). Although reasoning is one of the five strands attributed to mathematics proficiency, the other four—understanding, computing, applying, and engaging—work in concert to advance students to become successful mathematically.

Measurement Standards

Measurement is a mathematics content area that provides many hands-on experiences for students throughout their tenure of schooling and in their everyday experiences. As one of the content areas for middle level mathematics, measurement provides the framework for understanding such concepts as length, area and volume in both the standard unit and metric unit systems used internationally. Measurement is defined as the assignment of a numerical value to an attribute of an object and understanding what an attribute is and the units and processes. There is a growing concern that nationally students do not measure up to their international counterparts in the area of measurements. According to Chapin and Johnson (2006), “results of national and international assessments indicate that U.S. students of all ages are significantly deficient in their knowledge of measurement concepts and skills” (p.

271). The NAEP (2009) mathematics assessments accounts for 15% of the emphasis is on the content area of measurement. Consequently, for students to gain more proficiency in measurement, it is imperative that the recommended Measurement Standards be understood and implemented. The NCTM (2000) cites that the skills and concepts middle school students learn in measurement intersects with those needed in geometry, algebra and science; thus:

Important aspects of measurement in the middle grades include choosing and using compatible units for attributes being measured, estimating measurements, selecting appropriate units and scales on the basis of precision desired, and solving problems involving the perimeter and area of two-dimensional shapes and the surface area and volume of three-dimensional objects. (p. 241)

The two Measurement Standards include understanding measurable attributes and applying the appropriate use of tools and formulas. Although there are fewer standards for measurement when compared to the other mathematic content areas, gaining proficiency requires a focused emphasis in the middle grades. The following recommendations for middle grade Measurement Standards are accompanied by competencies sixth- through eighth-grade students are expected to know or perform:

Understand measurable attributes of objects and the units, systems and processes of measurement

- Understand both metric and customary systems of measurement;

- Understand relationships among units and convert from one unit to another within the same system;
- Understand, select, and use units of appropriate size and type to measure angles, perimeter, area, surface area and volume.

Apply appropriate techniques, tools, and formulas to determine measurements

- Use common benchmarks to select appropriate methods for estimating measurements;
- Select and apply techniques and tools to accurately find length, area, volume and angle measures to appropriate levels of precision;
- Develop and use formulas to determine the circumference of circles and the area of triangles, parallelograms, trapezoids, and circles and develop strategies to find the area of more-complex shapes;
- Determine strategies to determine the surface area and volume of selected prisms, pyramids and cylinders;
- Solve problems involving scale factors, using ratio and proportion;
- Solve simple problems involving rates and derived measurements for such attributes as velocity and density (NCTM, 2000, p. 240).

Adherence to these standards has become more pertinent as students become members of a global society that transcends borders. Although the customary unit of measure is still viable

in the U.S., the metric system is the common language of measurement worldwide. Thus, becoming proficient in measurement is incumbent for all students in the middle grades as this is the grade span in which greater emphasis is placed.

Summary

As expressed in the literature review, there are significant challenges facing African American male students regarding academic performance and achievement. Ranging from stereotypes to negative school experiences, a significant number of African American males are placed at risk, causing them to have limited access to opportunities brought about from education.

Even though schools are viewed as sites for identity formation, for the African American male, the prevailing school culture often marginalizes his academic and social status. Consequently, the question “Do teachers matter?” resonates within the arena of school reform and teacher education. Investigating teacher efficacy and understanding what role it plays in the teaching and learning process has been informative in working with underachieving students.

As proposed in the previous chapter, this qualitative case study utilized observations, interviewing, and data collection as a means of investigating teacher efficacy of an experienced African American male mathematics teacher. Review of the literature revealed that effective teaching of African American males can effectively influence cognitive development and academic achievement of underperforming students given instruction utilizes culturally relevant pedagogy. A teacher’s belief in his/her own capability to teach in

the face of challenging situations or with underperforming students revealed the value of high teacher efficacy in order to commit and persevere over time. Additionally, the revised standards and principles of the National Council of Teachers of Mathematics have sought to provide a guide to excellence in teaching mathematics through advocating equity and excellence in teaching by competent and qualified teachers.

Chapter 3: Methodology

“We must go beyond textbooks, go out into the bypaths and untrodden depths of the wilderness and travel and explore and tell the world of the glories of our journey” (John Hope Franklin, 2008).

This research study investigated the instructional practices of an experienced African American male mathematics teacher to determine what he perceives as his capabilities in eliciting academic proficiency for his African American male students. To better understand this mathematics teacher’s story and his unique approach, qualitative research methods were utilized. In-depth descriptions of his instructional practices and the philosophical beliefs held by the research participant were captured in this qualitative study. The research participant’s experiences with African American male students who have made the transition from underachievement to proficiency were explored. Silverman (2005) emphasizes that “in qualitative research detail is found in the precise particulars of ... people’s understandings and interactions” (p. 9). Consequently, qualitative research provides the mechanisms with which to investigate instructional practices and explore perceptions held by a veteran mathematics teacher through data collection and data analysis. According to Merriam (2009), qualitative researchers seek to understand “the meaning people have constructed, that is how people make sense of their world and the experiences they have in their world” (p. 13).

Qualitative research, as defined by Creswell (2007), “begins with assumptions, a worldview, the possible use of theoretical lens, and the study of research problems inquiring

into the meaning individuals or groups ascribe to a social or human problem” (p. 37). In this research study, the African American mathematics teacher was the primary individual studied to determine what he perceived as his capabilities in working with underachieving African American male students. Although there has been attention given to the lack of proficiency in academic achievement for a significant number of African American males, Davis (2006) emphasizes there is a “disconnect between the socially constructed ‘Black male crisis’ and what is known about these students’ school experiences and academic attitudes...The field is unfortunately stuck in the problem without clear directions and paths to solutions” (p. 399). Having the opportunity to explore the lived experiences and perceptions of a male mathematics teacher who is African American provides an important perspective to add to the discussion as it relates to how instructional practices were organized and delivered to struggling students, particularly, African American male students.

Over the past two decades, education reform has been the focus of legislators in an attempt to correct a system that has not worked for all of its constituents. During former President George W. Bush’s administration, legislation was passed, the No Child Left Behind Act of 2001, with the intent of having all students proficient, as measured by a standardized test, by the year 2014. The goal set for all schools regardless of the level of diversity is to make AYP in reading and mathematics in all target areas or groupings of students. For this study, mathematics exclusively was the focus as it related to student achievement. North Carolina’s statewide results in mathematics for Grades 3-8 for 2008-2009 reported 88.9% proficient overall. This means 72 out of 81 targets or subgroups made

AYP (North Carolina Department of Public Instruction-- NCLB Newsletter, August, 2009). According to North Carolina's Report Card, those students with disabilities (53.4%), limited English proficiency (67.3%), and African American students (64.4%), were found to be those students trailing behind and not making yearly gains. President Barak Obama has infused more supplemental dollars into the Elementary and Secondary Education Act of 1965 under the American Reinvestment and Reform Act of 2009 (ARRA) to further enhance reform initiatives that promote student achievement of low-performing students.

The rationale for conducting this qualitative research is based on two of several premises offered by Creswell (2007):

We conduct qualitative research because we want to understand the contexts or settings in which participants in a study address a problem or issue. We cannot separate what people say from the context in which they say it—whether this context is their home, family, or work. Also, to develop theories when partial or inadequate theories exist for certain populations and samples or existing theories do not adequately capture the complexity of the problem we are examining. (p. 40)

Thus, this descriptive case study was situated during a time of heightened public interest and funding to strengthen education reform that is intended to improve teaching and student learning.

Appropriateness of the Approach

Qualitative research is characterized by several dimensions that make it conducive to conducting research in an educational setting. The characteristics that research scholars most

often share as those that provide descriptors explaining the nature of qualitative research include (a) situating the study in the natural setting, (b) the focus on meaning and understanding, (c) the researcher as the primary instrument, (d) an inductive process, (e) subjectivity, and (f) the product is richly descriptive (Creswell, 2007; Hatch, 2002; Marshall & Rossman, 2006; Merriam, 2009). For this research study, each of those characteristics was evident.

Qualitative research was conducted at the site where research participants experience the issue under study. According to Creswell (2007), “This up-close information gathered, by actually talking directly to people and seeing them behave and act within their context, is a major characteristic of qualitative research” (p. 37). The study was conducted in a mathematics classroom in which instruction is facilitated by an African American male teacher who works with students at various levels of becoming proficient in mathematics in middle school.

Qualitative research also focuses on meaning and understanding. During the investigative study, the researcher is focused on “learning the meaning the participants hold about the problem or issue, not the meaning the researchers bring to the research or writers from the literature” (Creswell, 2007, p. 39). By capturing the actions and perspectives of the African American male teacher within the realities in which he works, meaning and understanding were advanced in some of the complexities involved in teaching and learning.

In qualitative research, the researcher acts as the primary research instrument. Data collection in the form of interviews and observations from the research participant provide

narrative to further inform the belief systems operating within the individual or group studied. In this study, what the African American mathematics teacher perceived as his capabilities in working to bring underachieving students along the proficiency continuum was explored through various data sources. Once reviewed, the data was organized to determine emerging patterns or themes. Creswell (2007) adds, “It may also involve collaborating with the participants interactively, so they have a chance to shape the themes or abstractions that emerge” from this inductive data analysis process (p. 39).

Qualitative Case Study

A case study framed the methodology for doing this research. Two of the leading case study researchers in qualitative research are Merriam (2009) and Yin (2009). Merriam (2009) defines “a case study as an in-depth description and analysis of a bounded system”(p. 40). Merriam further explains that “for it to be a case study, *one* particular program or *one* particular classroom of learners (a bounded system), or *one* particular older learner selected on the basis of typicality, uniqueness, success, and so forth, would be the unit of analysis (p. 41). Her definition is aligned with that of other qualitative researchers (Bogdan & Bilken, 2007; Creswell, 2007).

The decision to use a case study method may be prompted by several factors. Yin (2009) offers these circumstances as justifiable for conducting a single-case study:

1. It represents the critical case in testing a well-formulated theory and can confirm, challenge, or extend the theory.
2. The case represents an extreme or unique case that is rare.

3. It is representative or typical and lessons learned can be informative.
4. The case is revelatory and the researcher has an opportunity to investigate a problem common across the country
5. The case is longitudinal and studies the case over two or more points in time. (pp. 47-49).

Most of the rationales presented by Yin (2009), with the exception of the fifth one, can be attributed to the justification for conducting this case study. Considering the widespread issues and concerns for educating African American males in public schools, there persist divergent ideas on this topic. Merriam's (2009) comprehensive rationale explains succinctly why the case study approach is being used for this qualitative research study: "The decision to focus on qualitative case studies stems from the fact that this design is chosen precisely because researchers are interested in insight, discovery and interpretation rather than hypothesis testing" (p. 42). As Davis argues, "While it is true that African American males often pose a challenge to schools, the question of whether school leaders, teachers, and educational institutions themselves provides meaningful opportunities for effective understanding of these students remains unanswered" (p.400).

Consequently, an investigation of instructional practices and personal beliefs that explore teacher efficacy is appropriately suited for this qualitative study. Providing insights through reflections and the experiences of a middle-school mathematics teacher who is African American and has worked with African American male students has offered richness and depth to this study.

Descriptive Case Study

One of the special features attributed to a case study is that it can be descriptive. According to Merriam (2009), “Descriptive means that the end product of a case study is a rich, ‘thick’ description of the phenomenon under study; and thick means the complete, literal description of the incident or entity being investigated”(p. 43). This study was a descriptive single case study investigating the instructional practices of an experienced African American male mathematics teacher and what he perceives as his capabilities in augmenting academic proficiency in mathematics for his African American male students. There is teacher shortage throughout the nation and particularly African American men; thus, this study provides a viable means to understand the phenomenon associated with educating African American male students.

Proficiency in mathematics is an important indicator for student achievement along the continuum of academic success. However, for a significant number of African American students, particularly African American male students, there exist considerable lags in achievement. The descriptive approach to this single case study facilitated entry into the education setting to fully investigate teaching practices and allow reflection activities on the experiences of a veteran mathematics teacher with his African American male students who have been under-achieving and moving toward proficiency.

Research Questions

This research study sought to answer the following questions:

- What are the instructional practices of an experienced African American male mathematics teacher?
- And what does he perceive as his capabilities in augmenting academic proficiency for his African American male students?

Effective teaching and student achievement are major focuses for school reform initiatives. Efforts to narrow the achievement gap and move all students to proficiency by 2014, is an arduous undertaking. An investigation of instructional practices and teacher beliefs regarding the ability to move under-achieving students to proficiency is worth exploring. Urban Institute researcher LoGerfo (2006) asserts that “a strong sense of responsibility for outcomes counts as much as a teacher’s level of education and years of teaching experience” (p. 2). Having the opportunity to explore the belief system operating within an experienced African American male teacher has provided insightful explanations answering both overarching questions framed for this study.

Site Selection

This research study was conducted in Raleigh, North Carolina, where rapid growth rates places the state in the top 20% of the states in the nation with the largest student populations. The Wake County School system’s student population has doubled in the past two decades to approximately 140,000 students with projections of 40,000 additional students by 2020 (Wake County Public Schools Annual Demographic Report, 2010-11). Demographically, the racial and ethnic mix for this district has become more diverse. Data collected during the 2011-2012 academic year reported Caucasian Americans representing

49.3%, African Americans 24.7%, Hispanic or Latinos 15%, Asian 6.3%, Pacific Islanders 0.1%, American Indian 0.4, and multiracial 4.3% of the student population.

Experiencing this type of growth rate fosters construction of multiple new schools each year to attempt to keep pace with the growing demand where approximately 20,000 new residents enter the district each year. As one of the fastest growing areas in the state, keeping pace with continuous and steady growth has been challenging in terms of capacity and human resources. Currently, there are 165 schools in the district, with two schools built each year to accommodate growth.

The middle school selected for this study is a magnet school for gifted and talented students in the creative arts for Grades 6, 7, and 8. Enrollment approached 1,100 students for this rather large middle school during the 2010-11 academic year. To achieve racial balance in the district, students are bused to the school and come from outside the school neighborhood. For anonymity purposes, the pseudonym DePaul Middle School will be used for this study.

The school was established in the early 1950s and originally served as the only high school for African Americans in a then segregated district. Today, it is situated in the same location, although the neighborhood has experienced some changes. New public housing has been constructed with many of the single family homes still in existence. The school has a revered and honored history that is kept alive and vibrant by some of the former school staff and members in the community. They are very visible in the school, volunteering and serving in advisory capacities at the school.

Sample Selection

An African American male mathematics teacher was the research participant for this descriptive case study. I learned of the study participant during a parent-teacher training session for which he served as a presenter demonstrating how parents and teachers can engage students in making mathematics interesting to learn. His ability to explain mathematical concepts in various formats with relevancy, served as the impetus to want to explore more of his instructional practices. Additionally, my lived experiences as a high school teacher, who participated on numerous task force committees working to develop strategies to scaffold academic gains for underachieving African American students, fueled the idea of investigating the study participant. He was selected for his effectiveness in teaching middle school mathematics to diverse students with varying levels of ability, and his success moving his students to proficiency as measured by state and local assessments. Other factors included his extensive content knowledge, his years of experience, his gender, and the fact he is one of few African American men in the teaching workforce.

Secretary of Education Arne Duncan (2009) made reference to the less than 2% of African American men in the teaching profession as troubling during a speech on *Teacher Preparation* delivered at Teachers College, Columbia University. As a mathematics teacher in one of 32 middle schools in the district, he represented the few male teachers reflecting diversity either by gender or race in the teaching staff in the public school system. Caucasian female teachers dominate the teaching profession, ranging from 75%-89% female in comparison to the male teachers who comprise approximately 10%-25% (National Center for

Education Statistics, 2008). Therefore, investigating the perceptions and instructional practices of an African American male who teaches mathematics to a subgroup of African American male students consistently found to be underachieving proved to be instructive as well as informative.

As discussed in the literature review, the participation of men who teach, especially African American men who teach, has declined substantially over the past two decades. This decline manifests itself as few positive role models in public spaces such as schools where boys and young men interact. Even though the issue of gender is often circumvented in the research, it has merit affecting the development of masculine identity. Schools often serve as the sites for the socially constructed sense of maleness. Weins (2005) concurred that the issue of masculinity, the role the schools play in its formation, and the ways the school responds are of importance when considering the education of African American males.

Another criterion for selection of this research participant was his effectiveness (as measured by formative and standardized assessments) in working with students who range from low performing to high performing across the racial and ethnic spectrum. During the tenure of his professional career, school administrators have come to rely on him for working with the most challenging as well as the brightest students. Thus, he has gained the respect as well as admiration from colleagues, parents and students alike. It was the intention to utilize him purposefully as a unique research participant in order to gain a deeper and richer understanding of him and his approach to instruction and learning. This approach is known as purposeful sampling. Merriam (2009) relates that since qualitative inquiry seeks to

understand the meaning of a phenomenon from the perspectives of the participants, it is important to select a sample from which the most can be learned. In this era of education reform when stakeholders such as teachers and students are being held accountable, having the opportunity to gather rich and insightful information that is pertinent to the dilemma of educating African American males is important to the purpose of this research study and to the broader education community.

Data Collection

Collecting research data in a qualitative study utilizes several approaches. Hatch (2002) explains that “while the researcher’s stance in relation to his or her data may be different across qualitative paradigms, the basics of doing observation, interviewing, and unobtrusive data collection are similar” (p. 71). Consequently, to be able to afford richness and depth in this single descriptive case study, the use of each of the aforementioned will be an integral part of the data-collection process.

Observations. Conducting observations in the classroom setting was one of the strategies used to gain insights regarding what and how this mathematics teacher goes about his work of teaching and working with ethnically diverse and under-achieving African American male students in a middle-school environment. According to Patton (2002), direct personal contact and observations of a setting provide the researcher with several key advantages: (a) the ability to better understand and capture the context in which people interact, (b) allows the researcher to be open to discovering inductively how the participants are understanding the setting, and (c) a chance to learn things people may be unwilling to talk

about in an interview. More specifically, as the researcher, the observations were focused within the classroom setting where interactions between the research participant and his students were prevalent.

Observations began the second semester in the middle-school mathematics teacher's class of eighth-grade students. It was my responsibility to observe carefully, allowing the veteran teacher's story to unfold as it related to his instructional practices. Classroom observations were done weekly during the 45- minute sessions for each 4th and 5th period mathematics classes.

Records were kept of the observations as field notes. Patton (2002) advises that "field notes include the observer's own feelings, reaction to the experience, and reflections about the personal meaning and significance of what has been observed" (p. 303). By recording these reactions while in the field, the researcher can capture the intensity within the context of the event immediately without having to rely on memory after the fact. Hatch (2002) informs that such protocol helps "to keep track of impressions and preliminary interpretations that go beyond the descriptions reserved for the field-note record" (p.77). According Patton (2002), "In that field notes consist of descriptions of what is being experienced and observed, quotations from the people observed, and field generated insights and interpretations, they serve as the fundamental database for constructing case studies" (p. 305). Promptly writing up the field notes and keeping a research journal as well, afforded me the opportunity to reflect on the observation experience.

Interviewing. According to Patton (2002), qualitative interviewing begins with the assumption that the perspective of others is meaningful, knowable, and able to be made explicit. Thus, we interview to determine what is in or on someone else's mind, to gather their stories. In qualitative inquiry one of the things the inquiry is trying to determine is what dimensions, themes, and images/words people use among themselves to describe their feelings, thoughts, and experiences (p. 341).

Thus, to facilitate the analysis process before it actually begins, it is necessary that clarity of questions is adhered to when designing the interview questions. In keeping with the nature of qualitative data collection, questions must be open-ended during interviews so respondents can answer in their own words. Such is the case with this research study exploring what this African American male mathematics teacher perceives his capabilities to be working to move his students to proficiency, especially his under-achieving African American male students.

Interviewing the research participant in a qualitative study requires using or keenly developing listening skills in order to discover through conversations, the interviewee's perspective. Hatch (2002) informs that interviews provide a means for uncovering the "meaning structures" that may be hidden from direct observation and taken for granted by participants (p. 91). Interviews were both formal and informal utilizing an interview guide to maintain the focus for the interview. Permission was asked of the research participant to digitally record his interviews with the interviews being transcribed in a timely manner, recognizing that the data analysis process begins with data collection.

Documents. The final type of data collection strategy was the use of document data obtained from students work, teachers lesson plans, curriculum guides, learning plans, parent letters, school administrative memos, teacher evaluations, and other such documents. As Hatch (2002) notes, “Documents are powerful indicators of the value systems operating within institutions” (p. 117). These types of documents provide the researcher with rich sources of information not necessarily available in observations or interviews. As Hatch (2002) explains, they “tell their own story” independent of the interpretations of participants and can be gathered without disturbing the natural flow of human activity. Merriam (2009) offers that because documents “exist independent of the research agenda, they are nonreactive, that is, unaffected by the research process” (p. 156). She further cautions that using documents in isolation and not considering the context in which the documents were produced are areas for potential problems.

Unobtrusive data collection, such as records kept, is another resource that can serve as a prompt in the interviewing process by stimulating participant reflection and interpretation. Hatch (2002) adds that in both formal and informal interviews, asking participants to talk about how they use certain artifacts (e.g., getting teachers to talk about textbooks, bulletin boards, plan books) can get at important dimensions of school life. Collection of such documents is very pertinent to this case study in investigating the veteran teacher’s efficacy in moving his under-achieving students along the continuum to mathematics proficiency. Having access to items such as lesson plan and grade books, classroom tools, curriculum guides, teacher evaluations and student work, can serve as

physical evidence of how participants operate in their settings (Hatch, 2002, p. 117). For this descriptive case study, these items were part of the data collection investigated.

Qualitative research is particularly interested in how individuals understand the social circumstances in which they operate and asking the research participant to reflect on their experiences can offer an additional perspective that is even more telling (Hatch, 2002). Consequently, participant journaling can be another useful data collection strategy. According to Hatch (2002), there are several strengths to participant journaling: “They provide a direct path into the insights of the participant; the flexibility of entries made is at the discretion of the participant; and the usefulness of the journal data can guide the direction of other data collection methods” (p. 141). The African American mathematics teacher was asked to keep a personal journal once or twice a week to capture his thoughts and any epiphany moments experienced. For example, he may have had to re-evaluate his thinking regarding his explanation of a mathematical concept or capture a breakthrough with a student who has finally grasped a complex idea. Such reflections can assist in providing meaningful insights into the research participant’s perspective of his sense of teacher efficacy.

The objective in both qualitative and quantitative research is to ensure validity in the findings. Merriam (2009) affirms that “validity and reliability are concerns that can be approached through careful attention to a study’s conceptualization and the way in which the data are collected, analyzed, and interpreted, and the way the findings are presented” (p. 210). The research scholar further acknowledges that qualitative research assumes that:

Reality is constructed, multidimensional, and ever-changing; there is no such thing as a single, immutable reality waiting to be observed and measured. Rather, there are interpretations of reality; in a sense the researcher offers his or her interpretation of someone else's interpretation of reality. (pp. 213-214)

As the researcher conducting this study, I was very mindful of the role I was playing in delivering the interpretations by making sure personal biases are expressed and separated out in the observation and interview protocol forms.

Trustworthiness in qualitative research is enhanced by doing a member check of the interviews or observations conducted during the study. Referring back to the participant to determine if the meaning of his words or actions was accurate or sounded correct achieved the goal of member check. Merriam (2009) advises that “while you may have used different words, participants should be able to recognize their experience in your interpretation or suggest some fine-tuning to better capture their perspectives” (p. 217). This practice was utilized in the case study for interviews with the research participant. As another means of ensuring validity, Creswell (2007) offers the use of triangulation as a “process corroborating evidence from different sources to shed light on a theme or perspective” (p. 208). By utilizing the strategies presented here and making a conscious effort to clarify researcher biases from the onset, the foundation was laid to begin the process of data analysis.

Data Analysis

An understanding of data analysis from a qualitative research approach involves procedures and strategies that “consist of preparing and organizing the data for analysis, then

reducing the data into themes through the process of coding and condensing the codes, and finally representing the data in figures, tables or discussion” (Creswell, 2007, p. 149). Even though this explanation condenses the process of data analysis, it is much more complex: “Analysis means organizing and interrogating data in ways that allow researchers to see patterns, identify themes, discover relationships, develop explanations, mount critiques, or generate theories” (Hatch, 2002, p. 148). Consequently, there are different strategies for data analysis suited to the various types of qualitative research methods. As a descriptive single-case study utilizing the data collection strategies of observations, interviews and document data, careful attention was given to the timeliness of summarizing field notes, transcribing interviews, and contextualizing data from document sources.

Data analysis begins during the data collection phase of the research study. Marshall and Rossman (2006) explained that “the researcher is guided by initial concepts and developing understandings that she shifts or modifies as she collects and analyzes the data” (p. 155). Creswell (2007) emphasized that “data collection, data analysis and report writing are not distinct steps, rather interrelated and simultaneously part of the research study” (p. 150). In keeping with recommended approaches offered by Creswell (2007) for case study analysis, detailed descriptions of the African American male teacher in his classroom environment, his interactions with his African American male students, and his self-reflections were analyzed to determine patterns and themes.

The system for managing and organizing the data involves coding, which is the process of designating abbreviated words or phrases to an aspect of the data to retrieve and

categorize as needed. Coding “captures the essence of the language-based or visual data” for analyzing and according to Saldana (2009) is the “transitional process between data collection and more extensive data analysis” (p. 3). As the process of coding begins to generate patterns and themes, categories for sorting begin to evolve. However, it is important to keep in mind that “coding is not merely a technical task...new understandings may well emerge” (Marshall & Rossman, 2009, p. 161). And as the coding process continues, interpretations begin to shape the analysis of the data. In qualitative research, the interpretation provides the research participant’s story to be told as the narrative that adds meaning to the data collected and analyzed. Patton (2002) further explains that “interpretation means attaching significance to what was found, making sense of the findings, offering explanations, drawing conclusions, extrapolating lessons, making inferences, considering meanings, and otherwise imposing order” (p. 480).

After determining the codes found in the data, Bogdan and Bilken (2007) relate that it is then important to establish categories, as these categories are an attempt to discover the usefulness of the categories created. These codes should encompass topics for which you have the most substantiation as well as topics you want to explore. In this case study investigating teacher efficacy of a veteran African American male mathematics teacher, those codes that are descriptive of his instructional practices and his attitude and behaviors. The attitudes and behaviors that he displayed while working with his students formed the list of codes frequently occurring in the data.

Patton (2002) defines rich or thick descriptions as the foundation for qualitative analysis and reporting. Therefore, it becomes imperative to separate description from interpretation in doing the data analysis. In doing so, the use of memoing assisted in differentiating between description and interpretation. Saldana (2009) adds the descriptor “analytic” to memoing because memos are data and can be analyzed as such. Saldana explains “the purpose of analytic memo writing is to document and reflect on: your coding process and code choices, how the process of inquiry is taking shape; and the emergent patterns, categories and subcategories, themes and concepts in your data (p. 32). This study explored teacher efficacy of a veteran teacher by providing in-depth descriptions through rich narratives detailing his experiences with underachieving African American male students and their transition to proficiency. Memoing, and including reflective and marginal remarks to field notes, was also used to provide richness in the data analyses.

Research Validity and Reliability

Throughout qualitative research there are many terms used synonymously to explain validity depending on the orientation of the study. Truthfulness, authenticity or trustworthiness have all been attributed to the explanation of validity in qualitative research. However, Creswell (2007) considers “validation to be an attempt to assess the ‘accuracy’ of the findings as best described by the researcher and the participants” (p. 206). Creswell further views validity as “a strength of qualitative research in that the account made through extensive time in the field, the detailed thick description and the closeness of the researcher to participants in the study all add to the accuracy of a study” (p. 207). Therefore, a major

objective of qualitative research is to determine truthfulness in the study as applied in the process of data collection and analysis. Several of the validation strategies offered by Creswell (2007) and others (Merriam, 2009; Patton, 2002) were part of this case study. These include prolonged engagement in the field, triangulation of data sources, rich description to establish credibility and clarifying researcher biases at the onset of the study. Such accepted strategies formed the basis for this research study investigating self-efficacy beliefs of an African American male mathematics teacher and his work with low-performing African American male students.

However, the question of sample size may pose concerns as it relates to validity and reliability in a qualitative research. Therefore, it is important to clarify how a single sample can maintain rigor necessary for trustworthiness in this study. Merriam (1995) attests that “the trustworthiness of the findings of a study with a small N and no random sampling are dependent upon the internal validity, reliability and external validity of the study” (p. 59). She frames these three constructs as aspects of rigor, however cautions that both validity and reliability should be “grounded in the worldview of qualitative research,” instead of viewed from a quantitative research perspective. One of the qualitative perspectives offered by Merriam (1995) relevant to this study is “understanding how participants perceive their role or task in an organization” (p. 52). In this case, the perceptions held by the study participant give voice to the interpretation of his lived reality and may incur several facets or levels of understanding.

Consequently, as the interpreter of this reality, it is imperative that the researcher is mindful of the lens through which information is filtered. Thus, Merriam (2009) concludes, “Because human beings are the primary instrument of data collection and analysis in qualitative research, interpretations of reality are accessed directly through their observations and interviews” (p. 214). Therefore, the notion of reality and how it is constructed is better served by the researcher employing strategies offered by Merriam (1995) such as member checks, triangulation, peer/colleague examination, statement of researcher’s experiences, assumptions and biases and adequate engagement in data collection to strengthen internal validity (p 55). Using member checks with the study participant during data analysis, including researchers experiences and biases, triangulating various sources of data and soliciting feedback from colleagues were the strategies employed for internal validity.

Reliability in qualitative research refers to the standards adhered to in the process of collecting data from the various sources. Yin (2009) asserts that “the goal of reliability is to minimize the errors and biases in a study” (p. 45). In order to assure the margin of error is kept to a minimum and that the study can be done by other researchers, documentation of the steps or procedures followed during the research study must be established as protocol. In addition to those strategies mentioned earlier for internal validity, Merriam (2009) offers the use of an “audit trail” as an approach to ensure results are consistent with the data collected:

An audit trail in a qualitative study describes in detail how data were collected, how categories were derived and how decisions were made throughout the inquiry. In order to construct this trail, the researcher must keep a research journal or record

memos on the process of conducting the research as it is being undertaken....

Essentially it is a detailed account of how the study was conducted and how the data were analyzed. (p. 223)

As a measure to ensure reliability, the researcher recorded memos and noted reflections, issues and ideas as encountered during the data collection and data analysis process.

External validity is offered as the third indicator of rigor for an N of 1 research study. Merriam (2009) explains external validity as the extent to which the findings of a study can be applied to other situations or whether it is generalizable (p. 223). Unlike quantitative research where generalities are made from a sample of the population to represent the larger population, the notion of generalization in qualitative research has a more focused implication. Merriam (2009) posits, "In qualitative research, a single case or small, nonrandom, purposeful sample is selected precisely because the researcher wishes to understand the particular in depth, not to find out what is generally true of the many...the idea that the general resides in the particular, that we can extract a universal from the particular" (pp. 224-226). Several of the strategies offered to insure external validity utilized for this study included thick descriptions and attention to the perspectives of the study participant. By providing rich details to the strategies and perceptions held by the study participant working with his underperforming African American male students-the particular, other teachers working with challenging students-the general, can gain additional insights that may be applicable to their situations.

Finally, care was taken in providing high quality recording by using a digital voice recorder that was in excellent working condition for interviews. Once the data was recorded, it was downloaded on to compact discs (CDs) and transcribed. An observation protocol form was developed to capture descriptive and reflective notes as well as the physical and social setting during observations. Document summary forms were also utilized to assist in summarizing documents gathered during data collection to describe in detail the document and its contents. These document summary forms can be found in the appendix.

Ethical Issues (IRB)

A major concern for any research endeavor is based upon ethical actions on the part of the researcher and his or her interactions with the participants. Shank (2002) emphasizes that “a good researcher is an ethical researcher and becoming an ethical researcher is a lifelong learning process” (p. 97). That process actually begins with permission to access the site of the study and those individuals who will be involved in the study. Consequently, permission in the form of consent letters to the district superintendent and principal were written to acquire entry into the educational setting. Additional consent was also asked on behalf of the participant in the study, making sure his rights and anonymity are protected. Copies of consent letters and the Institutional Review Board (IRB) forms are available. (see Appendix B) In keeping with various components outlined on the IRB forms, attention was given to detail regarding procedures as they relate to the research study.

Limitation of the Study

There are certain limitations unique to this research study. The sample selection of an individual teacher with experience in working with diverse students and particularly underachieving African American males is intentional and deliberate. First year or novice mathematics teachers were not under consideration for this research study nor were women mathematics teachers.

The availability of African American men who teach in public schools provides a very limited database of individuals to study. This research study was a descriptive case study investigating an experienced African American male mathematics teacher to explore what he perceived his capabilities in augmenting academic proficiency for his diverse students, namely the African American male students. African American males are identified as one of the subgroups consistently found to be underachieving in both reading and mathematics. Having the opportunity to investigate an experienced mathematics teacher who happens to be male and African American provides a unique focus into the learning environment where gender and race converge.

This single case study was focused on a veteran male mathematics teacher to determine his teacher efficacy in working to move his under-achieving African American male students along the continuum to proficiency. He was selected based on his content knowledge of mathematics and the growing number of students who enrolled in algebra in the middle-school grades. Recognized not only as a highly qualified teacher, but also as a

highly effective teacher, he came recommended by the school administration and many of his colleagues as a master teacher.

Summary of the Chapter

This qualitative research study investigated the instructional practices of an African American mathematics teacher to determine his perception of teacher efficacy in working with under-achieving African American male students. How he instructs and what he perceives as his capabilities in moving his students toward proficiency was documented through data collection and data analysis in the form of classroom observations, interviews, and documents gathering. As a descriptive single case study, the research was conducted in a large school district in Wake County where ethnic and racial diversity is rapidly growing with minimal diversity reflected in the teaching staff. As an experienced African American male mathematics teacher in a middle school, his instructional practices with African American male students is worthy of study for teachers preparing to work in public education and with African American students, particularly African American males students as preparation for success in secondary education and post-secondary education.

According to Woolfolk and Hoy (2001), teachers' beliefs of personal efficacy affect their instructional activities and their orientation toward the educational process. For this single case study, investigating an African American male teacher's approaches to moving his African American male students toward proficiency can offer insights for both novice and veteran teachers who are concerned and committed to improving the teaching and learning experiences of all under-achieving students.

Given the richness of data collected for this study, the data analysis yielded descriptively which instructional practices were used by this experienced mathematics teacher and provided the dynamics operating in the dimensions of his sense of teacher efficacy. Chapter 4 presents detailed key findings of the instructional practices and the perceptions held by the research participant of his capabilities in moving his African American males toward proficiency in middle-school mathematics.

Chapter 4: Findings

This chapter presents the background and teaching practices of an African American male mathematics teacher captured as the result of classroom observations, in-depth interviews and document analysis gathered for this descriptive single case study. According to Marshall and Rossman (2006), the most compelling argument emphasizes the unique strengths of the genre for research that is exploratory or descriptive, that accepts the value of context setting, and that search for deeper understanding of the participants' lived experiences of the phenomenon under study (p. 53). Thus, the focus was on a primary participant to determine his instructional strategies and to investigate what he perceived as his capabilities in working with African American male students who are underachieving in mathematics. Set in a contemporary middle school setting, in a large southeastern school district where poverty levels are held to approximately forty to forty-five percent within schools throughout the district, this study investigated practices and personal perceptions of the study participant. Experience was a prerequisite, therefore beginning and novice teachers along with female teachers were excluded from this study. There was deliberate intention to investigate a male teacher given the miniscule presence of men, particularly African American men in the teaching profession and the growing subgroup of students who are not proficient in mathematics, namely African American male students.

Claude B'right agreed to participate in the descriptive case study as the primary research respondent investigating his instructional practices and the perception he has of his ability to work with students who are struggling in mathematics. Pseudonyms were used for

himself, the school, the principal and the former student-teacher to protect their identities. He expressed his hopes that the information gathered from the study would be useful and adaptive for teachers, especially novice teachers beginning in the profession.

As a former teacher myself, I was frequently reminded of the classroom experiences and the dynamics of student engagement. Therefore, cognizant that my own personal experiences and that biases may interface during the process of data collection I adopted the use of memoing to record my thoughts or recollections. Saldana (2009) compares memos to a journal the researcher may keep to “dump your brain” about the participants, phenomenon, or process under investigation (p.31). Utilizing this technique proved helpful in understanding and analyzing my thoughts about what I was observing or interviewing during the study.

The study participant was selected for his reputation as an effective teacher in middle school mathematics, his years of experience, his race and his gender. The selection process for determining the participant was criterion-based in which purposeful sampling was done to attain rich description. Merriam (2009) attests that, “The criteria you establish for purposeful sampling directly reflect the purpose of the study and guide in the identification of information-rich cases” (p. 78). Given the limited presence of African American men as teachers and the prevailing number African American male students who are not proficient in mathematics, this qualitative study posed the following research questions:

1. What are the instructional practices of an experienced African American male mathematics teacher?

2. What does he perceive as his capabilities in augmenting academic proficiency for his African American male students?

These research questions were instrumental in guiding classroom observations and developing interview questions. Consequently, they will frame the organization for this chapter. The specific demographic information for the study participant is summarized in Table 4.1 and presents the criteria for his selection.

Table 4.1
Participant Demographics

Criteria	Identification
Gender	Male
Race/ethnicity	African American
Teaching experience	20 years
Age	45 years
Profession	Certified, licensed secondary mathematics teacher
Reputation	Exemplary teacher

Note. Study participant's reputation is determined by teacher evaluations, content knowledge of subject matter, leadership role in the school, student performance on summative and formative assessments, and parent commendations and referrals.

As a career teacher certified and licensed in secondary mathematics, he has gained the reputation as an effective teacher from school administrators, parents and colleagues.

Classroom observations, interviews, and document reviews were all facilitated at the middle school to accommodate the study participant and his full teaching schedule. His work day began at 7:15 AM and lasted until 6:00 PM. The instructional observations comprised two or more periods with all classes at the middle school held 45 minutes each. A school day for teachers and students extended to eight periods including lunch. Observational protocol used to record data is found in the appendix. Interviews were conducted face-to-face usually in the mathematics classroom or in the principal's office. Occasionally, a few early morning interviews were conducted before class during the participant's bus duty or the end of school after he had coordinated the afterschool program at the designated location on the school campus. Interviews were conducted in-person for approximately ninety minutes. A total of twenty-three observations and fourteen interviews including the principal, a former student-teacher and the study participant were conducted (See appendix C, D, and E). Documents were acquired from the study participant and the principal. A document summary sheet was utilized to detail the contents of the various documents obtained (See appendix D).

Research findings are organized into three areas: the participant profile, a brief overview of algebra in the middle school and the findings determined by the research questions and the themes that emerged as the result of this qualitative study. Given this research is a descriptive case study with a single study participant, attention was given to the participant profile to provide as much in depth background and context for who and what has

shaped this teacher. Every effort has been made to advance the voice of the participants so as to “reveal them in their complexity rather than reducing them to simple explanation”

(Wolcott, 2001, p.36). Additionally, an understanding of the current focus to include

Algebra in middle school mathematics curriculum provides the context for investigation of instructional practices and teacher efficacy of the study participant.

Participant Profile

In an effort to gather rich descriptive information about this participant, the study begins with a participant profile provided through the use of observations and interviews and document analysis. Descriptive reporting is achieved through advancing the voice of the participant and others who have worked with him. They include the principal and a former student teacher. The profile highlights the study participant's background, his early professional career teaching secondary mathematics, his philosophy of education, his middle school teaching experiences and his recent assignment teaching Algebra in middle school.

Background

Claude B'right is the pseudonym given to the male mathematics teacher who is a veteran teacher of secondary mathematics at DePaul Middle School in a large school district in central North Carolina. He is an African American male who grew up in the south and attained his elementary and secondary education in the school district he now teaches. He is an only child whose parents worked together to rear him to be productive and self-reliant. He grew up in the 1970s during a time when people were still sharecropping the farm land in rural parts of the state. However, Mr. B'right credits the hard work of his grandfather in setting the example for his parents and other members of his family by working long hours and hard enough to save their earnings to purchase the land they had farmed. "Instead of sharecropping, like many others during the late 1930s and 1940s, my grandfather bought his own land. Owning your own land was big back then and you had your own stuff,"

emphasized Mr. B'right. That stuff, he added, "Included all of the vegetables and fruits you and your neighbors needed to eat and share with each other."

"My parents were able to also buy their plot of land, about 17 acres and build a brick home on the home place," proudly explains Mr. B'right. He fondly remembers his early days as those of having "freedom, opportunity and lots of stuff," living on the land. He explained that freedom was the ability to walk the land and have everything you needed without having to ask anyone for anything. The opportunity he spoke of was being able to learn to drive trucks and tractors on the home place and learn how to fix machines and other things needed to operate the farm. Living within close proximity of his grandparents also played an important role in his development because during the day when his parents were working he was in the company of his grandfather, who had a very strong work ethic. Both his father and grandfather always worked to fix things and rebuild many of the machinery items, thus he learned to be handy as well. "I remember once my father ordered a motor from Sears and Roebuck, that's what they called it when I was growing up. He fixed my grandfather's car in a day. Back then you could order most anything. My father was very good with his hands," explained Mr. B'right. That skill of handiness is prevalent in his classroom where there are electronic kits and gadgets he uses and has available for student use making connections between mathematics and science.

His mother was an elementary school teacher and his father worked the night shift at a local bakery. He considered his parents as "working class people," who placed a high value on education. They each assumed specific roles when it came to his educational

upbringing. His father was the disciplinarian who required him to pay attention and not misbehave in class. Mr. B'right chided that his Dad would intentionally play Bobby Womack's *Harry Hippy* song. When asked why that rhythm and blues song, he explained, "The message was you don't want to be like *Harry Hippy*, someone wondering around, with no aim or purpose in life. My Dad didn't say much, rather he let the words and messages of others get across to you." There was a congruent effort by both parents to keep education as the goal for their son.

His mother was relegated to keep close watch over his school work and monitor his progress. Both his mother and grandmother fulfilled the role of teachers. "I can remember some older church members telling me that even my grandmother was a teacher for some of the older folks in the early 1900s. She believed in learning and taught them their figures," the elder members would explain. His grandmother was not a formal teacher but she served in the capacity of the Sunday school teacher at their church. He inherited the legacy of his grandmother and also his mother as teachers in the community he lived. Mr. B'right chuckled, "Having a mother as a teacher helped me model those behaviors I guess. She taught elementary school for 40 plus years in the state of North Carolina, 30 years here in this district."

While in high school Mr. B'right had a keen interest in physics and did well in his physics' class. "I was a very good physics student. Loved designing stuff and putting stuff together and enjoyed the classes, Physics I and Physics II." As a result, he was motivated to

continue his post secondary education and considered majoring in physics upon attending college.

“There was no question about college, I knew I was going and that was the expectation. My parents were adamant about that,” exclaimed Mr. B’right. Consequently, he attended North Carolina Agricultural and Technology State University, a predominately African American University in Greensboro, North Carolina during the late 1970s. After several years in college and at a point of needing to declare a major, Mr. B’right was contemplating whether a major in physics would serve him well enough in a career. He realized he had a number of math credits that could be carried over into a math major and weighed the possibility. “I always knew I could explain things, and at the end, people were able to understand, so I looked at that (mathematics) as being an option,” conveyed Mr. B’right. With the help of an advisor he made a conscious decision to declare mathematics education as a major. He took that advice and with the support of mentors in college, he did well and graduated. “I had good mentors there in college who showed if you are going to be a good instructor, you must know your subject matter and whatever you do it must be accurate. We’re not going to practice going back, working out a problem, getting five or ten steps into the problem and then having to erase and start all over again, this is what they emulated,” reflected Mr. B’right. Thus, the name his students have dubbed him, Mr. B’right (pronounced be-right) is appropriate. He emphasizes that he practices what he was taught from college and puts forth every effort to know his subject matter very well and also stay abreast of current trends. He does so by taking advantage of professional development

opportunities and his active participation with the National Council of Teachers of Mathematics of which he has been a member for two decades.

Professional Career

As a veteran teacher of 20 years, Mr. B'right began his career as a high school mathematics teacher in the school system for 2 years. He explained that during his early years coming into the profession, the enrollment of students was not high enough at that time for him to have a permanent teaching position in mathematics education. However, during the early years Mr. B'right spoke of his stint at the high school.

I had some interesting experiences at one of the high schools. I think they liked the quality of work that I was doing and it was good enough where they said we want you, Mr. B'right to remediate all the kids who have not done well. We'll take all the kids out of your class that passed and give you all the students in everybody else's class that did not pass in the school for you to remediate. This lasted for the end of the semester, well into the summer. I feel I did some good and wanted to be an example and help the students gain mastery.

However, coming into his third year in the profession, Mr. B'right was seeking more permanent placement in the system. Having a family to support provided the added incentive to pursue a more stable teaching position. Thus, when a teaching position did become available at the middle school, he readily accepted. He explained,

Keep in mind, my teaching certification is for secondary mathematics and that includes both middle grades and high school grades. Math is math and teaching is a

kind of relative thing. What it takes for a six grader to learn if it's brand new, is probably the same thing it takes for a high school or college student to learn. It is the same pedagogy and that is to be sure the folks understand it.

During his tenure at the middle school, Mr. B'right has taught 6th, 7th and 8th grade mathematics to students who now have their children in his mathematics class. His reputation precedes him and some parents request him as their child's teacher. According to the principal,

The parents love him. I had a sixth grade mom who came in with her son and she said, "I want Mr. B'right to teach my son, he's a little bit challenged." When the parent found out Mr. B'right had been assigned this year to only eighth grade math classes she responded, "I can't believe my son doesn't have Mr. B'right. That's why I wanted him to come to De Paul because I knew he would straighten him out. Man! I've got to wait three years for this boy to be straightened out?"

Such sentiments were echoed by parents, former students and teachers alike who knew or who had worked with the study participant over the years.

A former student-teacher who now teaches mathematics at the middle school expressed what it was like having Mr. B'right as the supporting teacher during his term as the student- teacher in his class the previous year. As a new teacher, Mr. Bellinger, reflected that the anxiety he initially felt as a Caucasian teacher, was calmed after working with Mr. B'right because of the way he taught his classes and treated the students. "He calls all his students Mr. and Ms. by their last names and is fair and consistent, no biases or prejudices,"

reported Mr. Bellinger. He further commented that his student-teaching experience with Mr. B'right has influenced how he teaches his class. "He never had discipline problems in his class because of the relationships he built with them (students) and their parents. Instead of giving homework, I refer to what Mr. B'right called ESO- extended skill opportunities. These are some of the things I have taken from his influence," explains Mr. Bellinger.

Currently, Mr. B'right assumes other non-teaching duties within the athletic arena of his middle school. They include assistant football coach and assistant basketball coach for the girls and boys basketball teams. Serving as a coach and mentor for his students, particularly the African American male students, gives him frequent interaction with his students outside the classroom and thus facilitates deeper relationship bonds forged in the classroom. He also participates as an instructor in the Math-Science Education Network program (MSEN).

When I first started teaching I became part of a program called the MSEN pre-college program. It was designed to increase the number of African American students in the areas of math and science. If you take Calculus in twelfth grade, you work your way backward to see what you need to be taking in middle school. And you know it says that you need to be completing at least Algebra I, if you're going to make it to that level of mathematics. So with that approach, we looked at our kids and we realized the goal is for them (eighth graders) to be in Algebra I.

He has been working with the program over the past twenty years, teaching the mathematics portion of the curriculum developed at North Carolina State University and presently teaches MSEN as a mathematics elective course at the middle school.

His leadership skills are utilized as the coordinator of the 21st Century After-School Program that he administers for middle school students in mathematics and reading. Approximately 60 – 70 students are enrolled in the program daily after school where they are provided additional skill enhancements in reading and math by certified teachers in those respective areas. Mr. B’right adds that engaging activities and fieldtrips are utilized to make the experience relevant for the students.

Over the course of his teaching career, Mr. B’right has received several Teacher-of-the-Year awards and offers to move into school administration. Instead, he has remained in the classroom as his viable choice. He attests that it has been his primary goal to engage and impact students in a way that promotes an attitude for them to try and try again until they succeed.

Personal Philosophy of Education

After two decades in the teaching profession Mr. B’right summarizes his philosophy of education as “all kids **DO** learn and never let them **QUIT**.” As simplistic as the phrase may sound the motivation for his philosophy came from an experience he had during his fourth year of teaching. He explained that once he was asked to work in an afterschool program with a group of students. Former Governor Hunt was on the premise tutoring a student at the middle school and he inquired about me. “He (the governor) asked me, young

man, how are you and what are you doing?” Mr. B’right responded, “I am working with some kids after school.” The governor said, “I saw you doing some math, do you mind working with some of my kids?” The conversation pursued with Governor Hunt and Mr. B’right discussing student learning and he found his philosophy was very much aligned to that of the governor. However, instead of every kid can learn, Mr. B’right posits that “all kids do learn” and that learning can be either positive or negative depending on the circumstance. Over the years, Governor James B. Hunt has been recognized as ‘the education governor’ for North Carolina and this encounter with the governor offering his time tutoring students can serve to attest to his commitment to education.

Mr. B’right further adds that the other part of his philosophy is “never let the students quit.” He cites how easy it is to allow the circumstances many of the students find themselves, to become roadblocks for learning, and cautions that,

Sometimes we (teachers) put up barriers and say by this time the student should have done this, like it’s a rite of passage. It’s too easy sometimes for teachers to say, he (the student) says he doesn’t care and take the attitude- *well have a good life*. At twelve or thirteen years old, it’s too soon for the student to quit. He doesn’t know nor has he had enough experiences to know what’s in his best interest. So you do all you can while that student is in your class to take away the excuses.

Mr. B’right is keenly aware of the thought processes of many of his African American male students and attests to the fact that he is part of that subgroup that is often found to come to school with the attitude that sometimes sabotages their academic progress. “Some of these

young men have learned things from their environments that may be negative or even inappropriate at certain times,” laments Mr. B’right. However, he believes and is committed to making the lesson and experiences in his mathematics classes relative to the learner to add more positive learning to the students’ academic life while in school. Could it be his role as an African American teacher and father of African American school-age sons provides another layer of sensitivity to the unique needs of these students, thus motivating him to keep trying?

Middle School Mathematics Teaching Experience

In the eighteen years as a middle school mathematics teacher Mr. B’right has taught students in grades 6 – 8 mathematics. These include either core or elective mathematics classes. His teaching assignments have been six grade math, Pre-algebra, Algebra 1, Geometry, and Algebra 2. For those students who are interested in mathematics as an elective, he teaches pre-college mathematics and electronics, and SAT mathematics preparatory classes for a mixed class of 6th, 7th, and 8th grade students. The higher level mathematics classes such as Algebra I and Geometry are high school credit mathematics classes taught at the middle school for ages 11 – 13. He believes that if you want a student to be ready for college you begin with the end in mind and work backward from what the student needs in college to where the student is in middle school. Mr. B’right contends that he is better suited to help students make the transition to high school mathematics through the preparation they receive in middle school.

DePaul Middle School is a magnet school which operates a 45-minutes class schedule throughout the day, therefore the pace is swift and high energy. From observations of his classes, students are expected to come in quickly prepared for work, which means having their tools accessible and ready to engage the lesson. Pulling out their planners, recording the date for an upcoming quiz or making note of an *extended skill opportunities- ESO* (phrase used instead of homework) is one of the classroom protocols one can expect on a regular basis. Combining wit and a little humor with his instruction, Mr. B'right presents concepts in a relevant and sometimes fun manner. Even during his lunch period, which he refers to as *Smart Lunch*, students are able to come in and get additional help or make up a quiz if needed.

Mathematics instruction extends beyond the classroom for Mr. B'right into the weekends as he can be found conducting math classes on Saturdays at North Carolina State University in their Math Science Education Network program (MSEN). According to Mr. B'right, "It was a program that was designed to increase the number of African American students in the areas of math and science. The STEM word hadn't come out with technology and the engineering yet, but they focused on the math, science and engineering." It has been a twenty year project for Mr. B'right with the goal of having eighth grade students taking Algebra1 before leaving middle school. When asked to evaluate whether the program has worked he reflects:

Now here it is some twenty years later and it is pretty much the norm, at least here in this area that we expect to get as many of our kids...receiving that high school

algebra credit before they leave middle school. Well when you look at numbers, are there more African American students taking algebra? Yes. Is it enough? No. I think we can probably do a better job.

The pre-college elective he teaches has a similar objective in reaching African American students and providing the support that is needed to be on track with mathematics requirements including Algebra in middle school. His aim is to prepare his students for higher level mathematics courses in secondary and post-secondary education.

Algebra in the Middle School

Historically, Algebra has been considered a mathematics course for high school. Yet, within the past twenty years, emphasis has shifted to including Algebra into the middle school curriculum and preparing students earlier with algebraic concepts. When compared to other developed countries, the United States has lagged behind in mathematics. In a report produced by the National Mathematics Advisory Panel (2008), the skills and concepts of the highest performing countries (Singapore, Japan, Korea, Hong Kong, Flemish Belgium and the Czech Republic) were significantly different in comparison to the skills taught American students. The Trends in Mathematics and Science Study (TIMSS) is a mathematics examination given to fourth, eighth and twelfth grade students internationally. Results from the third TIMSS (1999) reported U. S. fourth grade students performed above average, however, U. S. eighth grade students performed below average and U. S. twelfth grade students performed even less proficiently. Thus, these findings and other research studies (NAEP, 2008 and PISA, 2007) have prompted educators and politicians to express concerns

regarding mathematics literacy and consider ways to add rigor to the mathematics curriculum.

As a result, emphasis to strengthen the teaching and learning of mathematics and make it more challenging have included incorporating algebraic thinking in elementary schools and preparing students to complete algebra during their tenure in middle school. This initiative has fostered debate by some educators who contend that middle school students are not developmentally ready for algebra concepts and believe that the necessary mathematic skills are missed by advancing this mandate. Even though some educators do not agree, there is a growing trend by policy makers to advance more preparation for students to take algebra prior to high school with the hopes of increasing the pipeline for career and college ready students.

Simultaneously, a closer examination of underachieving students and their need to acquire proficiency in mathematics has become an issue for school administrators and teachers as they begin to consider viable solutions. According to Silver and others (1997) in *Mathematics Equals Opportunity*, “Students from low-income backgrounds who take rigorous math and science courses are three times more likely to go to college than similar students who take less demanding courses” (p. 12). Although, referenced as the “gateway” to higher education after secondary schooling, mathematics courses for many disadvantaged students does not include higher level mathematics such as algebra or geometry. “Moreover, there are large, persistent disparities in mathematics achievement related to race and income-disparities that are not only devastating for individuals and families but also project poorly

for the nation's future..." (The National Mathematics Advisory Council, 2008, p.4). Given the growing concern from a national perspective that American students are prepared with twenty-first century skills, that include problem solving derived from higher level mathematics concepts, the push in favor of algebra by eighth grade has gained momentum.

A North Carolina-based company, SAS Institute has taken the lead in developing educational technology that assesses student progress and has the ability to predict student performance in major core subjects. Recognized for its innovation in technology internationally, SAS has offered to any local education agency within the United States the software SAS® EVAAS®, an educational value-added system free of charge. It was created in 1992 and is currently used in several states including North Carolina. Two of its guiding principles addressing student progress and achievement and measure educational effectiveness are to

- Maximize academic growth opportunities by assessing individual students' probability for future success at multiple academic milestones to allow for more customized, proactive planning for all students and
- Provide trajectories for individual student progress toward critical academic benchmark (<http://www.achieve.org/BenchmarkingforSuccess>).

School districts such as the one for which this research study was derived are also beginning to utilize the data from SAS EVAAS as a means to increase the number of under-represented students taking higher level mathematic courses in middle school. SAS EVAAS reported in one of their case studies, only 44 percent of seventh graders likely to be successful in eighth

grade algebra were actually enrolled in the course as eighth graders and this figure was lower for minority students (www.achieve.org/BenchmarkingforSuccess). Having a resource tool such as this provides both principals and teachers with the knowledge and understanding of their students from an objective measure.

The principal from De Paul Middle School made a conscious decision to enroll a significant number of students into higher level mathematics who would not normally take Pre-Algebra or Algebra courses based on their End-of-Grade state tests results. For all the students in her school who scored either Level I and Level II (non-proficient) on the state Mathematics End-of Grade test, she reviewed the trend data provided by SAS EVAAS documents, to determine the trajectory for those students as measured over a three-year period in mathematics. Instead of relying on teacher recommendations as a major consideration for access into a higher level mathematics course, a more objective measurement provided valuable information for consideration. Principal Ingrid Dunston explains:

One of the things I like about EVAAS is that it takes that piece out, where folks look at a kid and they might not have done well in class and the teachers might not have recommended this kid for higher level math. But now, based on EVAAS documentation, there's a predictor score that indicates whether or not a student will be successful in Algebra I by the eighth grade, and so if they have 70% or higher (score), then they are to be placed in an Algebra I class here at De Paul.

What the principal found after disaggregating the data convinced her to modify the course offerings to include Pre- Algebra and Algebra I, for those students who would otherwise be excluded or not included on the teacher recommendation list.

In a middle school population of 1,100 students of which 60 percent are academically gifted and approximately 30 percent of the African American student population comes from the surrounding low-wealth neighborhood, the idea of using the EVAAS data did meet with resistance from some teachers. “One of the teachers expressed concern, that we’re setting those kids up for failure,” expressed Principal Dunston. In a reflective tone, Principal Dunston responded, “Well, that means Algebra I classes are looking a little bit different from what they used to be...it used to be the kids who were all generally bright. Now you see kids who are diverse in Algebra I.” As a result of using the SAS EVAAS data as a predictor in the school district, there are substantially more students enrolled. Cited in a local newspaper, enrollment was up 30 percent for students enrolled in middle school advanced mathematics classes using the new guidelines adopted by the district. According to the article, 10,313 middle school students are taking pre-algebra or Algebra I, an increase of 2,351 since the last fall term (www.news/observer.com, 3/15/2011).

As the instructional leader in the school setting, the principal has the arduous task of meeting the needs of all students to ensure each is growing academically and gaining proficiency as they matriculate through middle school. It is also the responsibility of the instructional leader to determine teacher effectiveness in working with students. Assigning a teacher to work with those students predicted by the EVAAS data, to have the likelihood of

success in Algebra, came without reservation. Explaining what she considered as her most important role in working with teachers, Principal Dunston articulated,

As complex as it may sound, the most important thing for me is to ensure is that my teachers are meeting the needs of all students. One of the things that I ask my department chairs to work on with their teachers is to look at students from two different vantage points: One is to look at those students who are doing well, because at De Paul we have students here who score at the 99th percentile. We have quite a few. So, I ask teachers to go through and make sure they are developing a plan for what you are going to do instructionally for those (gifted) students, so they won't just sit there and not make growth. Also, I ask them to look at those students who are struggling. I've shared EVAAS documentation with them so they know those students, identify them, ensure they have wraparound support for them, so they are making the appropriate growth and gains they need to grow.

Mathematics teacher Claude B'right, a seasoned veteran educator with twenty years of experience working with underachieving students as well as those students who are proficient and gifted, was selected by his principal, the assignment of working with the "EVAAS students" for the academic school year. He accepted his teaching assignment and welcomed the challenge and rewards of developing the instructional foundation for higher level mathematics with his newly assigned students. Not your typical students, those projected to have a 70% chance of success were referred to as "EVAAS students." Aware of the differences in the Algebra and mathematics curriculum and the concerns voiced by some

administrator colleagues and mathematics teachers, administrator Dunston recognized “the need to review grade level math and make sure the gaps are being covered because what will happen is, although a student is taking pre-algebra in seventh grade or Algebra in eighth grade, they are still required to take the eighth grade End-of-Grade test, which doesn’t sound like it; but there are some differences in the curriculums.” She felt assured Mr. B’right was capable of bridging the gap between the two mathematics curriculums.

Implementation of the districts initiative to increase the number of under-represented students enrolled in higher level mathematics courses in middle school provided an unexpected added lens for the context for this qualitative study. As the findings are presented and the research questions are answered, it is hoped the study provides deeper insights into instructional practices for teachers working with underachieving African American male students. Also, fosters discussions regarding the use of value added scores for determining teacher effectiveness.

Within data analysis are various approaches applicable to the respective qualitative research study. However, the two basic ones are inductive and comparative analysis strategy. For this study, the inductive analysis strategy was employed to provide richness to this descriptive case study and the comparative analysis allowed recurring themes to surface as categories of data. Merriam (2009) explains that some features in case study affect the data analysis. These features include information obtained from the observations, the interviews and the documents retrieved as field notes during the data collection process. Therefore, she emphasizes, “Conveying an understanding of the case is the paramount consideration in

analyzing the data” (p. 203). Following the suggested protocol offered by qualitative research scholars, I have sought to create a case record or database (Yin, 2009 and Patton, 2003) organized for access. In addition to the data obtained during the data collection process, I also included my own reflective notes or memos as part of the researcher’s voice for data analysis as well.

As represented in Table 4.2 in the Summary of Final Themes and Subthemes, there were seven reoccurring themes and fourteen subthemes that emerged within the data set for the first research question investigating the study participant’s instructional practices. For the second research question, four themes and three subthemes emerged determining the beliefs held by the study participant of his own abilities in teaching underachieving African American male students.

Instructional Practices

The first research question focused on investigating the instructional practices of the veteran African American male mathematics teacher. Classroom observations provided the researcher with the opportunity to witness instruction within the study participants’ learning environment. These experiences proved to be invaluable in capturing the nuances of student-teacher engagement as it unfolded. My presence in the physical setting of the mathematics classroom along with a semi-structured interview process, afforded me the ability to determine the frequency of instructional strategies from codes and themes that emerged from the data collected. Those instructional practices used by Mr. Claude B’right throughout the

research study included extended learning time, re-teaching, use of technology, frequent assessments, real-world references to mathematical concepts, humor, and lastly parents

Table 4.2
Summary of Final Themes and Subthemes

Research Question	Themes	Subthemes
1. What are the instructional practices of an experienced African American male mathematics teacher?	Extended learning time	Smart lunch After-school tutorial Saturday smart math
	Reteaching	Reviewing concepts not fully understood Presenting various approaches to concepts Teacher-made assessments
	Frequent assessments	Benchmark assessments Extra-credit quizzes
	Use of technology	Smart Boards and learning software Scrolling marquees Desktop and laptop computers
	Humor and other antics motivate students	Onus on the student Restore point Raise the bar
	Real world relevance to instruction	Use of props Valuing student experience
	Parent Connectivity	Evoke the parent

Table 4.2 (continued)

Research Question	Themes	Sub-Themes
2. What does he perceive as his capabilities in augmenting academic proficiency for his low performing African American male students?	Motivate students	Onus on the student Restore point Raise the bar
	Promote self-regulation of behaviors	
	Elucidate Mathematics	
	Remove roadblocks to learning	

are sub-themes that served to expand in more detail what the data analysis provided. One of the instructional practices captured as extended learning time, provided several instructional platforms students could access in conjunction with the regularly scheduled mathematics class. The strategy most frequently interwoven throughout the instructional delivery and student engagement process was parent connectivity. Frequent references to parents and the familiarity developed as a result of relationships built resonated in class discussions.

Extended Learning Time

The research participant, Mr. Claude B'right expressed the desire to be able to offer students who needed more time or further clarity relating to specific mathematics concepts, a chance to get that assistance from him within a timely manner. By making himself available either, daily, weekly or bi-weekly meant that students had access to him on a regular and consistent basis. Students could also self-regulate their levels of comprehension while gaining a sense of confidence or take advantage of incentives for the amount of extra effort they put in to the learning process. Those extended learning opportunities fostered by the research participant manifested as *Smart Lunch*, *Saturday Smart Math Sessions*, and *After School Program for Reading and Mathematics*.

Smart Lunch. Forty-five minute classes during the school day at DePaul Middle School were often fast-paced for most subjects. When considering higher level mathematics courses such as pre-Algebra or Algebra which traditionally were taken in high school, the need to extend the learning time for middle school students was a major concern addressed by the study participant. Scheduled as the same amount of time as a regular class (45 minutes), and named to entice students, *Smart Lunch* was an invitation extended to students to come during their lunch period to be tutored and receive extra help or extra-credit with their mathematics teacher. During the initial interview with the principal, the suggestion was made for me to visit his class during lunch time and see that his classroom is open for students to come back and have lunch with him and ask any question they may have, thus making himself accessible to his students.

According to Mr. B'right:

Smart Lunch is the time I make myself available to my students to come in for part of the period or the entire period to get extra help. It's called *Smart Lunch* because it's just that. They can grab lunch and come in here and spend it getting help with something they didn't understand or missed due to an absence. It's enough time to ask me a question, work out a few problems and get more clarity on something we did in class. It's built in the day for all my students to use.

During the lunch period, there were also other clubs or organizations that met occasionally and were vying for students to participate. Consequently, reminders were incorporated within instruction. These reminders were frequently referenced before the end of the class period where Mr. B'right would create his own commercial for *Smart Lunch*. For example, during a shortened period of 30 minutes, due to a school assembly, Mr. B'right reminded one of his African American students, "Come back to see me at *Smart Lunch* and I can give you more help graphing linear equations using the graphing calculator." He had noticed moving around the room, the student was having some difficulty maneuvering the function keys on the calculator during the guided practice in class. The challenge in getting those students who needed extra help into *Smart Lunch* was met purposefully with a direct invitation to some of Mr. B'right's African American male students instead of a general invitation to the class as a whole.

When questioned during an interview, the rational for offering extended learning time, Mr. B'right reflected back to one of his professors in college whom he recounted

believed in the mastery of learning. “Dr. Smith emphasized to us, we do it until we get it right,” recalled Mr. B’right. Not excusing time limits as an issue to be considered, however, the research participant offered his perspective in working with today’s middle school youth.

We are dealing with young people who at this point in time have all sorts of things going on in their life and we can give a little bit of leeway. I don’t know what went on Wednesday...what was going on Tuesday night when you were preparing for Wednesday. It could have been Bible Study. It could have been you had a basketball game. It could have been a sick relative. Your parents may have been working late and you were at grandma’s house. Maybe you were watching brothers or sisters or whatever. There are a lot of things... There are a lot of variables that impact a student. So if more time is needed we try to take that into consideration.

In addition to the extended learning time built into *Smart Lunch*, there is the observable rapport Mr. B’right has with his students that creates a climate of safety and security for some of their vulnerable feelings of not being proficient in the content area. His one-on-one approach with each student appears to ease those feelings of inadequacies. Also, his in depth content knowledge of the subject matter, allowed him to provide multiple-approaches to problem solving or building foundational understanding of a specific mathematics concept. During one of the observations, when interim-progress reports were disseminated to students, he explained that some of the grades were low because some students had not turned in work or had not done make up work. Mr. B’right offered as a reminder, “I am here during lunch

and you can come by for *Smart Lunch* to get help and do make up work.” The opportunity for additional tutoring was always made available.

After-school program. The after-school program is tutorial in its structure and is supported with a 21st Century grant made available through federal funding. Principal Ingrid Dunston, referred to the program during an interview when she was questioned regarding the intervention strategies in place to scaffold struggling students, particularly African American students who were not proficient in math. The school administrator informed me that Mr. B’right was the coordinator for the program and the leadership he provided was reaching students who had not achieved proficiency on the state End-of-Grade exam in reading and mathematics. According to Principal Dunston, “Some of our African American students do well making AYP (annual yearly progress) however, there are some whose numbers are low and we have been working here with interventions to help our African American students continually come up and make growth.” The afterschool program provides the needed support for those underperforming students.

Although this is not the only afterschool program Mr. B’right has been involved with during his tenure of teaching mathematics, he informed the intent of this afterschool program was more targeted.

In the previous programs I’ve had, it’s been kind of opened up for all students that want to come in, but in this one there was a particular focus group. We’re looking at students that scored levels one and two. We take recommendations from the teacher and she may refer a low level three student. After we go through all the one’s and

two's and exhaust all the possibilities, then we look at the low level three's. We realize, just by a couple of questions, the student could be a two again if they don't grow," explained Mr. B'right.

State performance measures are determined through an End-of-Grade (EOG) or an End-of-Course (EOC) test administered in all core subjects either at the end of the year or at the end of the semester. Students who are considered proficient or above, score levels three and four on the test. However, those students who are not proficient score levels one and two. The After-school program targets those students who are not proficient in mathematics and reading specifically with the goal, as attested by Mr. B'right, "To do everything we can to get them to score higher on the end of grade tests." For some of these students there are other equally important considerations that have to be addressed in conjunction with the teacher working to supplement instruction.

Sometimes with these students there are usually other issues that impact them academically. Mr. B'right explains there is an attitude adjustment that has to be done in some cases when working with some of these students. He iterates,

We want to get those zeroes off their interim report. But we're dealing with a group, that even after this short six or seven years of school, it's been okay to get a zero. When you say zero, it doesn't have the impact. It's not impactful enough, like zero doesn't take food off the plate, it doesn't take money out of my pocket. That type of thing.

Therefore, for Mr. B'right, the objective is to create a paradigm shift for students to see the impact of completing school work in a positive and supporting environment created in the After- school program. During an interview explaining some of the needs he and his staff are sensitive to as it relates to the students he serves in the After-school program, he contends emphatically,

What we want them to do is to see the impact of the zero and see what happens when an assignment is done. Now watch this, if you go in and get this assignment turned in and that teacher goes to the spreadsheet right then as soon as you submit that assignment and she makes whatever changes, your grade automatically goes up. Right now we're working with the small stuff not just the test scores. From point A to point B, an assignment is given to the student. You complete the assignment; you return the assignment to the teacher and do it continuously, then you become an active class participant. You're no longer looking out the window because guess what? You have your work here and you're waiting for your turn to answer the question.

For Mr. B'right there is an expectation for his students to make incremental gains that usually begins with the reinforcement of steps leading to consistency which in turn helps foster that shift in attitude he is desirous of seeing.

He makes use of the on-line program *Study Island*, which he purchased with his own personal funds to supplement guided instruction and practice for the afterschool program and his regular mathematics and algebra classes. His preference for this program is two-fold

because it allows him to monitor his students and it provides accessibility to his students beyond the school hours. He iterated during my observation of the program housed in the media center, “I’ve just gotten all the codes so everyone in the program will have this particular account where they’ll be able to work online and we’ll be able to monitor their progress on the different things for language arts and the mathematics. They’ll have access anywhere they go... Grandma’s house, the library, or here at school.” His enthusiasm radiated as he made his rounds to all thirty of the computer stations ensuring they were all connected and ready for use.

During an observation, of the afterschool program, there were approximately 60-65 students present in the media center where the program was held. Half of the students were escorted to the second floor of the media center for reading and language arts, while the other half of the students remained on the ground entrance level to receive their extended learning opportunities in mathematics. The tutorial program runs for two and a half hours with a snack and a break with physical activities embedded into it. For most of the young men, that break is eagerly anticipated and can often serve as motivation for completing their assignments. It was evident that one African American male student who was eagerly waiting for the time in the schedule to participate in the basketball free throw, had forfeited his turn. Mr. Claude B’right had pointed out the student to me and in whispering voice explained, “He loves to go to the gym. He’s a very good basketball player,...he’s probably one of the better players.” However, with the announcement that those who have to complete assignments, don’t get to go to the gym today (Friday), the student was not privy to

free throw basketball. Even though, free throw is only for 15 minutes, Mr. B'right emphasized to the student:

This is what you're going to do. I'm going to have to separate you from your boys, your crowd, your crew, and you're going to sit down and get this work done and get it done now, because you can do the math, and they're only going to be in the gym fifteen, maybe twenty minutes. Guess what, you're going to have your assignment done by that time.

Even though the look of disappointment appeared to consume the young African American male student, he gathered his materials and commenced the work he was summoned to do.

When asked how he handles pushback from students if presented, Mr. B'right responded, "If there's an argument, I always go back to the default, these are the things I asked you to do."

For the purpose of further clarity I asked him to elaborate more what he meant by default and he explained, "Default is the easy stuff, the things you go over in class, that everybody can do like bringing a pencil to class, a notebook and having your materials. Even if the teacher goes three days without asking about those default items, the prepared student will have it."

According to Mr. B'right, he wants to assist his students in understanding how the small things within their grasp can make a difference that serves to propel them toward academic proficiency.

Saturday-Smart Math session. Another extended learning time sponsored by Mr. Claude B'right is the *Saturday-Smart Math Session* held on selected weekends for students and their parents to attend. Several weeks prior to the announced weekend session, students

received notices to take home and return signed indicating whether parents and students would be attending the session. Included on the notice were specific mathematic content areas that would be addressed during the session. As an incentive, bonus points were announced if students accompanied by their parents attended.

My observation of the *Saturday-Smart Session* which began at 9 AM and extended beyond the four hour time limit provided an opportunity to see parents and students working collectively together in a simulated classroom setting. As Mr. B'right greeted parents and students into the media center, he was joined by a building administrator, the assistant principal who also welcomed parents to the session, acknowledging the time they were giving up to be in attendance. There were approximately 38 parents and students seated as a team at the computers. As part of his introductory comments Mr. B'right, emphasized to parents the importance of students taking higher level mathematics in middle school and the value of mathematics at this junction in their child's academic career. "This should be the last class your child takes with the word 'math' on the spine of a book. Instead, in 6th grade, you should see Pre-Algebra, in 7th grade you should see Algebra; in 8th grade you should see Geometry and in 9th grade you should see Algebra II," expressed Mr. B'right. His remaining introductory remarks detailed for some first time parents, the protocol for the sessions and how credit would be earned.

An instructional overview was followed by guided practice, along with a short snack break before students began taking their quizzes. Mr. B'right explained, "You have the chance to earn 300 points today: 100 for showing up with your parents and 200 points from

the 2 quizzes in *Study Island*.” His smile and cheerful baritone voice resonated throughout the media center; he appeared pleased and happy to have parents and their students out for this second session of the semester. As he circulated the room to ensure all computers were functioning, and students were logged into the appropriate site, he also made a point to encourage parents to cheer for their students when they scored all 10 problems correctly on the guided practice activity.

The scene for this math session was very lively, engaging and diverse. There were Latino, African American and Caucasian parents with their students present. I observed four African American fathers with their sons and daughters and several African American mothers with their sons. After Mr. B’right reviewed linear equations and discussed the formulas used to solve these type problems, he moved from station to station offering assistance if needed. The hum of parents and students working together to solve practice problems filled the media center with what some educators refer to as ‘good noise.’ You could hear parents inquiring with their students how to solve the linear equation problems and some students offering their explanations.

Recognizing that several students were having difficulty understanding graphing linear equations, Mr. B’right moved to the portable white board angled in the front of the computer section where everyone was seated and iterated, “To solve this type of equation requires your knowledge of quadrants.” He illustrated on the white board the four quadrants and labeled each quadrant **I, II, III, IV** with the appropriate number line to identify where to locate ordered pairs on the coordinate plane and determine the slope of the line. He wrote the

equation $y = mx + b$ on the white board and added for further clarity $m = \text{slope}$ and $b = \text{the } y \text{ intercept}$. Mr. B'right interjected one of his antics to get his message across how important it is to remember the concept for slope of the line. He conjoled, "You must part, grease and massage down to the roots. For those who are unfamiliar, it's another way of saying commit to memory these rules." Some students and parents familiar with Mr. B'right's use of cultural references to emphasize a point, were seen laughing to themselves as they continued to work problems on the computer. Occasional applause came from parents cheering their students on when the computer program signaled all practice problems were correct. Students were encouraged to work through practice problems first before attempting the actual quiz problems. Only a perfect score of 100 was accepted to earn the credit from both quizzes.

As he continued to circulate around the room, he also used the time to discuss with parents recent quiz grades obtained from taking two quizzes per week. He provided work samples and suggestive ways parents could monitor their students' progress in his mathematics classes. I observed Mr. B'right informing one African American father, "What we're doing here on this site, I give regular opportunities for Cuz to practice. Check his planner out or ask him when he's home saying he's got nothing to do." The reference to sites offered in class for students to practice at home appeared to resonate with parents as some asked Mr. B'right to write the site addresses on the white board for them to have a copy for themselves.

After the brief snack intermission, Mr. B'right informed parents and students they could begin using their graphing calculators. Initially, he had prohibited the use of the graphing calculators; instead he wanted students to use their own knowledge and computation skills working the practice problems. Instructions were given for working in the quiz mode of *Study Island*. All 10 of the problems had to be answered correctly to receive a score of 100 percent. If a problem was missed the program would automatically start over again. Mr. B'right further explained the screen would indicate the score and he would record the scores from both quizzes.

A competitive spirit was felt as students and their parents began working to obtain the prize of 100 or 200 extra-credit quiz. Parents began cheering and raising their hands signaling for Mr. B'right to come to their station and record their perfect score. Mr. B'right announced after moving from station to station recording several scores,

“Do you see the work it takes to make one hundred? We're talking valedictorian stuff! The practice that we're doing here is the same amount of practice you have to put in at home to achieve these grades. The more focus we give these concepts, the better your son or daughter is going to do in math now and in the future.”

Time did not appear to be a factor. Although a few parents and students began leaving after 1 PM, many others remained until 3 PM in the afternoon. Parents thanked Mr. B'right with hugs and handshakes as they exited the media center. They expressed how much they had learned and the fun they had experienced working beside their child.

Reteaching

An instructional strategy used intuitively by Mr. Claude B'right to check for understanding was reteaching. He recognized the range of abilities of his students, particularly those who were considered non-traditional students taking higher level math for the first time. In an interview, Mr. B'right referenced a student he had been working with independently and offered this explanation, "Just in the class with everybody around and everything going on may not be enough. He picked up some of it. But he needs more attention given one-on-one to bridge some gaps." For many students these gaps include the fundamental mathematic concepts upon which to build a foundation for algebra.

Reviewing concepts not fully understood. Mr. B'right cited three major concepts he recognized as problem areas for underperforming students in mathematics. He iterated during an interview, "Their difficulty is not with the Algebra and putting together a chart or a table, or setting it up and knowing what to do. It is when a computation is required without a calculator that involves fractions, decimals and integers. If you make it rational and put in a negative fraction, you really, really throw some things off." A formative assessment offered during one of the class observations demonstrated the need for strengthening the conversions of fractions to percents. Illustrating on the Smart Board with a pie chart divided into fractions beginning with $1/8^{\text{th}}$ and ending with $1/16^{\text{th}}$, Mr. B'right announced to the class, "You have two minutes...do the ones you know first. You know $8/8$, $4/8$, $6/8$ and $2/8$. Now think about $1/8$." This quick review verified what he had initially stated during the interview

regarding students understanding of fractions. Most of the students were not able to convert the 16 divisions of the circle within the two minute time limit.

However, during the reteach discussion, students began to adopt the strategies offered by Mr. B'right in determining equivalents. When he stressed doing the ones you know first, he emphasized half ($1/2$), quarter ($1/4$) and three quarter ($3/4$) fractions and their equivalents—50% , 25%, 75% and further dividing the percents as needed to represent smaller fractions. He also emphasized the importance of learning the equivalents of smaller fractions such as $1/8^{\text{th}}$. He reported, “In elementary school you use more quarter fractions. It is imperative you learn the equivalents for $1/8^{\text{th}}$, $1/16^{\text{th}}$, $1/32^{\text{nd}}$, and $1/64^{\text{th}}$.” Thus, prompting Mr. B'right to express the need for his students to commit to memory the equivalents as a time saving strategy for test taking.

In another class observation, during instruction on linear equations, Mr. B'right posed the question, “What is the opposite of $3/4$? If you tell me $4/3$, is that the opposite?” Some students nodded their heads in agreement that $4/3$ is the opposite, while an African American male student bolted out, “It's the reciprocal.” In the midst of the lively discussion Mr. B'right created a t-chart on the white board and added numeral 4 along with several other number and fraction examples on the left side of the chart. To prompt the students, he asked for the opposite of numeral 4 and a student yelled, negative four. “If that's the case, summarized Mr. B'right, what about $3/4$?” Responding to the term reciprocal offered as the correct answer, he challenged his students to think deductively and consider the number line for more than whole numbers. Rather than illustrate a number line on the board, Mr. B'right

asked his students to imagine it in their minds and look to the left of zero to find what integers reside there. He further asked them to impose fractions to the left of the number line. The “aha moment” prompted students to eagerly complete the t-chart with the correct negative numbers and fractions. The re-teach activity also emphasized the use of appropriate mathematics vocabulary regularly emphasized during instruction.

Presenting various approaches to the concept. There are numerous strategies available for re-teaching to strengthen concept understanding. Small group instruction was one of several approaches Mr. B’right used in his arsenal of strategies for re-teaching. On several occasions, I observed a retired mathematics teacher, Mrs. Cannady available to work with individuals and small groups of students who were experiencing difficulty with some fundamental concepts such as ordering decimals or converting fractions to percents. During the 15 minute in-class session she worked with three African American males and one African American female student who had made errors in problem solving due to computation. She volunteered weekly, and was particularly utilized during post assessments in scaffolding skills not yet mastered by some students.

Having a strong command for his subject matter, Mr. B’right used various approaches to problem solving for his students to grasp. During a review for the concept finding the slope of a line, I observed Mr. B’right offering the ratio equation, $y_2 - y_1 / x_2 - x_1$ as another method for determining the steepness of the slope. He iterated to the class, “Any time you have a ratio, it represents change, in math change means subtraction.” He moved to his white board and added the Greek symbol for change, $\Delta(\text{delta})$, as a symbol for his students to

recognize for its meaning. Thus, he placed the equation $m = \Delta y / \Delta x$ on his white board, where students could see and reference most of the time except during quizzes or tests. Mr. B'right explained during an interview, he referred to the white board as his 'nomenclature board' because it was there he kept certain formulas, equations, symbols and other important mathematical phrasing to be in constant view for students to see and hopefully memorize.

The third strategy offered for finding the slope of a line was *rise/run*. He explained, "The coordinates on the line are determined and then counted as the vertical change (rise) over the horizontal change (run), this constitutes a ratio. It's a matter of plugging in the numbers from the equation to determine the slope of a line." As a final strategy, Mr. B'right explained to his class there are also visual ways to determine the slope. "Write this down: if the slope of a line points up to the right – it's positive; if it points up to the left -- it's negative," instructed Mr. B'right. Thus, he emphasized recognizing the position of the slope can be a time saver for multiple choice answers on tests and quizzes. The final reminder offered as an analogy during one of Mr. Bright's review caught both the attention of his students and me as an observer, when he offered this explanation: "Remember there are different ways to communicate stop: red traffic light, stop sign, policeman holding up his hand, red lights and sirens on an ambulance." By capturing something everyone can relate to as prior knowledge and linking it to the various strategies available for solving the slope of the line, Mr. B'right addressed reteaching methods to assist student concept building.

Frequent Assessments

Some form of assessment was regularly used by Mr. B'right and proved helpful in determining student mastery. Assessments can serve to reveal student errors, concept misunderstandings and guide the direction for additional instructional scaffolding needed by underperforming students. Mr. B'right used various approaches to assessment for his students. These included formative assessments, extra-credit quizzes and benchmark assessments. Initially, he provided some form of assessment weekly, however, as the semester progressed, he incorporated assessments twice a week offering the following explanation during an interview. "No one wants to be judged on a poor performance, so I break down the material into parts to be sure students understand the basic concepts emphasized," explained Mr. B'right. Thus, weekly class assessments guided the direction of instruction.

Formative assessments. To keep a pulse on the level of understanding his students were acquiring for mathematic concepts taught, Mr. B'right established regular and frequent assessments. Daily protocol for students entering his classes was to record in their student planners issued by the school, the quiz dates for the week and the concept for which they would be assessed. During an observation where Mr. B'right announced an added quiz day on Thursday as well as Tuesday, students protested: "Why we gotta take two quizzes in a week? This is too much Mr. B'right!" He had just collected a ten minute-timed quiz and offered that he was providing them more opportunities to make 100 on each quiz when he broke down the material into parts. "It's not the aptitude, it's the attitude," expressed Mr.

B’right. He further commented, “The goal is to make 100. Yes, some of you made 78, but that’s not what the contract was for...” He told a story to drive his point about attitude: “There was an old lady who tried 300 times before she passed the driver’s license test. You have to be persistent and never give up.” Students laughed, and one student chided, “They should not have given them to her after 10 tries.” The message Mr. B’right was trying to convey to his students was to remain consistent and never give up working to become proficient in mathematics.

The types of formative assessments varied and were often differentiated for the learners in his class. He frequently used quick checks at the beginning of class in the form of charts, tables and other graphic or visual representations to support learning and help foster self-regulation of the student. During instruction Mr. B’right regularly posed questions to determine if earlier mathematic concepts taught were mastered for students to be able to build on for newer learning. Close monitoring and movement throughout the class period also provided him with insights necessary to determine where gaps in student achievement were developing.

Extra-credit quizzes. Opportunities were presented for students to earn extra-credit when they demonstrated mastery of learned concepts and were willing to put forth extra effort and give of their time. These were usually specific times in a monitored environment in which the opportunity could be used. During *Smart Lunch* built into the school day or *Smart Saturday Session* in which parents and students were invited to attend, students could take extra-credit quizzes. For both sessions I observed, students utilizing on-line quizzes

from several sites including *Study Island* for which they had to get all of a set number of problems correct to earn the extra 100 or 200 points. During the time for the extra-credit quiz at *Smart Saturday Session*, Mr. B'right announced, "For those who are ready for the quiz type www.studyisland.com and enter the password. Once you have completed the full set of problems and you get 100, I'll be circulating around the room to record your score." The expectation from the teacher and understood by students was that you earned the full credit and not anything less than 100 for it to be accepted as an extra-credit quiz grade.

Classroom instruction with guided practice often included Mr. B'right referencing the sites in class therefore students were familiar with them. He informed them, "A lot of times I get quiz problems from these sites, because they correlate to your lesson. Here you will find printable worksheets for you to practice on your own." When asked to explain what he meant by contract he had previously alluded to in an interview, he explained, "I tell my students a quiz to me is a contract I enter with them, the same as pro stars enter in football and basketball... that is to give 100 percent of their effort. That's what I'm looking for, so they can feel a measure of success or reward for what they do."

Benchmark assessments. Scheduled quarterly during the school year and administered throughout the district, benchmark assessments were used to provide feedback regarding student achievement locally at the schools and in the district as a whole. Teachers are able to use the assessments to evaluate student mastery of content aligned to the state's standard course of study. Mr. B'right developed his own benchmark-like assessments at the end of units and administered them between the district's benchmarks. He explained the

need for his students to become more proficient as test takers and confident with representing/displaying the mathematic concepts learned. Therefore, embedded in his instruction were test-taking strategies to strengthen student ability as well as build foundational mathematic knowledge.

When quarterly benchmarks were administered in the district, Mr. B'right had some idea how his students would perform. During an interview, I asked him about the performance of his African American male students and he discussed their grades from various assessments. He responded, "They are maintaining and making small incremental gains. We are working to instill the basic foundational knowledge and once that's done, even more gains will be made." Sounding somewhat optimistic, he reminded me that his first year 'EVAAS students' who were selected based on data projections from district benchmarks and end-of-grade tests which had 70% proficiency as the baseline for consideration. He was aware that foundational knowledge was being built to support more complex mathematical thinking necessary for success in Pre-Algebra and Algebra.

Thus, the results he was seeing with his students was somewhat expected and in alignment with the quarterly benchmark data.

Use of Technology

Described as a goal for his professional development plan, Mr. B'right expressed his desire to utilize more technology as an instructional tool. Upon entering his classroom, directly centered in the front of the room was the prevailing Smart Board, considered as a teacher's best friend in delivering state-of-the-art resources for subject matter and student

engagement. The Smart Board is a large interactive white board that uses touch screen technology and can display selected videos from white board software. In the content area of mathematics, Mr. B'right regularly used his Smart Board to introduce a lesson or reinforce skills not fully mastered. For all except one classroom observation, the Smart Board was in use. The one occasion it was not in use was due to maintenance when all Smart Boards in the middle school were being re-imaged. Instead, the regular white board, referred to as his "nomenclature board" was used for illustrative purposes during instruction. This white board kept formulas, equations and symbols generally used and accepted in mathematics visible for students to reference.

During one of his classes, Mr. B'right utilized an on-line tutorial video reiterating what he had previously taught on graphing linear equations as an opportunity to scaffold or reinforce student learning. Students had their TI-83 graphing calculators in hand and were able to follow the seven- minute guided instructions offered by a young female instructor narrating the process.

Websites and teacher passwords were regularly given to students for them to access both at school and at home. He frequently used www.brightstorm.com as one of his resource sites because it covered materials from Algebra to Calculus and he also visited www.phschools.com to secure variety of quiz problems. Before the holiday break, Mr. B'right announced, "What if I email these sites to your parents for you to do more practice over the holidays. Would you like that? Then when your parents ask if you have something to do over the holidays, you will have a reason to get your younger brother off the

computer.” As a follow up to his suggestion, Mr. B’right provided each student with a take-home study packet for the semester break and forwarded the websites to parents for whom he had email addresses.

Stationed around the perimeter of the classroom, were several desktop and laptop computers readily accessible for student use. Software for guided practice and mathematic games at various skill levels were loaded on most of the computers and students were observed working at the stations during *Smart Lunch*. However, he described the use of one of his laptops as a ‘scrolling marquee’ where he had programmed three linear equation forms printed in large bold font, visible on the screen to continuously loop in sequential order mathematic concept entitled ***Linear Forms... $Ax + By = C$, $y = mx + b$, and $y - y_1 = m(x - x_1)$*** . One could also see the formula for the ***Pythagorean Theorem... $a^2 + b^2 = c^2$*** with an accompanying right triangle diagram. Students could focus their attention in the direction of the laptop computer regularly except during assessments. Mr. B’right explained he got the idea from observing how his younger third grade daughter had memorized words from cookbooks she frequently saw on visits to Grandma’s kitchen. He rationalized that, “If a child continuously sees shelves of cookbooks over and over again, they will memorize words based on repetition...and you wonder how some people have the appearance of being smart. It’s because they see or hear things repetitively.” Thus, his idea of a scrolling marquee was developed with hopes of having a large screen mechanism similar to multi-media boards used in advertisement expanded from the classroom into the cafeteria or other common areas of the school where students congregate or socialize and can frequently see mathematic

information at a glance. Mr. B'right offered that other curriculum areas such as Science or Language Arts could also utilize the idea of a 'scrolling marquee' to display concepts they wanted to emphasize.

Mr. B'right expressed that mathematics and technology were so intertwined together that most people were unaware of the connection. He explained to his students in one of his instructional monologues,

There are many things we benefit from because of somebody else's knowledge of mathematics. All you might be doing is pushing buttons and their ability to do mathematics makes life easier for you -- from a cell phone to a remote control, to a computer to digital music. Those devices (speaking of *iPods*) can store as many as 10,000 songs or more and you don't have to worry about keeping CDs anymore. In fact, transfer of information from here all across the world can happen in a matter of seconds because you are able to push a button.

His commentary to the students was intended to reinforce the value of mathematics and its relationship to the technology they have at their disposal. Mr. B'right frequently delivered what I referred to as his instructional monologues as a means of rendering relevance to his students, the value of mathematics. Whether the technology was instructional or used recreationally by his students, he wanted them to appreciate relevancy for what they were studying.

Real World Applications

In keeping with the teaching principle reflected in the guidance offered for continuous improvement in mathematics education by the National Council of Teachers of Mathematics (NCTM, 2000), Mr. B'right seeks to create relevance in his instructional practices. When questioned regarding his approach to fostering understanding of mathematical concepts to his underperforming students, he elaborated,

One of the things we try to do is – number one, come in and let the kids know that this is something that you can do. It's not an esoteric situation or something that's designed for just a few students or a segment to be able to do well. But, it is something that you can achieve and achieve at a high level. I try to explain to them how it is used throughout real world applications. Many times the kids that are most vulnerable with the material are those that the mathematics, for example, is not pointed out to them out in the real world.

Thus, a major instructional strategy observed to create relevance was Mr. B'right's use of props, his reference to student experiences and his familiarity with the world of pop culture through which most of his students experienced life. His use of humor and antics often served to keep students engaged and on occasion, caught off guard with the subtleties he would infuse for the purpose of invoking critical thinking skills.

Use of props and vivid imaginations. Other than the student desk he used in the seating arrangement with his students, Mr. B'right did not have a regular teacher's desk. Consequently, when he centered himself in the front of the room, it was as if Mr. B'right was

the performer soliciting the attention of his audience. There was no barrier between him and his students; rather, he was up close and personal with them in proximity. During a review on fractions and percents for an upcoming quiz, Mr. B'right brought to class a sleek, shiny red and black electric guitar. Positioned across his chest with a shoulder strap holding the guitar in place, he resembled a rock star ready to perform. The students were excited and several African American male students requested he play his 'box' for them. Instead, he held up two plugs in his hand, one red and one yellow, and posed the question, "Do you know what these are?" The immediate response from several African American male students was 'amplifier plugs'. "Correct, the red one is a quarter plug and the yellow one is an eighth plug, replied Mr. B'right. He further informed, "Fractions are everywhere and these plugs are handy to plug into your laptop, or into headphones for audio purposes." With the connection established, Mr. B'right proceeded to ask, "What do they equal in percents? Use your HOTS (higher order thinking skills)." A unanimous response from the class was 25 percent. However, when questioned what an eighth plug represented, there was an extended pause until he prompted the class with a clue, "Last period a young man offered that an eighth was half of a quarter- so what's that?" The response from some of the students was 12.5 percent. That same student concluded that every time you go up an eighth in fractions, you increase by 12.5 percent.

During another classroom observation, Mr. B'right used receipts from several stores of items he had purchased to explain how taxes (representing decimals) impact the overall price of a purchase. In North Carolina non-food items such as toothpaste or paper towels

have a sales tax rate of 6.75%. However, food items are taxed at a lower 2% sales tax rate. Students were grouped and instructed to create grocery lists and to determine the cost with both sales taxes. Cash back transactions were also added to determine the amount of change due a customer if requested. The activity was extended into a cooperative learning experience where groups of students had to determine prices of sale or discounted items from newspaper advertisements for promotional purposes. Sale items such as flat-screen televisions or *X-Boxes* represented those purchases more familiar to students.

After the winter holiday break, Mr. B'right brought to class his new digital camera to use as a prop to provide an example for understanding the range and domain of a function. He explained to students the difference in resolutions creates a sharper picture. By pointing to the markings around the lens of the camera, he described the power of zooming in or out on an object. Thus, creating relevance for mathematical applications associated with everyday experiences, he raised the level of student engagement during instruction.

Even though, window watching is usually not an activity promoted during instructional time, on one occasion Mr. B'right asked his students to focus their attention on the inclined walkway positioned outside the classroom as an example of steepness in determining the slope of a line. He further noted the importance of truck drivers needing the information of slope in mountainous areas where they may be traveling. He pointed out the use of deceleration ramps on some mountainous highways was designed to reduce the speed of trucks coming down an inclined road, especially during inclement weather or if brakes are faulty. Mr. B'right seemed to have a knack for creating such visual images

Valuing student experiences. Problem solving in mathematics is a way to extend learning. However, for struggling underachieving students, word problems specifically can add another dimension of difficulty if students are unfamiliar with some of the terminology or phrasing. Mr. B'right made a habit of building language skills and vocabulary development as part of his instructional strategies. He recalled a lesson on finding the area and the opportunity it provided to scaffold vocabulary development for some of his students:

Our problem yesterday was dealing with a grassy area and the word 'sod' was in the word problem. So you know you make it a teachable moment: "What is sod?" I didn't get any answers and people were calling out some things that were wrong,...and one young man in my class said, "It's grass." Some other students were laughing and I said 'sod' is grass. I asked, "How do you know?" He said his uncle had a landscaping business and he worked with him and he taught him about ...all the different types of grasses like Bermuda grass. When does Bermuda grass turn green? The young man replied, "Summer time." I asked, "What about rye grass?" He said, 'Yeah rye grass is that winter grass- it'll be green as long as it's cool outside, but as soon as it gets hot it dies.' So he (the African American male) student brought in an experience and with it some pride and knowledge-something he had been exposed to...within the context of what we work with in the classroom.

He made a point to advise the young man to learn as much as possible about landscaping because it could become a skill that could provide employment for him in the future.

Another experience related example Mr. B'right used to help his students understand finding the area, of a semi-circle and a rectangle was given as a visual that represented a basketball court. He asked, "Anybody ever play twenty-one?" He was referencing the free throw line where he iterated a lane violation can be given if the player steps into the area where the free-throw is thrown. "In that area, he explained, where the player is stationed to make a free-throw is a half circle." Speaking in the jargon of a coach, he further explained, "At the end of twenty-one, if you get twenty points, you don't shoot to win in the same area, you have to step through the outside area referred to as 'the top of the key'. Now you've brought in an experience that all the kids know, if they've played basketball." He indicated he has actually taken his students down to the gym to the basketball court and they can see and measure the 3-point arc, and where you can throw for the 2-point arc. "So now we're using our vocabulary, the word area, the word region...different forms of vocabulary the kids can relate to and it's a good thing," reflects Mr. B'right. Whether on the basketball court or out on the football field demonstrating area to enhance mathematical concepts, Mr. B'right incorporates relevancy for greater understanding.

He uses caution however, when selecting examples for instructional purposes. For some students, the experiences are negative and would constitute word problems that reflect real life situations that may be stereotypical. "I've heard students offering as a problem, there's an eviction notice on the door or what do you do, when you have \$5.00 on your card and you're trying to buy \$11.37 worth of food?", offers Mr. B'right. He prefers to make the examples positive for instructional purposes and to work to change the paradigm of thinking

for his students to one of always working toward their betterment with education as the leverage to do so.

Humor and other antics. Higher level mathematics has been perceived by some as a difficult subject matter to grasp and with that assumption some students have avoided enrolling in courses such as Algebra and Geometry. According to recommendations from the Final Report of the National Mathematics Advisory Panel (2008), mathematics performance and learning of groups that have traditionally been underrepresented in mathematics fields can be improved by interventions that address social, affective, and motivational factors (p.32). Thus, one of the emerging themes observed throughout this research study was the use of humor and other antics to engage and motivate student learning. Once during a classroom observation, in which he regularly interwove monologues into his direct instructional delivery, Mr. B'right remarked to the class, "If it takes you an hour and a half to watch *60 Minutes*, you may need to check on that." He was referring to those students who were not attentive during a re-teaching session. After a brief pause, the students burst into laughter as I did myself, signifying they understood his analogy.

To put even more emphasis on the value he has for his subject matter, Mr. B'right offered an explanation why he selected the instructional textbook he did for his non-traditional students taking higher level math for the first time. He began by addressing the perception that some people believe you are not capable of learning Algebra and would be better served in a regular mathematics class. He acknowledged, however, that his rationale was, "There are a lot of choices in books out there as resource material- *Algebra for*

Dummies is one.” Instead, he added, I refuse to get the *Algebra for Dummies* book because you are smart enough to know when folk are dumbing down something for you.” He frequently expressed high expectations for his students and would use humor as a non-threatening technique to motivate them.

There were several other instances observed in this research study when he used antics such as rhyme, creative jingles, or reference to pop culture to connect with his students. For example, after one of the quizzes administered to his students, Mr. B’right chided with an eighth grade African American male student while collecting his paper, “Young man, can I call your Dad and tell him your paper will be like *Alicia the Keys* with all the right answers?” On another occasion, he referenced a song by Beyonce with lyrics, “*To the left, to the left*”, to emphasize changing a percent to a decimal and moving two places. Even though a few of his jokes may have come across somewhat corny, the comic relief he offered was intended to reinforce a mathematic concept or to relieve test anxiety or tension. His use of jingles such as ‘learn to earn,’ or his reference to ‘algeropolis’ as the imaginary world of Algebra are his proclaimed ways to arouse the students to remember with rhyme. Converting the quadratic equation to the beat of the nursery rhyme *Itsy Bitsy Spider*, was yet another strategy for committing to memory important formulas and equations. He explained...”If you Google ways to remember the quadratic formula, people are actually singing those little songs as pneumatic devices.” He further added that depending on the maturity of the class, students will figure out- this is away for me to learn and keep in my

head (the quadratic formula). Mixing motivational messages into his antics, Mr. B'right advised his students to think about their future while in school and plan accordingly.

“When Dougy Fresh came out with his retro-mix ‘*Oh my God*’ from an earlier version he made 20-30 years ago, it was a hit. So you have to find your niche. What is it you can learn to do and do well? It begins here, while you’re in school.” Tapping into the world of his students through voiceovers and his familiarity with their music genre also provided the platform for thought-provoking discussions and reflection.

His explanation of the ‘Reds’ summed up his rationale for using humor and antics. “I have to come up with a way to make it interesting (mathematics instruction), so I say you can’t catch the ‘Reds’ in my class. You can’t be ‘bo-Red’, you can’t be ‘ti-Red’ or you’ll be ‘fi-Red’ because this is your job-to learn.” Mr. B'right further explained he holds himself to the task of making his mathematics classes interesting.

Parent Connectivity

Before observing or interviewing the research participant, his connectivity with parents was one of the outstanding traits the school principal elaborated on during the first of three interviews. She made a point to speak of frequent requests made by parents to have their children in Mr. B'right's mathematics classes either because a sibling had taken his class or because of his tenure teaching, the parent had been taught by him. In an effort to prepare me for what I would observe in Mr. B'right's class as it relates to parents, Mrs. Dunston, middle school principal, noted

He's committed to students and the parents, and as you are observing his class you're going to hear him refer to the kid's parents quite a bit. He a lot of times is funny and will make you laugh. He'll say, now don't make me have to call Mattie, or you know Bob will come up here in a minute if I need him...and they're not behavior problems. He's just trying to get them plugged in. He knows the parents and will contact them. I got a compliment on him in the beginning of the school year when parents were going crazy because they could not believe a middle school teacher would take out time to give them a call to say, 'Hi, I'm Mr. B'right and I'm gonna have your child. I want to make a connection with you any time you need me you can call me.' And he made that connection with parents from day one. They couldn't believe it. In middle school most teachers want to stay away from parents. He went directly to them. He can tell you where parents work. Do I need to go up there where Bobby's daddy works at the barbershop at so and so? Or you know so and so's dad works at Harris Teeter back there in the deli and I can find him."

She further commented on his availability to parents either in the early morning on bus or car pool duty or in the afternoon during afterschool pick up. Consequently, his reputation preceded him. However, one of the classroom observations yielded a deeper insight into the role parent involvement played as part of his instructional strategies.

Evoke the Parent. As the assistant basketball and football coach, he often interacted with his African American male students outside the classroom for extra-curricular activities such as practice for basketball or football. On one occasion, after having to speak

with this student several times for talking out of turn during class, he instructed a star basketball player, “Call your parents and tell them to pick you up after school, because you will **not** be at basketball practice this afternoon.” The athlete appeared stunned by Mr. B’right’s announcement. In his monologue delivery, he reminded the class, “Everyone is responsible for their actions and the consequences that go along with them.” At the end of class, the reprimanded student could be seen attempting to negotiate with Mr. B’right in an effort to be allowed to come to afterschool practice.

Later the next day, during an interview, Mr. B’right candidly addressed the incident with me regarding his star athlete as one he handled the way he did because he wanted it to be known that first, he did not have favorites and second, he uses a very effective strategy for handling potential discipline problems– ‘evoke the parents.’ For the purpose of clarity, I asked him to elaborate more on what he meant.

When I really, really need for students to remain focused and do what they are supposed to be doing- I’ll ‘evoke the parent.’ What would your parents say? Is this what they expect? If I were to call them up on their job right now and say, ‘What do you think your child is doing?’ They’d say he’s in math class. How many of them actually believe you’re sitting in school doing your work? You have your note book, you’re student planner and your workbook. You completed the assignments you were supposed to do and a project that is due Friday, you finished early. You’re not going to be up Thursday night trying to make it happen.

It was gleaned from his explanation that by ‘evoking the parents’, he used student’s perceived parent expectations as leverage to realign student conduct. In fact, Mr. B’right rephrased my interview question asking what he did to control classroom disruptions because he remarked bluntly, “I don’t like the word control...nor do I like manage; rather, I like for my students to make a conscious decision.” A decision that he iterated is based on parent-teacher-student relationships built over time. On occasion, in his monologue messages to students he referenced their parents by name and also informed them he had their parents’ work numbers on speed dial in his phone. The partnership he has created with parents is used to motivate student learning by projecting parents as an important component in the student’s academic life throughout his instruction.

When asked how parents can help their children at home, Mr. B’right referred to a study packet he sent home over the winter holiday break. It contained word problems regarding linear equations in test format with multiple choice answers along with an *Algebra Reference Sheet and Mathematics Chart* on the opposite side. Keeping in mind that eighth grade students taking Algebra have to be assessed on both eighth grade mathematics and Algebra, he often cross referenced both subject matter during his instruction to be sure content was covered and students were prepared for both End- of-Grade and End-of-Course summative assessments. His response to the question was...

I use the word Kia, name for a car to title those topics that students have to know.

Guys are into cars. I use that a lot to mean ‘know it all.’ The reference sheet is one that is a Kia. For a parent asking, what does my child need to do? Be sure they

know all of this. How can they do it? You can pull the sheet away from them. Area of a rectangle, give it to me in two ways. Area of a triangle, give it to me in two ways. If they can't give it, that tells you what your child needs to go back and study.

Whatever they have to do to have it "learned, retained and velcroed" to their brain.

His connectivity to parents and offering strategies to help their children are also demonstrated twice during the semester at a school wide "Strategies Night" offered for parents in the core content areas of Mathematics, Science, Language Arts and Social Studies. These are sessions parents can attend and gain better understanding of the curriculum while also developing skills and hands-on techniques for assisting their children at home.

As a veteran teacher for twenty years, Mr. B'right has connected with families and the community. He attests that he has been part of his students' families for several generations. Many of the parents, aunts, and uncles of his students he has taught or known them through social activities in the church or other community functions. Therefore, he proclaims, "How can a child misbehave when you have a strong relationship with their family and the community?" Although Mr. B'right's instructional practice to 'evoke the parents' has proven to be effective, he readily admits there is always more work to do in the area of parent involvement and concedes he keeps that as a goal in his professional plan of work .

Belief in Capabilities

The second research question focused on determining the belief the African American male teacher had of his capabilities to augment academic proficiency for his underachieving

African American male students. The intent of this research question was to investigate what the study participant perceived as his ability to perform his teaching responsibility, given his veteran status. In keeping with Bandura's (1997) construct of self efficacy, one of the sources of teacher efficacy beliefs is captured as mastery experience, where the individual interprets his purposive performance (p.4). The district initiative to enroll more non-traditional middle school students into higher level mathematics courses such as Pre-Algebra and Algebra had a direct impact on Mr. B'right's teaching assignment. Through in depth interviews and review of document data, emerging themes were identified in framing the findings for this section. Those themes identified through data analysis as beliefs held by the research participant were motivate students, promote self-regulation of behavior, elucidate math concepts and remove roadblocks to learning.

A trajectory path for success in Algebra was based on trend data for all students from mathematics End- of- Grade state and benchmark tests over a span of three years. However, for many of the non-traditional students placed in the higher level mathematics classes, there were affective factors that needed to be addressed as well in helping to bridge some of the gaps for these students. Placement in the classes brought to the surface some of the student fears and perceptions held regarding their ability or lack thereof due to prior experiences in lower level mathematic classes. Mr. B'right's reputation as an effective mathematics teacher was a major factor in his assignment with the 'EVAAS students', thus, he prepared himself for the challenge and opportunity that lay ahead working with these newly assigned students.

Motivate Students

Student motivation whether intrinsically or extrinsically influenced has been shown to be contingent on several factors within the school environment. Intrinsic motivation is internal and can be determined by the disposition of the student and what he or she perceives as their ability to learn. Extrinsic motivation is determined by those external factors prevalent in the school setting and the teacher can be a major factor in this regard. As it relates to African American males there is another dimension that is unique and specific to them at their pre-adolescent stage of development and that is identity formation. Davis (2006) offers in the review of literature, “The interaction of school context, masculine identities, and socialization are often minimized in research” (p.403). In conjunction with the engaging and relevant instructional practices that emerged as themes for the first research question, Mr. B’right believes his ability to motivate his African American male students is a major responsibility for him as an African American male mathematics teacher. He noted, “We have similarities as a group and I am sensitive to the fact that for some of my guys, the academics has not been successful...they can walk in as sixth grade students and you can already see that perhaps the academic environment hasn’t been the best for them.” Therefore, he contends that outside forces have begun to shape them and he has to work to shift the paradigm in thinking for some of his underachieving African American male students. That paradigm shift is from negative to positive thinking about themselves and their ability to perform in their academic setting. Mr. B’right believes having him as their

teacher and his professional belief that ‘all kids do learn’ is his motivation and determination to stay the course in working with his young men.

When referring to the fact that he is African American and understanding the role cultural relevant pedagogy plays in instructional practices, he extended the thought so that his students can identify with someone who mirrors their background with the hope realized they can aspire to more than their fears or circumstances. However, he is fully aware of the push back in some of their thinking when he raised the question, “What is it about being in the same skin I’m in that now you are adding this academic component? Great, you can play ball, you can rap or you can dance, but now you want me to do the academic stuff?” He reiterates the value he believes in establishing strong relationships with his students and their parents.

Onus on the student. Mr. B’right has a philosophical belief system that permeates through his demeanor in the class, his instructional practices and his outlook on achievement for his African American male students. He maintains that as the instructional facilitator in the classroom, he sets the tone for business and “you don’t shuck and jive” with the students. He readily contends that you put onus on students for the role they are required to play in the educative process. Even before class begins, during hall duty while students are changing classes I observed the interchange in conversation between him and students inquiring about their tools for learning. He would pose the question, “Young man, where are your books and how do you plan to come to work without your tools?” The onus on students also manifested itself as established classroom protocol with the first thing students are required to do when

seated is pull out their notebook, the student planner and workbook or textbook as signs of readiness for class to begin. If his scan of the class revealed that someone did not have those tools in place, Mr. B'right would remind the student of the expectation and require the student secure the tools needed for class. His persistence meant the student was not allowed to merely show up for class, but had to come prepared as an expectation.

He explained his thoughts regarding a student who made fifty percent on a quiz earlier in the semester and complained he could not do the work. Before reviewing the errors made on the quiz, he recanted his conversation with the student and expressed the following: "You made a fifty holding your head down on the desk and just using your ears. You've got some powerful ears. If you can do fifty percent without really trying, what if you were to apply yourself and study this stuff?" Thus, Mr. B'right emphasized that a major part of his task is to work on attitude:

Because, at the end of the day it can't be, 'well have a good life' attitude on the part of the teacher. As 11, 12, 13, 14 and 15 year olds, what are we preparing them to do? Keep in mind there's another group out there that will bring them into their family and have them doing all kinds of stupid stuff. Half of my job is to educate them and the other half is to help them see they have some choices in life. Granted I may be enticed to sell drugs, but guess what? I could be a doctor, I could be a lawyer, I could be a preacher, I could be a HVAC guy, or I could open my own business. I could do all this and the option is out there for those who want to do it fast. But guess what? I am smart enough to look at the consequences for fast gratification.

He believes that working to adjust attitudes can prevent his African American males from becoming 'gang bait' and help them with identifying the choices that are available to them. Whether he explicated his philosophical views in one of the regular monologues presented during mathematical instruction or he expressed it to an individual student, needing to be reaffirmed, the message was clear: **"never let them quit."**

Restore Point. The term was coined by Mr. B'right to refer to a motivation technique he uses with some of his African American males in an effort to shift their paradigm of thinking. He used the analogy of restoring a computer, "If you have a hard drive problem, you can go back to the last point when things were working." Such is the approach used in helping his students who have not had success academically, recall a point in time when everything was good...

I look at the young person now and they appear to be mad about something. The outward appearance or demeanor says...there's something bothering you. And I go back to the cumulative folder and look at the pictures. There's a progression, you know. There's this little guy right there with a big smile on his face in kindergarten, second and third grade. Then by sixth grade picture, it looks like a mug shot, you know. Why does it progress that way? What happened? Let's go back to the restore point, when Mrs. So-in-so would come in and she was positive and she was happy and you would do fun things. Whatever it is to re-live that restore point, let's go back to that. If I were to write a book about helping African American males that are having trouble, I would say find the restore point. We try to get to that point because

once you get them to that point; you can get them to do about whatever you want them to do academically.

Mr. B'right believes that the disengagement attitude he sees with some of his guys occurs too early. Over the course of five to six years of school and low academic performance on the part of some of these young men has fueled frustration. Thus the academic gap has widened and school is not fun anymore. Understanding external forces outside of school may have contributed to this gap, Mr. B'right believes, "We have to defrag the machine, and go back to the point when it was working and restore our young men." The time and effort Mr. B'right takes to make connections with his students, particularly the more challenging ones, he asserts is very reflective of those who took time and mentored him.

Raising the bar. Mr. B'right acknowledged gaps existed in the foundational knowledge needed for his higher level mathematics classes for some of his students. Given that these "EVAAS students" were selected based on the predictability of success, he recognized more of a variance in preparedness found in the eighth grade Pre-Algebra class than the eighth grade Algebra class. As a researcher, my observations in both classes provided some distinction between the two in the type of re-teaching that was done. Most consistently, those areas included fractions, decimals and integers as was iterated by Mr. B'right. However, he was adamant that the same quality of teaching was needed and given to his Pre-Algebra students to have the necessary footing to be able to enter into an Algebra class, the following year in high school as a ninth grade student and be successful. His

eighth grade Algebra students receive high school credits for successful completion in middle school and are ready for Geometry in ninth grade.

According to Mr. B'right, expectations need to remain high and rewarding minimal compliance is not acceptable. He explained, "I'll say good job on your work, but not because you came in and sat down today. Because you normally come in and through stuff and disturb or disrupt the class." The praise he explained is for that student extending himself and achieving the goal of mastery. He further offered that graduation should be a minimum goal for his African American male students and "then at that point there must be a post thing as part of the plan." The plan he is referring to could include four-year or two-year college, the military or workforce participation. However, his emphasis at the middle school level is to get his young men thinking beyond where they are so as to raise the bar by adjusting their attitude and vision.

Wilkerson and Lang (2007) posit that the disposition of teachers relates to attitudes, values and beliefs they perceive as necessary to be effective in their profession. Given the belief in his ability to motivate his students and scaffold them during the transition from regular mathematics to higher level mathematics, Mr. B'right refused to acquiesce to the notion that his African American male students could not gain the necessary skills to become proficient. Instead, he held high expectations for them. Despite the lack of preparation some of his African American male students faced, he maintained,

You don't water it down or truncate it because it's new or unfamiliar to them. They can do this work. If more time is needed or it needs to be broken down into parts,

then that is what we do.” We don’t want to close the door before we get everyone through. This subgroup that we’re working with, it seems the door closes too often for them before they get through it. I want to be sure the Martin Luther Kings get through, the McNairs get through, the gifted hands of the likes of Ben Carson get through, by showing them this is an opportunity they have.

Mr. B’right lamented that too much data on African American males is negative and is directed in such a way that perpetuates them feeding the pipeline for our penal system. He stated, “I’ve heard studies say they look at suspension rates for African American males as early as third grade as a predictor for how many prison beds will be needed.” Given such dismal predictors, Mr. B’right charges himself to do as much as he can because he doesn’t want to see his guys getting into trouble. “It hurts, he confesses, because you still have that pride.” Consequently, his instructional strategies are intended to motivate his students to another way of thinking about themselves and the value education can have on increasing their options. He admits that he ascribes to the sentiments expressed in a quote by President Bush that admonishes, “We cannot subscribe to the soft bigotry of low expectations,” as a statement that speaks to the essence of his philosophical view for educating all students who face challenges. Therefore, he contends the motivation is there for him to provide instruction that is informative and relevant so he can help with building capacity. Then his students can envision opportunities for themselves beyond their immediate circumstances.

Promote Self-Regulation of Behavior

The idea of self-regulation is the ability to monitor one's own behavior and is a goal Mr. B'right has set for his students. For those students and families he has a connectivity there is very little need for a punitive approach to be used. When questioned regarding his approach to discipline he rhetorically responded

How can you say anything but yes Mr. B'right, when you know their grandma, or taught their aunts and uncles. You can't be mad when I see your parents at the game and I'm talking to them. You can't be mad when your mom drives the school bus and when I walk by she blows the horn. You can't be mad that if I go to Food Lion right down here and your mom is working in the checkout counter, the first thing she asks is "How is my child doing over there at the school?"

His premise is, "You work to have a positive enough relationship that you can talk with a student when there is an issue, but you don't argue...I'm not going to argue with a child." Instead, he prefers to open up dialogue for discussion and not use his authority at will because he can. He concludes, "As an adult you don't have to have the last word on everything; I want to be an adult with a reasoned approach to things and always take it back to school." By using school as the default, he suggests the risk of escalation of a situation is minimized so it stays within the boundaries of the issue at hand. In the event there is an issue, he noted, "I will probably ask the student to stop what they're doing because there is a school rule about, let's say not chewing gum in class." He indicated the resolve to that incident would be to 'spit the gum out and come back to work.' However, depending on how

the teacher handles the situation, it can be de-escalated or escalated into something that hinges on an infraction that could lead to greater penalty such as suspension depending on previous incidences with the student or whether the district adheres to ‘No Tolerance’ discipline policy. Mr. B’right explains he is not in favor of ‘No Tolerance’ discipline policy because of how it impacts African American male students.

It affects African American students, but African American male students at a higher proportion with the things they can be suspended for. So I try to stop it before it gets to the suspension line...and as a teacher you know the suspension line. The suspension line comes probably right after the disrespect. When you allow it to go to the arguing part that’s when disrespect comes in, so I don’t argue because we don’t want it to go in that direction. Always take it back to the school—what I asked you to do was take out your paper and write this down or work on this problem. And if you can’t do the problem we’re going to help you with it. There’s no support in most cases from your parents for not doing it.

Mr. B’right cited in keeping with his ‘no arguing policy’ he has had to ask a few of his African American males to leave class to allow them time to collect themselves and be able to do what he was requiring. During one of my classroom observations, I witnessed him telling an African American male student to excuse himself from class until he can refrain himself from talking. The student was expected to stand near the doorway, where he could be seen and then allowed to re-enter class after several minutes. He attests that he has never had a student suspended for misbehavior or other infractions in his class; however some of

his students have been suspended in other classes. Although the ideal is self-regulation of behaviors, Mr. B'right admits for some of his students it is a work in progress.

Elucidate Math Concepts

Another recurring theme that emerged was the belief in ability to teach his subject matter well. Mr. B'right credited his mentors in college who advocated for a strong knowledge base of mathematics and accuracy in the explanation of problem solving. He frequently recanted stories of his professors drilling into him, "You don't get five or six steps into a problem and then erase." He expressed confidence in his ability to explain things and communicate in a manner that was clearly understood. In fact, the school administrator, Ms. Dunston indicated from teacher evaluations over the years, Mr. B'right's content knowledge and his ability to communicate effectively was one of his strengths.

When asked during an interview what he perceives as most effective as a teacher, he expressed a title shift from merely teacher to that of an 'elucidator.' Mr. B'right, the elucidator, he felt was more befitting of him and what he does. The reasoning behind the shift from teacher to elucidator was in the meaning of the term itself- to make clear. For him it is more about insuring concepts are understood than primarily teaching the content. Therefore, he admits he is always thinking of ways to teach mathematics in a way that connects to his students and is relevant for them. He elaborated,

You can sit there and teach all day long and the student might not learn the material. But if you make it clear to them, clear as the ear can hear and as the eye can see, oh you know, and it's easy." ...If I can take something that is unclear or nebulous to the

kids and go through and tie it to something they do know, then a connection is made. A lot of times we put math and science on certain groups of students. Let's say I tell you they're looking for people to join the math team. All of a sudden there's a concept that comes to mind that, Man that's for Asian and Indian students. They're the ones that gravitate toward that... I want it to be that this is for everybody. This is something we can all do, you know, and you can be proficient.

His logic is the reason why he constantly thinks of ways to engage his students using real world props or experiences from their lives. He explains the perspective of some of his African American male students, "After eight or nine years in school, they look at things as being just school oriented and what I want is for them to look at things and be able to point out –how this applies to the math we're doing in class." In addition, he also injected his charge to infuse critical thinking into his lesson as well. He reminded me of the class discussion on slopes that I observed prior to the interview. Beyond learning the formulas for determining slopes, he used examples to support the rationale for understanding the slope of a line. He raised several questions,

What would happen if they made one step lower than the other?" Then you're walking down the steps thinking the step is there at the same distance apart. What about the steepness of a mountain. Why are roads built to go around the mountain rather than go straight up the mountain? Why do we change the gears on a bicycle when it's time to go up a hill, up the slope? And why do you change to another gear when you're going down the hill?

Such examples and thought provoking discussions are frequently interspersed throughout Mr. B'right's classes to keep his students engaged and cognizant of the value and benefit of mathematics. He often discussed with his students how both science and math were interrelated. On one occasion I accompanied Mr. B'right and his students to an eighth grade science elective class where they joined Mr. Greenwood, the robotics teacher and his students to begin planning for the spring rocket launch. His mathematics students were paired with science students to begin discussion for the rocket design, how to measure air pressure and the distance the rocket would be propelled. Collaboration between the classes provided a prime example of the interconnectedness of mathematics with science while utilizing cooperative learning as an instructional strategy.

To be able to elucidate concepts in mathematics implies the teacher has a secure and grounded knowledge base. Regardless to the concept being taught, Mr. B'right usually provided several approaches to problem solving. A familiar approach to solving for area of a triangle is to use the formula $A = 1/2 bh$. However, in some instances the formula may or may not suffice based on the information provided for a given problem. Therefore, Mr. B'right always required his students to do an initial inspection first to determine what was being asked. In a discussion regarding isosceles triangles, he pointed out to his students that the example given was a SAT problem with the intent purpose of 'weeding out students.' He informed them through inspection of the diagram to use what they know about finding the area of a triangle and then he provided his students the rule for triangles: *the sum of any two sides of a triangle must be greater than the other side*. In the example of an isosceles

triangle, there are two congruent sides that are equal. From the answer choices provided, $AB = 2$ and $BC = 8$; he had his students apply the rule to see which choice best answered the problem. Through a process of elimination there were two possible answers: a.) 2, 2, and 8 or 8, 8, and 2, with the latter being the correct choice. With that initial information established, the formula for area of a triangle could be applied. To carry the example a step further, Mr. B'right reminded me of a class discussion in which he spoke of another way to find the area of a triangle and only one student had heard of this alternate method.

Do you remember when I asked if anyone had heard of Heron's Formula and there was a little guy in class who had heard of it? Heron's Formula is a formula that says if you have three sides to a triangle, you can find the area: $s = \frac{a+b+c}{2}$ (**half of the triangle perimeter**) and then calculate the area using

$$A = \sqrt{s(s-a)(s-b)(s-c)}.$$

Few teachers teach this strategy, he explained, because quite frankly, the less I know, the less I'm going to teach. And what do the SAT people say for that person who can find the area without the height? That one's a little bit better in the mathematics.

Mr. B'right adamantly stated how important it was for him to provide his students with quality instruction and not have them perceive they are being 'shortchanged' as a result of their assignment with him. His extensive knowledge of mathematics coupled with his belief in his ability to augment academic proficiency has provided him a high level of teacher efficacy. By providing a variety of solution strategies, he is working to extend the knowledge base of his students while increasing their capacity for learning. His approach to

teaching for understanding makes it applicable and relevant for many of his African American male students.

Remove Roadblocks to Learning

The final theme to emerge for the second research question determining the perception Mr. B'right held regarding his capabilities focused on his belief to remove some of the barriers to learning for his African American male students. He identified these roadblocks as conflicting attitudes regarding school, gaps in foundational mathematic concepts, and limited confidence in their ability. As an African American male, and father of two sons, he was keenly aware and sensitive to the issues faced by his African American male students on a daily basis. Whether it's the pervasive stereotypes they face or the impact pop culture may have in the development of their values, African American males vacillate between both negative and positive feelings regarding school and their place in it. For some contemporary youth, academic achievement is not viewed as a cultural value, and often associate negative connotations with black culture. Negotiating themselves and their identity can be challenging for middle school males.

Therefore, Mr. B'right contended that based on his positionality as the teacher in the class, he may also represent a father figure for some in the sense that he establishes a decorum and expectation for appropriate behavior. He explained,

...It has to be when they look at you and you tell them to do something that they understand and respect that you mean for them to do it because you care. I've never

had my guys to say he's 'acting white' because of the math stuff. Instead, I want them to say he's acting like a daddy that wants his kids to do their work.

Although, the image he portrays may be perceived as that of a father figure, he admits he is very careful not to undermine parent authority, even those who are absentee parents. Instead, he prefers to model behaviors that can be emulated during this pivotal time in identity formation for his African American male students. Referring to athletes and entertainers as images young people look to, Mr. B'right made a distinction between himself and celebrities affirming,

You take on responsibility... This is not the old Charles Barkley attitude, you know, I'm not this or I'm not that. I was told one time, they should just pay you to walk around here with a shirt and tie on, so that kids can see you because they don't get to see a lot of black males as professionals. I want them to see that someone from their background can achieve and be successful if they keep trying.

However, Mr. B'right's attire has shifted somewhat and if you were to observe him in the hallways or in his classroom, you would see a neatly dressed male teacher wearing a buttoned down flannel shirt, khaki pants and *Timberland* boots reflecting the contemporary footwear of his African American male students. He believes the relationships he has sought to build is key to shifting some of the wavering attitudes he sees in his African American male students. There have been instances however, when a few of his African American male students have exceeded the limits and been reprimanded. He explains usually these are students who have transferred from another school into his class and the relationship has not

firmly been established. Mr. B'right expressed grief during an interview where he lamented, "It hurt me to ask the young man to temporarily leave class because of his behavior." He explained, even though he has to consider other students in the class, he prefers students remain in class and receive instruction. He works to minimize recourses as the one I observed during the class period. By offering engaging activities to hook students into the lesson, Mr. B'right hopes to shift their attitude about school.

Some of the stereotypes placed on African American males can create subtle inferences regardless to whether you are young or middle age. Mr. B'right shared an experience early in his career that impacted him and the perception others had of him because of his gender and race. He recalled a comment made by a colleague when he first began teaching that was intended to be complimentary.

The lady said, "It would be easier for you to get a job here teaching math because you're black." I said, "I agree with you that it may have been a little easier with the pool of candidates for me to get the opportunity, being black. But I was able to keep this job because I was three times better at what I was doing than any of the other candidates. And we never discussed that again.

This response came as a result of an interview question I posed to Mr. B'right regarding whether or not he had a special yardstick to measure his underperforming students. He offered the story as a reminder to himself the stereotypes he and his students face and why he works to master his craft as an educator. He further added his philosophical belief that "**all kids do learn**" and in the case of African American students, they have to be prepared

regardless of the time and effort it takes to build their capacity so the misperceptions can be dispelled.

The second part to Mr. B'right's teaching philosophy is "**never let them quit.**" He believes some of the excuses his students give are a result of not wanting to put forth effort to go the full distance. Therefore, they will profess being bored or tired. Although, he affirms that many of his young male students have aspirations of doing things, they often lack the understanding of the role education plays in helping them achieve their dreams. He explains to them, "Somewhere in that process is going to be some learning and learning will lead to you being able to do whatever it is you want to do." Consequently, Mr. B'right believes providing instruction that piques students' interest is his way of engaging his students so they don't consider quitting as an option. If offering a rhyme or transposing the words to a rap song to accommodate a mathematic rule helps his students connect to the lesson, then he believes that is an effective strategy. Descriptors for the research participant are represented in the diagram in Figure 4.2. They are illustrated as attributes for high teacher efficacy and are intended to depict the interconnectedness of each attribute to the other. For example, emphasis on building positive teacher-student relationships can overlap with parent connectivity thus contributing to a heightened sense of teacher efficacy. Figure 4.1 also illustrates the overlapping nature of the attributes working in concert with the instructional practices exemplified by the study participant.

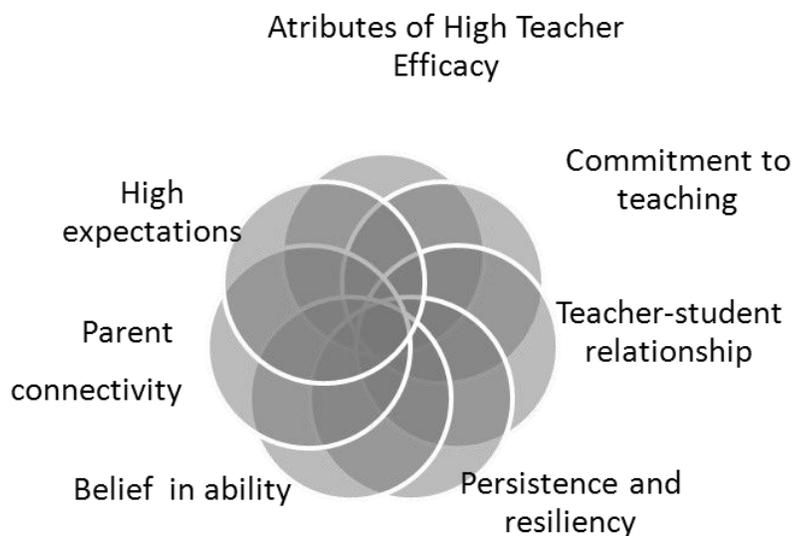


Figure 4.1
Attributes of High Teacher Efficacy

Chapter Summary

Chapter 4 presented the findings of the research study which included the participant profile and the final themes and subthemes emerging from each of the research questions. The themes for the research question investigating the instructional practices of the study participant were 1) extended learning time, 2) reteaching, 3) frequent assessments, 4) use of technology, 5) real world relevance to instruction, 6) humor and other antics and 7) parent connectivity. The recurring themes for the second research question determining the capabilities believed by the study participant in working to improve academic proficiency for his underperforming African American male students included 1) motivate students, 2) promote self-regulation of behaviors, 3) elucidate mathematic concepts and 4) remove

roadblocks to learning. With the findings presented in this chapter, the following chapter will provide further discussions, implications and recommendations for future research.

Chapter 5: Summary of Findings, Implications, and Recommendations

As a result of this study conducted to explore instructional strategies used by an experienced African American male mathematics teacher with his underachieving African American male students, various themes emerged to answer the research questions posed. The purpose of this descriptive case study was to examine perceptions held by the male teacher as it relates to moving his students along the continuum to proficiency. Chapter 5 will present a summary of the study discussions, implications and recommendation for ongoing research.

Summary

The focus for this qualitative study was on a single participant to determine his instructional strategies as an experienced twenty-year veteran African American male teacher working with low performing African American male students in middle school mathematics. The study participant was selected for his reputation as an effective teacher of diverse students and because of his experience working with underachieving students during his tenure in the profession. Given the prevailing achievement gap that exists for African American male students who are often not proficient in mathematics, and the very limited presence of African American men as teachers, two overarching research questions framed the study.

1. What are the instructional practices of an experienced African American male mathematics teacher?

2. What does he perceive as his capabilities in augmenting academic proficiency for his low performing African American male students?

A descriptive case study research design was utilized to capture this mathematics teacher's story and his unique instructional strategies. The study participant was selected for his reputation as an effective teacher in middle school mathematics, his years of experience, his race and his gender. The selection process for determining the participant was criterion-based in which purposeful sampling was done to attain rich description. Purposeful sampling served to provide in-depth and rich descriptions to better understand the study participant. There were a total of twenty-three classroom observations and fourteen interviews with the research participant, his school principal and a middle school colleague who had previously served the year prior as a student-teacher. In addition, observations, interviews, and data from documents were collected and reviewed as part of the data analysis process.

Each of the research questions yielded several themes and subthemes. The first research question provided seven themes and 13 subthemes, while the second research question yielded four themes and three subthemes. The overall data collected including the participant profile provided rich description and insights into the purpose of the study in determining instructional practices and beliefs held by an experience African American male mathematics teacher working to move his African American male students toward academic proficiency.

An investigation of the instructional practices used by the study participant revealed several themes from research question number one. Extended learning time emerged as a

primary theme used to provide students the needed support for grasping concepts not fully understood. The format structured as additional time comprised the subthemes a) *Smart lunch*, b) *Saturday Sessions* and c) *After school tutorial sessions*. The second theme reteaching was a strategy often used after assessments to reveal whether capacity building was still needed. Subthemes included were a) *reviewing concepts not fully understood* and b) *presenting various approaches to the concept*. The third theme was frequent assessments which served as the guidepost to determine whether more time on task was needed. Thus, the types of assessments that emerged as sub-themes were a) *teacher-made assessments*, b) *benchmark assessments* and c) *extra-credit quizzes*. The fourth theme, use of technology, emerged as an instructional tool instrumental in augmenting student engagement and extending instructional resources. Sub-themes in this category were a) *Smart Boards and other software resources* b) *scrolling marquees* and c) *desktop and laptop computers*. The fifth theme, real world relevance to instruction, was a fundamental strategy used to help students connect mathematic concepts with their everyday lives. The subthemes a) *use of props* and b) *valuing student experiences*, actually described the applications used to create relevancy. The sixth theme was humor and other antics used to motivate and engage student learning while having fun. The seventh and final theme was parent connectivity which was used to enhance parent involvement. The one sub-theme which emerged was *evoke the parent*.

The second research question yielded four themes with three subthemes emerging as perceptions the study participant held regarding his capabilities in working with his

underperforming African American male students. The first theme held as a belief in capability was the ability to motivate students. Several subthemes emerged to explicate this belief: a) *onus on students*, b) *restore point* and c) *raising the bar*. The second theme, promote self-regulation of behavior, explained his approach to classroom management. The third theme, elucidate mathematic concepts, explained his ability to teach and convey clarity of mathematic concepts. The fourth and final theme, remove roadblocks to learning, provided an explanation of the barriers the study participant believed he was able to help his African American males overcome in working toward proficiency.

Findings

Four main findings were drawn from the data obtained from this qualitative research study. First, upon investigating the instructional practices used, the influence of teacher-student relationships and its impact on attitude adjustment is prevalent. Second, is framing the instructional strategies to reflect the implementation of the equity and teaching principles. Third, is the understanding of the intersection of race and gender in the school setting. Fourth, is the identification of high level personal teacher efficacy.

Finding one: Influence of teacher-student relationships and its impact on attitude adjustment. The first finding from this descriptive case study is the influence of teacher-student relationships and its impact on attitude adjustment for students. As noted earlier in the findings and in the literature, some African American male students may have negative perceptions of school based on prior experiences.

Teaching and learning are not performed as separate entities of each other rather they co-exist within the social context of an environment. Within the school setting such interactions between teacher and student have the potential to develop into relationships once established, that can be meaningful and productive. Evidence of teacher-student relationship was manifested in the culture of the class and in the instructional format observed during the period. High expectations in a structured and supportive environment yielded student engagement. Where there is a positive climate of safety and emotional support generated by the teacher, students are more likely to transition from regular mathematics to higher level mathematics.

For most students and particularly African American male students, relationships are built and sustained through mutual respect and an understanding of the challenges they face. Most students were aware that their placement in the study participant's class was to help bridge the gaps they may have and to build a stronger foundation for higher level mathematics courses such as Algebra. Therefore, the sensitivities of the study participant to the students' needs are paramount to moving them toward proficiency in mathematics. As can be noted in the classroom seating of students and the close proximity of the teacher to students, the message conveyed is that 'we are all in this together'. Illustrated in the diagram of the classroom is deliberate intention to create collaborative and cooperative learning experiences between students and between students and teacher. In figure 5.1, students' desks are grouped together, with the teacher's desk in the midst of the groupings. Unlike the standard teacher-size desk found in most classrooms, the teacher's desk is actually a

student's desk positioned in front of students' desks, thus allowing up close and personal interactions between teacher and students.

Evidence of technology is also captured in the classroom sketch with touch-screen technology (Smart Board) and two work stations with 4 laptops for student use during regular class periods and at Smart Lunch. Several electronic kits (donated by Duke University) are also available for enrichment projects in the elective mathematics classes.

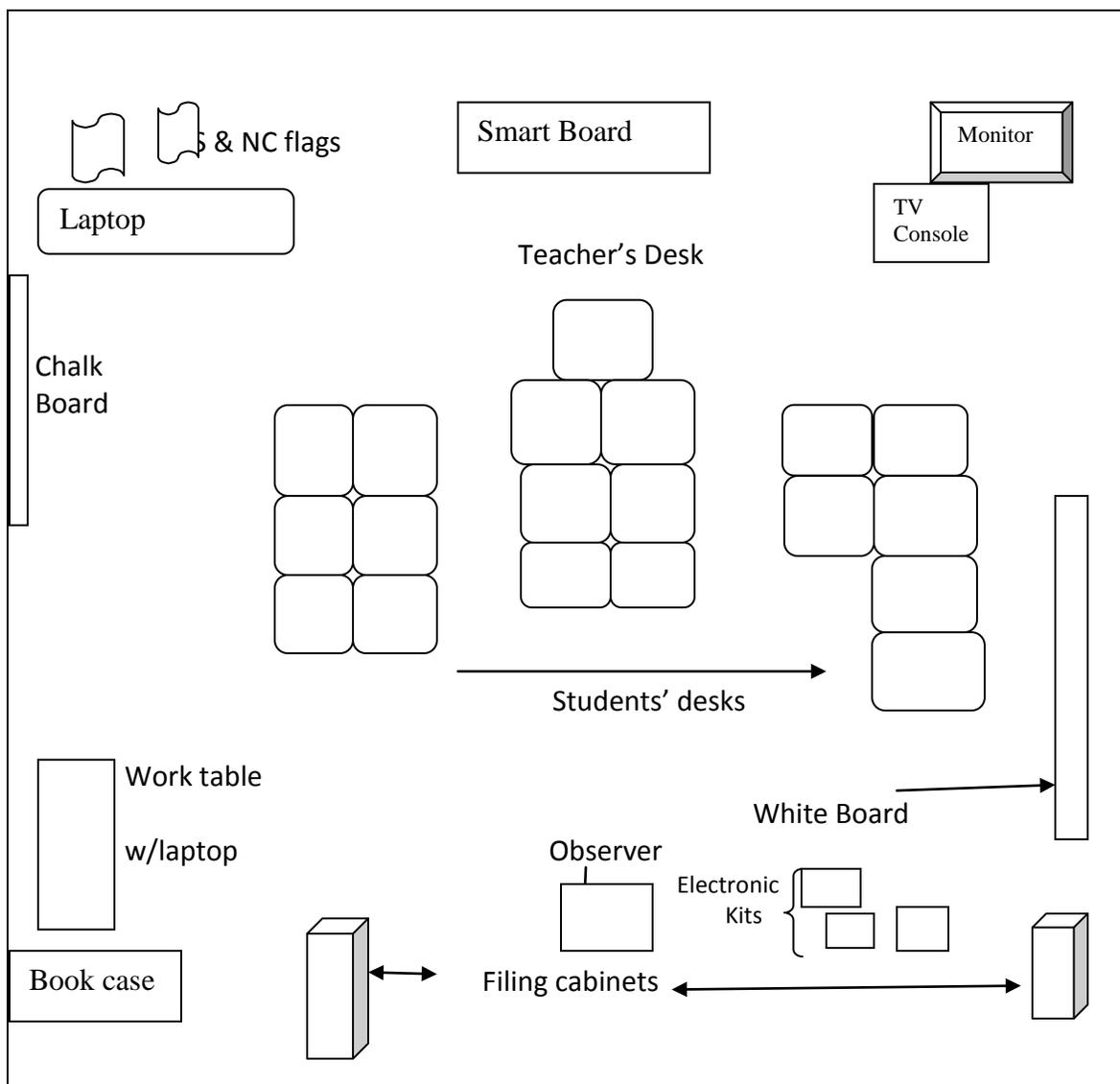


Figure 5.1 Sketch of study participant's mathematics classroom

Figure 5.1
Sketch of Classroom

classroom arrangement also provides ample use of technology for instruction and for student use. What is not captured in the diagram is the dynamics of the social environment when students and teacher are fully engaged in the instruction and learning process.

McKinley (2004) reports, “The social context for learning appears to be a key determinant of teacher’s success with students...and consistent with the research on contextual features and social interactions in learning environments, emphasizing fairness and respect, low favoritism, caring and low friction” (p. 3). It was evident in the study that attention is given to building cohesiveness through various points of connectivity: interest and participation in extra-curricular activity, parent and community involvement, classroom management and student willingness to persevere in the face of difficulty.

Students felt at ease and often eager to discuss their participation in extra-curricular activities such as musical performances, plays and sport events with the anticipation that their teacher was present and would share his comments with them. His humor antics along with familiarity with pop culture through music provided additional point of connectivity for his male students in class. Having this level of comfort, students were also willing in most instances to seek assistance when there were issues problematic in understanding mathematic concepts. The one-on-one engagement he provided also served those students who may have been a little hesitant to get help. His visibility and accessibility to his African American male students both in class and on the basketball court or football field are instrumental in strengthening the teacher-student bond.

Due to his tenure in the profession and the reputation he has established as an effective mathematics teacher, the study participant has a rapport with students, their parents and grandparents and jokingly considers himself as one of the family. Therefore, when he invites parents to attend quarterly weekend study sessions with their students they are eager to attend to glean some of his instructional practices and better understand the mathematics their children are learning. Given the length of time since many parents were in school and the newer approaches in mathematics education, parents feel comfortable in those sessions asking the study participant to help them understand so they can in turn help their children.

Instruction that is delivered in an engaging and differentiated manner to accommodate the varied ability students, serves to maximize learning opportunities. Realizing that one size does not fit all learners, multiple approaches are used to motivate students while keeping the pace of the class brisk. Mertens and Flowers (2005) offer that effective middle school classrooms are those that maintain academic rigor and the curriculum is taught in such a manner that makes it relevant and meaningful to the learner.

There was anticipation that for some students, gaps existed, limiting readiness skills for the higher level mathematics classes. Both promise and skepticism filled the air as to whether or not student gains would be significant enough to claim success for the initiative. Nonetheless, the progressive insight of the district and the participating schools move forward in creating more access and opportunity is indicative of its goal to better prepare all students for twenty-first century learning.

Finally, teacher-student relationships also impact classroom management strategies used with students. The approach used can be positive or negative depending on the established relationship. Usually when there is a well established teacher-student relationship, the approach is one that helps the student self-regulate his behavior. African American male students are very cognizant of the way they are perceived be it negatively or positively. Therefore, how they are disciplined, the tone of voice used or the lack of acknowledgement can trigger oppositional responses. Price (2006) contends that the social system operating in the classroom that serves to increase academic engagement for African American students is one that is interpersonal and utilizes academic- affirmative discipline.

Finding two: Implementation of equity and teaching principle. The notion of equity in mathematics is a construct that promotes access to higher level mathematic courses for all students. Regardless to where students are placed on the socioeconomic spectrum or their respective background the underlying principle is that students are given access and opportunity to gain quality mathematic education. In keeping with the National Council for Teachers of Mathematics (NCTM, 2000) principles, excellence in mathematics requires equity in expectation and support for all students. The research participant in this study was assigned non-traditional eighth grade students as part of the district initiative to provide more underrepresented students the opportunity to enroll in Pre-Algebra and Algebra courses before exiting middle school. Based primarily on predictability data obtained from summative and formative assessments and the willingness to challenge convention, local

leadership felt assured that it had the capacity to serve the newly enrolled students. That capacity was to be found in the study participant.

The research participant's experience working with diverse students from different ethnic backgrounds and abilities prepared him for the work in undergirding students with the foundational knowledge needed to become proficient in mathematics. His philosophical belief that **all kids do learn**, and **never let them quit**, coupled with his deep knowledge of content served as a mantra necessary for him to stay focused on the goal. I believe the equity principle frames in theory what the study participant put into practice working with his students. Extrapolated from the equity principle are examples of how high expectations and support manifest themselves: "Teachers communicate expectations in their interactions with students during classroom instruction, through their comments on students' papers, when assigning students to instructional groups, through the presence or absence of consistent support for students who are striving for high levels of attainment, and in their contacts with significant adults in a student's life" (NCTM, p.13).

If such actions can be viewed as determinants for promoting equity in education, then these actions are indicative of practices exemplified by the research participant through his connectivity to parents, the relationships he builds with his students, the time built in for extended learning and the motivation he gives his students to keep trying.

Parallel to the equity principle is the teaching principle, also cited as a vision for quality mathematics education. These two principles complement each other in that the ascribed actions for equity are found in quality teaching practices. For this research, the

study participant was selected in part for his reputation for effective teaching, strong content knowledge and the ability to build foundational knowledge in underachieving students.

According to NCTM (2000) the teaching principle recognizes that effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well (p. 17).

Although pedagogy can be explained as the art of teaching, it is more encompassing than having content knowledge. Included within the realm of pedagogy are the scope and sequence of the content taught, and the teacher's approach to teaching subject matter, classroom management, personal style of interacting with students and control over learning tasks. These aspects of pedagogy are enhanced with years of practice and experience with the desire to be committed to the profession. Hammond (2001) attests to the fact that experienced teachers are more sensitive to the needs of their students and their unique differences, more skilled at engaging and motivating students; and they can call upon a repertoire of instructional strategies for addressing student needs (p.471).

The increasing use of technology as a resource for teaching mathematics is an important enhancement to learning for students to feel competent of their knowledge base. Consequently, when students are able to use graphing calculators as tools for problem solving, they gain confidence in their ability. The use of computer software and touch screen Smart Boards prevalent in many classrooms provides hands-on approach to instruction with tutorial features available for remediation. It is evident the study participant places a high priority on the use of technology as an instructional tool to advance his students toward

proficiency. Having ample supplies of graphing calculators for every student, along with the presence and use of lap and desk top computers in the classroom, helps to enhance mathematics understanding in a visual and tactile manner. Regular use of computer software such as *Study Island* and other websites were accessible for student and teacher access.

There is an expectation tied to effective teaching and that is student progress. Effective teaching is also linked to academic gains as measured for accountability purposes. The intent of guiding principles and standards in mathematics education is to create a vision and road map that leads to excellence. As with most program initiatives, there is an evaluative component to determine measured teacher effectiveness. SAS EVAAS produces a value-added report to determine teacher effectiveness. Teachers in the district are evaluated to determine how well they facilitate student progress in mathematics, science and language arts/reading. The report compares each teacher to the average teacher in the state. There is also a diagnostic report which identifies patterns of progress at different achievement levels –lowest, middle, and highest for two years to establish a mean score. Student performance scores are used to determine teacher effectiveness. School principals are issued the report as an objective measure to determine the effectiveness of their teachers.

Contrary to the reputation held by the study participant as an effective teacher, his measured teacher effectiveness scores were in the lower percentiles. An examination of Mr. B’right’s mean scores and predicted scores for his students taking Algebra I, yielded an average mean score of 74 with standard error calculations, and was rated not detectably different from progress made by students taught by an average teacher in the state.

Compared to one of his colleagues who taught Algebra I, with average mean scores of 90, his student mean scores trailed approximately 15- 20 points. Table 4.3 illustrates the difference in value-added scores between the study participant who taught underrepresented students in Algebra and those of one of his colleagues who taught proficient and highly proficient students in Algebra.

Although some gains were made by the students taught by the study participant from one year to the next year, there were not significant gains to demonstrate teacher effectiveness in the teacher value-added report. It is the intention of value-added models to build in rigor that takes into account student background characteristics when comparing achievement across schools or teachers (National Academy of Sciences, 2010).

Table 4.3
Comparison of Value-Added Scores

Study Participant Scores for Algebra I				Colleague Scores for Algebra I		
Year	Mean Student Score	Mean Score %-ile	Mean Pred. Score %-ile	Mean Student Score	Mean Score %-ile	Mean Pred. Score %-ile
2009	157.4	69	73	167.0	92	90
2010	160.0	75	77	169.5	94	91
2-Yr Avg	158.2	71	74	168.4	93	90

However, caution is being advised in treating estimated ‘teacher effects’ as measures of “teacher effectiveness.” Braun (2005) refers to “inappropriate attribution” as problematic for most value-added models because “the way teachers and students are matched in real schools may be related to the students’ potential or rate of growth, teachers can be inappropriately credited or penalized for their students’ results” (p. 8). Braun offers the example of a teacher with seniority given the choice of classes he or she prefers to teach, to drive the point of possible “inflated teacher effect” given the students selected were better prepared. In the case of the study participant, he was selected by his school administrator to intentionally work with underachieving students with 70 percent predictability for success in higher level mathematics. Most value added models assure variables such as race and socioeconomics have been factored so they level the playing field for all students as if randomly sampled.

According to research scholars (Baker, Barton, Darling-Hammond et al, 2010), “even when methods are adjusted statistically for student demographic factors and school differences, teachers have been found to receive lower ‘effectiveness’ scores when they teach new English learners, special education students, and low-income students than when they teach more affluent and educationally advantaged students” (p. 3). Comparison of mean score percentiles for the study participant and his colleague reflect distinct differences in scores where students are not randomly selected. Thus, such findings illustrate the concern by some scholars with using value-added models to evaluate teachers.

Finding three: The intersection of race and gender. The education of African American

males has been viewed as problematic for various reasons. Too often negative connotations and stereotypes are imposed externally and in some instances accepted internally for this group. Cooper (2005) explains, results in fostering low expectations, feelings of inferiority and a sense of defeat in their academic pursuits. One explanation offered for underperformance of African American males explores the role gender and race play in identity formation for young African American males during their critical development as adolescents. How they see themselves and where they are positioned within the school setting attribute to identity formation. Murrell (2007) informs,

Concurrent with resolving conflicts with ego-identity implications are those conflicts of social identity—struggling with one’s sense of place in the immediate daily social settings of school. In other words, identity formation is a more complicated pattern for African American youth and is represented by the positionalities they take up to make sense of themselves in these complex intersections of race, gender, and privilege in a variety of contexts (p. 98)

Having the opportunity to investigate instructional practices of an African American male teacher interacting with other African American male students provides a window seldom opened due to the limited presence of African American men as educators in the profession. His understanding and appreciation for the complexities faced by being male and African American are shared because of similar background and experiences. The study participant can identify with the misperceptions held for African American males because his journey to manhood has possibly included some of them. Marginalized by racial identity and

stereotyped by gender creates a paradox that is worth further study. Discussions of race and gender are often polarized, however, there is growing evidence that minority students learn more from teachers of their own ethnicity than from other teachers (Peterson and Nadler, 2004). As it relates to African American male teachers and the influence they have on their African American male students, it is withstanding that committed professionals such as the study participant can serve as positive role models or father-like figures while simultaneously offer support during the development of identity formation in these young men.

Finding four: High level personal teacher efficacy. The study of teachers' belief in their ability to facilitate instruction that leads to achievement has gained interest as it relates to working with underachievers. Bandura (1997) explains teacher efficacy belief as a judgment of his or her capabilities to bring desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated.

From this research, the study participant demonstrated a high level of teacher efficacy working to augment academic proficiency for his students, particularly his African American male students. The following points link the findings of four to teacher efficacy literature: a.) teacher efficacy affects the effort they invest in teaching, the goals they set, and their level of aspirations, b.) greater efficacy enables teachers to work longer with students who are struggling, c.) efficacy beliefs influence teacher's persistence and their resilience in the face of setbacks, and d.) teachers with high sense of efficacy have greater commitment to teaching and are more likely to stay in the profession.

Hoy and Davis (2006) posit that teachers' behaviors in the classroom, such as their planning and curricular decisions; their attention, monitoring and verbalizations; and their interaction with students, are partly shaped by their sense of efficacy. Believing in themselves and their students, higher self-efficacy teachers look to controllable factors such as increased effort, improved teaching or learning strategies, better explanations or instructional activities, or improved help and support.

Investigative research for this study provided rich description of the study participants' instructional strategies to engage and motivate students. Fostering a climate of relationship building with his students provided a learning environment that was collaborative and safe. The goal of self-regulated behaviors was articulated as a means to shift classroom management strategies from that of being primarily teacher-directed to that of students having ownership for their actions. Thus, more time was devoted to instruction that promotes understanding and working to build foundational knowledge that may have been lacking in some underachieving students. Knowing that many of the assigned students were lagging behind with the readiness skills for higher level math, planned resources were secured even at the personal expense of the study participant. This investment of time and fiscal resources was evident.

Another link to high teacher efficacy is the will to work longer with students experiencing difficulty mastering certain mathematical concepts. Providing opportunities for more time on task, tutorials, guided practice and other such intervention strategies were regular approaches used by the study participant. The fact that built in times during the day,

and after school extended learning times were made accessible for students, speaks to the efficacious nature of the study participant. Also, the use of frequent assessments that allowed material to be chunked into smaller units permitted students more focused attention on certain concepts.

Labone's (2004) expanded definition of teacher efficacy to include those tasks that are within the framework of initiatives for school reform can be found in the district's push to enroll more underrepresented students into Algebra classes in middle school. Accepting the challenge to work with the lowest performing students came with personal rewards and stigmatizing.

Efficacy beliefs have been defined within the context of subject matter and to what extent a teacher believes they are competent in their area of study. Muijs and Reynolds (2002) concur, "That teachers' mathematical knowledge is linked to both teacher behavior in the classroom and to student outcomes." During the course of this research, the study participant made references to his teacher education program and the emphasis placed on deep content knowledge from professors and mentors. His variety of approaches to problem solving along with his real-world connectivity to mathematics equipped him with the personal teaching efficacy he perceived valuable in working with his underachieving African American male students.

Another attribute of high efficacy belief is teacher's persistence and resiliency. One of the prevailing values ascribed to the study participant was 'never let the student give up'. Regardless to the effort needed, Mr. B'right committed his time in and outside of the

classroom. His long work hours and continuous striving to increase the academic gains for his students were rewarding when students demonstrated their achievement on summative and formative assessments. He referred to end of year test results and reported 24 of his 26 students met proficiency requirements. However, when his student gains were compared with that of his other mathematic colleagues, the descriptor, value-added teacher, was not applied to the study participant. The gains made by his students were not strong enough to measure positive teacher effect compared to gains made by higher ability students taught by his mathematic colleagues as measured on the EVAAS instrument. Lower scores produced by low performing students and compared to higher performing students, decreases teacher effectiveness as measured by EVAAS. According to interpretive definitions provided by the EVAAS report, *Teacher Effect* is a conservative estimate of a teacher's influence on students' academic progress. It is my estimation, that once 'catch-up gains' have been met, teacher effect measure should increase.

Resiliency is an attribute given to high teacher efficacy. Grounded in self-agency, resiliency can serve as an anchor for surmounting challenges faced. Murrell (2009) posits

There are at least two critical factors left out of the complete accounting for academic success for African American learners- both of which involve the development of *agency* and a cultural and social intelligence on how to position oneself in settings complicated by racism and forms of ethnic and cultural stigmatizing in school practices, policy and pedagogy. One of these critical pieces of the picture is the

agency young people develop in asserting the integrity of their identity... The other is the identity work of the adults who work with African American learners (p. 97). Although for many adolescents the notion of agency is a process that develops over time, similar to maturation, having an adult who connects through racial background and cultural orientations can provide the guidance needed during the crucial time of social development. The research participant represents an adult in the school environment who can be regarded as having agency from a cultural perspective for the African American male students he interacts with and teaches.

There can be a stigma associated with working with underachieving students. The school administrator offered that given the majority students (60 %) in the middle school are high academic achievers and are taught by teachers whose valued-added scores reflect positive teacher effect as a result of them being taught by these teachers can negatively impact the perception held by a teacher who works with underperforming students. She admitted that seldom is the study participant recognized for his efforts because they are not yet significant enough to be measured as value added. Even though the principal is aware of the possible tension this may create for the study participant, her confidence in his ability is not diminished. The gap between reputation of the study participant and the measure of teacher effectiveness generated by a teacher diagnostic report raises issues for further discussion.

Nonetheless, teachers with a high sense of efficacy exhibit greater commitment to teach and are more likely to stay in the teaching profession. It is important to understand

how teacher efficacy is enhanced and promoted in the work place to retain effective teachers. Thus, teachers who are more efficacious tend to exhibit greater commitment and are more likely to stay in the teaching profession. It is important to understand how teacher efficacy is enhanced and supported in schools to retain effective teachers.

Implications for Research, Practice and Policy

Findings from this study offer implications for further research in teacher education, professional practice and policy making. These implications are aligned to the intent and purpose of the study which was to investigate instructional practices and perceptions held by an African American male teacher working with underachieving African American males in mathematics.

The research is grounded in the theoretical framework of self-efficacy by Bandura (1977, 1994) of which teacher efficacy is a construct. The scarcity of African American men teaching core academic subjects such as mathematics and the recurrence of low achievement among African American males has implications for further study.

A review of the literature indicates there is limited qualitative research available relating to teacher efficacy in the subject matter of mathematics. Attempts to quantify perceptions and beliefs of capabilities held by teachers, has led to instruments that attempt to measure teacher efficacy. However, discussions and further research narrative is needed to better inform the lived experiences of those in the field working to augment academic gains for underperforming students. Continued concern for raising achievement gains for African American students and particularly African American male students has grown over the past

few decades. More importantly, the addition of this study will add to the body of knowledge available from the context of mathematics education and teacher efficacy.

There is a need for further research to expand and fully engage this topic. Pajares (2006) posits that self-efficacy is a theory of personal and collective agency that operates in concert with other sociocognitive factors in regulating human well-being and attainment. Thus, the personal agency of teachers is situated within the context of the social environment of teaching and learning. The fact that self-efficacy judgments are related to task and are governed by the situation determines how individuals make use of these judgments in reference to some type of goal is worth investigation. Teachers who are stigmatized because they work with underachieving students can impact the pool of those who choose to stay in the profession. Therefore, an understanding of the sources of and support for teacher efficacy is vital in the retention and recruitment of highly qualified and effective teachers, particularly as it relates to underperforming students. There may also be an implied negative impact on veteran teachers who teach low performing students and are measured quantifiably to determine their effectiveness when compared to their colleagues who teach higher performing students. Although literature cites mastery experience as one of the sources self-efficacy beliefs are derived, what happens when outcomes do not measure up to proposed criteria. Is it reasonable to believe interpretive results of one's purposive performance can impact teacher efficacy beliefs over time?

According to Irvine (2009), African American students' ways of knowing and African American teachers' pedagogy is influenced by their culture and ethnicity. The

perceived positionality of a group of students or that of a teacher has implications that may be misinterpreted and thus require further study. The discussion of positionality is worth noting for African American students and African American teachers because it is situational in the context of schooling.

This research study is unique in that very few African American males are in the teaching profession. Reported in the literature, 90% of teachers in the profession are Caucasian American compared to 6% African American teachers (Center on Educational Policy, 2006). The statistics are even more telling when the miniscule presence of African American men represents approximately 1-2 % in the teaching profession. Therefore, the implications for practice are drawn from a perspective that reflects the current landscape, while also keeping in mind the pressing educational needs of African American male students. The Schott Foundation for Public Education (2004) placed African American males as a high priority on their agenda due to a failing report card published revealing the high incidence (59-70%) of those not graduating high school in some of our major cities.

Teacher education programs that prepare teachers to work in diverse classrooms must be inclusive of the needs of marginalized students such as the African American male student. At a time when school reform efforts seek to determine the root causes for persistent underachievement for groups of students found not to be proficient in reading or mathematics, including the lived experiences of effective and experienced African American teachers to teacher education curricular is worth consideration. Milner (2009) explains the importance of including the voice of African American teachers because “The texts of these

teachers are rich and empowering...Black teachers have had a meaningful impact on Black students' academic and social success because they often deeply understand Black students' situations and their needs both inside and outside the classroom." Thus, consistent with the literature, the social context in which teaching and learning happens is greatly determined by the pedagogical stance of the teacher and the sensitivities he or she brings to teaching their underserved students. Several implications for policy can be drawn as it relates to African American teachers and their role in the education of African American male students.

As teacher evaluation standards are attempting to measure teacher effectiveness, additional standards are being added for accountability purposes. Current education reform initiatives such as *Race to the Top* has many states considering the use of value added models as a way to tie academic gains to determine teacher effect on student performance. North Carolina is currently piloting the addition of two new standards to its Professional Teaching Standards. In addition to the five-standards in the new instrument, two additional standards have been added by North Carolina State Board of Education. **Standard Six:** Teachers contribute to the academic success of students, and **Standard Eight:** Academic Achievement Leadership (for principals and assistant principals). The value added model, EVAAS will provide data for grades 3 - 8 in English Language Arts and Mathematics. Teacher's rating on the sixth standard will be used in combination with other measures to determine teacher effectiveness.

There are considerable implications for practice as policies are being drafted and implemented in school districts. The question raised is will Standard Six have implications

for teachers who may possibly consider working in a high needs school with underperforming students? Also, how will the new standard impact teacher and student selection in an equitable way to assure students are assigned with varying abilities to all teachers? Proceeding with caution and a complete understanding of the components that support teacher s and school administrators is advised. In an effort to promote teacher effectiveness with the intent of achieving teacher quality of instruction, multiple measures are worth consideration.

Recommendations

This research study contributes to the body of literature available as it relates to teacher efficacy in mathematics instruction for underachieving African American male students. The instructional practices of the study participant included extended learning time, reteaching, frequent assessments, and use of technology. Each of the strategies has accompanying provisions worth consideration for use by teachers interested in improving the academic performance of underachieving students. In schools of education that prepare teachers for teaching, emphasis is needed on the four major strategies offered. Additionally, for teachers in the field, professional development on the use of technology as an instructional tool should be embedded throughout the year. While learning more about opportunities to extend learning time within the school day as well as beyond the school day holds promise for increasing student achievement.

The following recommendations are being provided:

- 1) Using qualitative research design, further study should be done to investigate effective instructional practices of teachers that move underachieving African American males to becoming proficient in higher level mathematics. A comparison of the findings from this study would provide deeper insights for in-service teachers and those who are novice teachers in mathematics education.
- 2) More research is needed investigating Algebra taught at the middle school level and the supports available for teachers working with underrepresented students.
- 3) A longitudinal study to determine student academic gains and the point when teacher value-added scores for those working with underachieving students moves from negative to positive teacher effect as measured quantitatively.
- 4) Self-reflection and discussion opportunities for teachers to gain an understanding of their perceptions and practices relating to teaching African American male students.
- 5) Adopting as best-practice for instruction, the use of relevant context in helping students make connections to mathematical problem-solving and their lived experiences.
- 6) Professional development which delves into social identity formation of African American males and the role it plays in their schooling during early adolescent development.
- 7) Increase teacher recruitment efforts in schools of education that lead to placement and retention of African American men as teachers in critical subject areas of mathematics and science, while providing incentives and rewards for experienced effective teachers in the profession.

- 8) Promote the “equity principle” in mathematics education so that the tradition of offering higher level courses such as Algebra to a select group is more inclusive of the underrepresented African American student as well.
- 9) Expand recruitment efforts by identifying promising students in Algebra and other higher level mathematics courses at the middle and high school level to include in the pipeline for teachers of color.
- 10) Include mentor programs that provide social opportunities for African American males to learn and interact with other men as models of success.

Lessons Learned

As a result of conducting this research study, I am reminded of the quote by Lerone Bennett, who contextualized what the struggle for education means to the African American. It has involved policies that support access to educational opportunities and in a stark reality, the lack of an education has led to limited progress: “Struggle is a form of education, perhaps the highest form.” Initially this study sought to determine the instructional strategies of an African American male mathematics teacher working to move his underperforming African American male students toward proficiency in mathematics. His tool kit of instructional strategies included many of the standard practices of good effective teaching with a focus on relationship building between teacher and student. His gender also revealed subtleties which may not have been recognized by women working with African American male students. Therefore, he was able to supplement the mathematics curriculum with additional strategies needed for identity formation in many of his young adolescents. An engaging male teacher

who was very knowledgeable of his subject matter and possessed other qualities provided an expanded lens of the possibilities for being an educated African American male.

His reputation for teacher effectiveness in working with low performing students sparked the interest to investigate his instructional practices. Moreover, the district initiative to include more underrepresented students into Algebra at the middle school created an added layer of focus. While creating more accessibility for nontraditional students to access higher level mathematics courses, embedded into the initiative was the notion of measuring “teacher effect” and tying teacher effectiveness to the academic gains of students.

Theoretically, the idea is a plausible one; however, the practice or implementation has reason for concern. Evaluation is a necessary component of teaching and learning especially during this era of reform in education. Thus, when funding is earmarked, the need for objective accountability measures is heightened. The use of value added models to determine teacher effectiveness can be a valuable asset if used in conjunction with other measures.

Closer analysis by data experts and researchers raise concerns worth consideration, such as random selection of students, which was not the case in this study. The research participant was assigned underachieving students to pilot the initiative. There was no random sampling of varied ability students. Consequently, when measured against his peers, the study participant’s scores did not reflect high enough student gains to be measured as an effective teacher. Even though research scholars contend that teachers exert influence on raising the achievement levels of students, a more comprehensive approach is needed when determining the measured effect. Given the research participant had a reputation for teacher

effectiveness in working with students who were underachievers and obtained measurable gains, it was not sufficient to rate value-added to the teacher. If students were able to continue another year with Mr. B'right, would greater gains be achieved over time?

Chapter Summary

This chapter began with the review of methodology used for this qualitative research study and the guiding research questions. There were four implications from the findings which included: 1) the influence of teacher-student relationship and its impact on attitude adjustment of students; 2) the implementation of the equity and teaching principles; 3) the intersection of race and gender and 4) high level of personal teacher efficacy. A discussion of these implications was provided along with implications for further study in research, practice and policy. Lessons learned by the researcher were also included. The chapter concludes with recommendations developed from the study to inform future research needed and best practices that augment academic proficiency for African American male students.

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APPENDICES

Appendix A: Consent Letters

Teacher Consent Form

Dear Teacher Participant,

Highly effective teaching is one of the cornerstones to student learning, especially for those students who are underachieving. Current reform efforts under the Elementary and Secondary Education Act (ESEA), mandates that all students reach proficiency by 2014. The urgency to reach these goals is the reason you are being invited to participate in a doctoral research study designed to investigate you as a mathematics teacher and to determine your instructional practices on African American males who have moved from under-achievement to proficiency. More specifically this research study will seek to determine teacher-efficacy in the content area of mathematics as it relates to working with one of the targeted groups—African American males.

The research study utilizes four data collection methods including: (1) observations, (2) interviews, (3) journaling by the teacher, (4) and reviewing existing documents from the teacher.

Observations

As the major research participant for this study, you will be observed in your mathematics classroom once a week for an academic semester. The observations will be used to assist the researcher in documenting your instructional strategies and to record through observations teacher interactions with your African American male students.

Interviews

As the primary research participant interviews will be conducted to gather information and to gain insights into your teaching practices as well as your philosophy of teaching, especially students who are underachieving. A series of seven, 90-minute interviews will be conducted during the academic semester.

Existing Documentation

Your lesson plans, parent letters, school administrative memos, student work and personal notes are the types of documentation that will be collected to assist the researcher with gathering documents relevant to the your instructional practices.

Additionally, your teacher evaluations and growth plans will provide the context for your professional development as a mathematics teacher.

Consent for participation in this study will also include the superintendent, your principal, and the IRB Board of Wake County Public Schools. Pseudonyms will be assigned to protect your identity as the research participant. Access to the data collected will rest solely with the researcher.

A summary of the research study will be made available to you, the research participant. However, both you and the school's identity will remain anonymous. Participation in the study will provide other educators in your district with useful and pertinent information regarding mathematics instruction for teachers and their work with African American males.

Your consent to participate will facilitate signing the consent letters attached and keeping one for your records and returning the other to the researcher.

Please forward questions or concerns regarding the study to me or Dr. Paul Bitting (Research Advisor). Thank you in advance for your support.

Respectfully,

Rhonda K. Muhammad

Dr. Paul Bitting, Associate Professor
and Research Advisor
North Carolina State University
Leadership, Policy and Adult and
Higher Education
Paul_Bitting@ncsu.edu
(919) 515-1768

This study has been reviewed and approved by the Behavioral Institutional Review Board of North Carolina State University. Contact the Behavioral IRB for any questions or concerns regarding your rights as a research participant in this study at 919-515-

Please indicate whether you wish or do not wish to participate in the research project. Upon signing your name, return one copy of this form to the researcher.

____ I DO grant permission for the mathematics teacher in his school to participate in this research study.

____ I DO NOT grant permission for the mathematics teacher in his school to participate in this research study.

Signature_____

Principal Consent Form

Dear Principal,

Highly effective teaching is one of the cornerstones to student learning, especially for those students who are underachieving. Current reform efforts under the Elementary and Secondary Education Act (ESEA), mandates that all students reach proficiency by 2014. The urgency to reach these goals is the reason your school is invited to participate in a doctoral research study designed to investigate a mathematics teacher and his instructional practices on African American males who have moved from under-achievement to proficiency. More specifically this research study will seek to determine teacher-efficacy in the content area of mathematics as it relates to working with one of the targeted groups—African American males.

The research study utilizes four data collection methods including: (1) observations, (2) interviews, (3) journaling by the teacher, and (4) existing documentation from the teacher.

Observations

The teacher as the major research participant will be observed in his mathematics classroom once a week for six weeks. The observations will be used to assist the researcher document the instructional strategies used and how the teacher interacts with his African American male students.

Interviews

Principal and teacher interviews will be conducted to gather information about the research participant (mathematics teacher) to gain insights into his teaching practices. Two principal interviews will be conducted at the beginning and at the conclusion of the research study for approximately an hour. Seven 90- minute interviews will be conducted during the academic semester with the research participant.

Existing Documentation

Teacher lesson plans, parent letters, school administrative memos, student work, teacher evaluations and personal notes are the types of documentation that will be gathered to assist the researcher with gathering documents relevant to the participant's instructional practices.

Consent for participation in this study will include the principal and the IRB Board of Wake County Public schools. Pseudonyms will be assigned to protect the identity of the participants. Access to the data collected will rest solely with the researcher.

A summary of the research study will be made available to the participant (teacher).

However, the school's identity and that of the participating teacher will not. Participation in the study will provide other educators in your district with useful and pertinent information regarding mathematics instruction for teachers and their work with African American males. Your consent to participate will facilitate signing the consent letters attached and keeping one for your records and returning the other to the researcher.

Please forward questions or concerns regarding the study to me or Dr. Paul Bitting (Research Advisor). Thank you in advance for your support.

Respectfully,

Rhonda K. Muhammad

Dr. Paul Bitting, Associate Professor
and Research Advisor
North Carolina State University
Leadership, Policy and Adult and
Higher Education
Paul_bitting@ncsu.edu
(919) 515-1768

This study has been reviewed and approved by the Behavioral Institutional Review Board of North Carolina State University. Contact the Behavioral IRB for any questions or concerns regarding your rights as a research participant in this study at
Please indicate whether you wish or do not wish to participate in the research project. Upon signing your name, return one copy of this form to the researcher.

_____ I DO grant permission for my mathematics teacher in his school to participate in this research study.

_____ I DO NOT grant permission for my mathematics teacher in his school to participate in this research study.

Signature _____

Appendix B: IRB Form

Revised February 3, 2009

North Carolina State University Institutional Review Board for the Use of Human Subjects in Research SUBMISSION FOR NEW STUDIES

GENERAL INFORMATION

1. Date Submitted: _____
1a. Revised Date: _____
2. Title of Project: Investigating the Instructional Practices of an African American Mathematics Teacher on Under-achieving African American Male Students _____
3. Principal Investigator: Rhonda K. Muhammad _____
4. Department: Educational Leadership and Research Policy _____
5. Campus Box Number: _____
6. Email: _____
7. Phone Number: _____
8. Fax Number: _____
9. Faculty Sponsor Name and Email Address if Student Submission: Dr. Paul Bitting _____
10. Source of Funding? (required information): Researcher funded only <u>yes</u>
11. Is this research receiving federal funding?: No _____
12. If Externally funded, include sponsor name and university account number: _____
13. RANK: <input type="checkbox"/> Faculty <input type="checkbox"/> Student: <input type="checkbox"/> Undergraduate; <input type="checkbox"/> Masters; or <input checked="" type="checkbox"/> PhD <input type="checkbox"/> Other (specify): _____

As the principal investigator, my signature testifies that I have read and understood the University Policy and Procedures for the Use of Human Subjects in Research. I assure the Committee that all procedures performed under this project will be conducted exactly as outlined in the Proposal Narrative and that any modification to this protocol will be submitted to the Committee in the form of an amendment for its approval prior to implementation.

Principal Investigator:

Rhonda K. Muhammad _____* _____
 (typed/printed name) (signature) (date)

*As the faculty sponsor, my signature testifies that I have reviewed this application thoroughly and will oversee the research in its entirety. I hereby acknowledge my role as the **principal investigator of record**.*

Faculty Sponsor:

Dr. Paul Bitting _____* _____

(typed/printed name) (signature) (date)

***Electronic submissions to the IRB are considered signed via an electronic signature. For student submissions this means that the faculty sponsor has reviewed the proposal prior to it being submitted and is copied on the submission.**

Please complete this application and email as an attachment to: joe_rabiega@ncsu.edu or send by mail to: Institutional Review Board, Box 7514, NCSU Campus (Administrative Services III). **Please include consent forms and other study documents with your application and submit as one document.**

For SPARCS office use only

Reviewer Decision (Expedited or Exempt Review)

Exempt Approved Approved pending modifications Table

Expedited Review Category: 1 2 3 4 5 6 7 8a 8b 8c 9

Reviewer Name	Signature	Date
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**North Carolina State University
Institutional Review Board for the Use of Human Subjects in Research
GUIDELINES FOR A PROPOSAL NARRATIVE**

In your narrative, address each of the topics outlined below. Every application for IRB review must contain a proposal narrative, and failure to follow these directions will result in delays in reviewing/processing the protocol.

A. INTRODUCTION

1. Briefly describe in lay language the purpose of the proposed research and why it is important.

The purpose of this study is to investigate the perceptions held by a veteran African American male mathematics teacher who works with a diverse student population and to determine his beliefs regarding his instructional practices working with African American male students moving them from underachieving to proficiency. Mathematics is the gateway to post secondary education. The crisis of limited education for African American males is worth study. Investigating instructional practices that augment proficiency for underachieving African American males can provide insights into acquiring a strong mathematics foundation that serves to assist these students in acquiring education beyond high school.

2. If student research, indicate whether for a course, thesis, dissertation, or independent research.

This student research is for dissertation requirements in the Department of Leadership, Policy and Adult and Higher Education.

B. SUBJECT POPULATION

1. How many subjects will be involved in the research?

The primary subject for this descriptive case study will be the mathematics teacher. Additionally, the administrator of the school will be interviewed for this study.

2. Describe how subjects will be recruited. Please provide the IRB with any recruitment materials that will be used.

I will seek permission from the principal and the teachers participant to conduct interviews to get an in depth description of the mathematics teacher. Attached are consent letters.

3. List specific eligibility requirements for subjects (or describe screening procedures), including those criteria that would exclude otherwise acceptable subjects.

This is a single descriptive case study focusing on a veteran African American male mathematics teacher who will be observed and interviewed to investigate his instructional practices as evidenced for his African American male students who are underachieving, and are moving to proficiency. Students who are not African American, or underachieving will not be considered for this study.

4. Explain any sampling procedure that might exclude specific populations.

N/A

5. Disclose any relationship between researcher and subjects - such as, teacher/student; employer/employee.

The participant was a workshop presenter on math games and careers that I attended several years ago.

6. Check any vulnerable populations included in study:

- minors (under age 18) - if so, have you included a line on the consent form for the parent/guardian signature
- fetuses
- pregnant women
- persons with mental, psychiatric or emotional disabilities
- persons with physical disabilities
- economically or educationally disadvantaged
- prisoners
- elderly
- students from a class taught by principal investigator
- other vulnerable population.

Not applicable

7. If any of the above are used, state the necessity for doing so. Please indicate the approximate age range of the minors to be involved.

N/A

C. PROCEDURES TO BE FOLLOWED

1. In lay language, describe completely all procedures to be followed during the course of the experimentation. Provide sufficient detail so that the Committee is able to assess potential risks to human subjects. In order for the IRB to completely understand the experience of the subjects in your project, please provide a detailed outline of everything subjects will experience as a result of participating in your project. Please be specific and include information on all aspects of the research, through subject recruitment and ending when the subject's role in the project is complete. All descriptions should include the informed consent process, interactions between the subjects and the researcher, and any tasks, tests, etc. that involve subjects. If the project involves more than one group of subjects (e.g. teachers and students, employees and supervisors), please make sure to provide descriptions for each subject group.

The research participant in this study will be asked to sign a consent form. He will be observed in his classroom setting weekly for a full academic semester beginning. His instructional practices will be the focus of the observations. In depth interviews will be conducted with him and his principal. Plans for data analysis will include analyzing document relating to his instructional practices for middle school mathematics (lesson plans, textbooks, student work, etc).

2. How much time will be required of each subject?

Twenty-three visits for classroom observations will be done over the semester. Thirteen-90 minute interviews will be held with the research participant and three principal interviews at the beginning, half way through and at the end of the data collection process.

D. POTENTIAL RISKS

1. State the potential risks (physical, psychological, financial, social, legal or other) connected with the proposed procedures and explain the steps taken to minimize these risks.

There is no potential risk anticipated for this study.

2. Will there be a request for information that subjects might consider to be personal or sensitive (e.g. private behavior, economic status, sexual issues, religious beliefs, or other matters that if made public might impair their self-esteem or reputation or could reasonably place the subjects at risk of criminal or civil liability)?

No

- a. If yes, please describe and explain the steps taken to minimize these risks.

N/A

- b. Could any of the study procedures produce stress or anxiety, or be considered offensive, threatening, or degrading? If yes, please describe why they are important and what arrangements have been made for handling an emotional reaction from the subject.

No

3. How will data be recorded and stored?

Data obtained from observations will be handwritten and word processed on computer. Notes will include the classroom setting, actions of the research participant (math teacher) and those of his students during the regular scheduled math class. The interviews will be recorded on a digital recorder and stored as an electronic audio file for transcribing into the computer. The files will be kept locked in filing cabinet and in computer file with a password for security protection.

- a. How will identifiers be used in study notes and other materials?
- b. How will reports will be written, in aggregate terms, or will individual responses be described?

Individual responses will be described throughout the research for the interviews, observations and data collection using pseudonyms to ensure confidentiality.

4. If audio or videotaping is done how will the tapes be stored and how/when will the tapes be destroyed at the conclusion of the study.

Interviews will be recorded on a digital recorder and transcribed into the computer as a secured document for storage.
The files will be kept for 24 months after the data collection and analysis. After that period of time files will be deleted from the computer.

5. Is there any deception of the human subjects involved in this study? If yes, please describe why it is necessary and describe the debriefing procedures that have been arranged.

No

E. POTENTIAL BENEFITS

This does not include any form of compensation for participation.

1. What, if any, direct benefit is to be gained by the subject? If no direct benefit is expected, but indirect benefit may be expected (knowledge may be gained that could help others), please explain.

As a result of having participated in this research study, the participant will have gained knowledge and insight into his instructional practices as a mathematics teacher. His own sense of personal teaching efficacy should be better understood in the face of many of the challenges facing teachers of underachieving students. Indirectly, students and school staff may benefit from this study as it relates to mentoring and supporting teachers who work with diverse and lower ability students.

F. COMPENSATION

Please keep in mind that the logistics of providing compensation to your subjects (e.g., if your business office requires names of subjects who received compensation) may compromise anonymity or complicate confidentiality protections. If, while arranging for subject compensation, you must make changes to the anonymity or confidentiality provisions for your research, you must contact the IRB office prior to implementing those changes.

1. Explain compensation provisions if the subject withdraws prior to completion of the study.

No compensation is offered the participant.

2. If class credit will be given, list the amount and alternative ways to earn the same amount of credit.

N/A

G. COLLABORATORS

1. If you anticipate that additional investigators (other than those named on **Cover Page**) may be involved in this research, list them here indicating their institution, department and phone number.

N/A

2. Will anyone besides the PI or the research team have access to the data (including completed surveys) from the moment they are collected until they are destroyed.

Along with myself as the primary investigator, my advisor and/or the dissertation committee may view the data obtained, if assistance is needed for data analysis. The research participant will be given the opportunity to review transcripts to assure accuracy from transcriptions. A transcriber will have access to the interview data being transcribed.

H. CONFLICT OF INTEREST

1. Do you have a significant financial interest or other conflict of interest in the sponsor of this project?

no

2. Does your current conflicts of interest management plan include this relationship and is it being properly followed? yes

I. ADDITIONAL INFORMATION

1. If a questionnaire, survey or interview instrument is to be used, attach a copy to this proposal. See appendices
2. Attach a copy of the informed consent form to this proposal. See attached appendices
3. Please provide any additional materials that may aid the IRB in making its decision.

J. HUMAN SUBJECT ETHICS TRAINING

*Please consider taking the [Collaborative Institutional Training Initiative](#) (CITI), a free, comprehensive ethics training program for researchers conducting research with human subjects. Just click on the underlined link.

Appendix C: Interview Protocol Form

Interview Protocol

Research Interviewer:

Interviewee:

Date: **Time/Class Period:** **Interview #**___

Place:

Objective:

Focus:

Guiding Questions:

- 1.
- 2.
- 3.
- 4.
- 5.

Appendix D: Interview Questions

Interview Questions for Principal

This research study is intended to investigate the instructional strategies of an experienced teacher who works to advance underachieving students to proficiency. The selection process is criterion-based in determining the study participant. The research study question is:

What are the instructional practices of an African American male mathematics teacher? What does he perceive as his capabilities in augmenting academic proficiency for his African American male students?

Your professional judgment as the academic leader of this middle school qualifies you to determine whether the proposed mathematics teacher best fits these attributes as a research study participant.

There are five (5) criteria to consider:

Profession – highly-qualified middle school mathematics teacher

Years of experience- minimum 10 years experience in the teaching profession to qualify

Gender – male

Race – African American

Reputation – highly effective teaching based on teacher appraisal, formative and summative student assessments (at least 80% proficient for African American students), and leadership in the profession.

Using the Selection Survey provided, information can be useful selecting study participants in the event this study is replicated.

Name	Years of Experience	Profession (Math Teacher)	Gender	Race/Ethnicity	Documented evidence of 80% proficiency on summative & formative assess.

Appendix E: Interview Questions for Teacher

Research Question and Sample Interview Questions for Teacher

What are the instructional practices of an African American male mathematics teacher and what does he perceive as his capabilities in augmenting academic proficiency for underachieving African American male students?

1. Explain your approach to teaching middle school mathematics?
2. Is it unique or would you say typical for most mathematics teachers?
3. Has your approach always been this way? Explain
4. How has your approach changed over the years? Explain
5. What do you consider contributed to the change in approach?
6. Has the shift in student demographics influenced your instructional practices? If so how?
7. How have you been able to determine effectiveness in your approach?
8. How flexible is this approach? Does it work for all students or a select group?
9. How do you see your instructional practices working with the African American male student?
10. What are some of the concerns for teaching middle school mathematics to all students?
11. Are there other concerns that are unique to African American male students?
12. When students are faced with difficult or complex concepts in math, what is your approach to instruction
13. In your estimation what is essential to good mathematics teaching?
14. Explain your personal measure of effectiveness to determine if you've gotten through to a student.

Appendix F: Document Summary and Contact Form

Document Summary and Contact Form

(Attach to the documents)

Date received _____ Site: _____
Type of Contact: _____ (with whom) Place: _____
Meeting: _____ Phone _____ Informal Inter _____
Coder: _____

Name/description of document:

Event or contact, if any with which document is associated:

Significance or importance of document:

Brief Summary of Contents:

If documents are central or crucial to a particular contact:

Appendix G: Observation Protocol Form

Observation Protocol Form

Research Observer:

Research Participant:

Date:

Time/Class Period:

Place:

Purpose:

<p><u>Physical setting:</u> description of the physical environment, the context, kinds of behaviors the setting is designed for, resources and technology available</p>
--

<p><u>Social setting:</u> description of the classroom scene, people in the classroom, what brings them together, who is allowed, what ways they are organized, patterns and frequency of</p>

<p><u>Activities and Interactions:</u> description of what's going on, is there sequence of activities, how do people interact w/activities, w/one another, how are people/activities connected, norms or rules structuring activity, beginning length of activity, typical or unusual.</p>

<p>Descriptive Notes: (verbal, non-verbal behaviors, context of conversations in setting, direct quotes)</p>	<p>Reflective Notes: (personal thoughts and ideas as a result of the observations)</p>