

**PERSONAL CHARACTERISTICS AND PROFESSIONAL ACTS OF TEACHING
OF SIX EFFECTIVE MATHEMATICS TEACHERS OF AFRICAN AMERICAN
STUDENTS IN URBAN MIDDLE SCHOOL CLASSROOMS**

A Dissertation

by

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ABSTRACT

This research study was conducted as a qualitative study of six effective middle school mathematics teachers who educate urban, African American students. The purpose of this study was to examine and interpret the life experiences and teaching practices of middle school mathematics teachers by hearing their voices. The intent of this study was to expand the finite qualitative research base on effective middle school mathematics teachers of African American students and inform superintendents, administrators, teachers, and researcher in urban school districts.

A purposeful sample of six middle school teachers provided a rich description of their characteristics through semi-structured interviews. Thematic analysis took place after each interview using axial coding and categorizing. The findings were categorized based on three major themes: Relevant Teacher Practices; Support³; and You Care, I Care. In total, ten sub-themes emerged from the voices of the participants. Sub-themes that emerged under Relevant Teacher Practices were: Keeping Students on Task, Hands-on Mathematics, and Relevant Mathematics. The sub-themes that emerged under Support³ were: Administrative Support, Collegial Support, and Parental Support. Finally, Relationships and Relevancy emerged as sub-themes under You Care, I Care. The participants' experiences affirm the literature of culturally responsive teaching and the ethic of care, while serving as a vehicle for mathematics teachers of African American students in urban middle schools.

DEDICATION

This dissertation is dedicated to God, who has given me the strength to endure; my grandparents, the late Charles and Ruby Lewis; and my family, who has supported me in this journey.

To my husband: Derrick. You are a wonderful husband and friend, who has always been by my side.

To my children: Anfernee Charles and Andrea Nicole. You are my inspiration. I am proud of both of you. Thank you for being wonderful children and knowing the value of education, which is the key to open endless possibilities.

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CHAPTER I

INTRODUCTION

Mathematics is one of the key elements to success in our nation today. It impacts the workforce and the economics of the United States of America. “The National Science Board indicates that the growth of jobs in the mathematics-intensive science and engineering workforce is outpacing overall job growth by a ratio of 3 to 1” (National Mathematics Advisory Panel, 2008, p. xii). Also, the acquisition of mathematics provides opportunities to for one to prosper and be productive in today’s modern and contemporary workforce. The report further contends that “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” (National Mathematics Advisory Panel, 2008, p. xii).

School reforms have been controlling aspects of education for decades. On October 1957, Sputnik was launched into space and national attention was given to mathematics. A 1983 report, *A Nation at Risk*, identified mathematics education as a concern, along with student assessment, quality of teachers, and mathematics resources, such as textbooks. Then, the *No Child Left Behind (NCLB) Act of 2001* emphasized teacher quality by requiring that all students are taught by highly qualified teachers. In addition to mandating teacher quality, the report also stipulated that all students will be on grade level by 2014. Since *NCLB*’s implementation, there have been great strides in education and a conscientious effort to educate “all” children. However, Thompson (2004) observed that “African American, Latino, and poor children usually bear the

brunt of the effects of failed reforms” (p. 63). It has been several years since *NCLB* legislation began impacting schools, but educating African American students in mathematics still remains a disorienting dilemma.

Presently, mathematics education has another legislative charge. In July 2009, President Barak Obama, introduced *Race to the Top (RTTT)*, a legislative program that allows states to compete for funding to improve education. Through *RTTT*, states are asked to advance reforms around four specific areas: The first area is adopting standards and assessments that prepare students to succeed in college and the workplace and to compete in the global economy. This allows for the United States to produce productive students in the wake of the federal accountability system. The next specific area is building data systems that measures student growth and success, and inform teachers and principals about how they can improve instruction. A monitoring system will allow teachers to make informed decisions based on the individual needs of students. Another specific area is recruiting, developing, rewarding, and retaining effective teachers and principals, especially where they are needed most. This is important because it allows students opportunities for ~~the~~ “highly qualified educators and access to a viable education. The final criterion is turning around our lowest-achieving schools. Students who attend schools that have a low mobility rate and low test scores are less likely to have the same educational opportunities for success as high achieving schools. This allows low achieving schools assistance with restructuring unsuccessful programs. *RTTT* is designed to provide access to quality instruction and highly qualified teachers for ~~all~~” students.

Teacher quality has been a legislative focus for nearly 30 years. Through *RTTT*, the most recent legislative reform, ineffective teachers will no longer be allowed to continue in the field of education. Schools would be required to follow a national standardized curriculum. In the wake of accountability, students who are from low socio-economics would have an equal opportunity to receive a highly-qualified teacher with access to a better education.

Background of the Problem

Importance of Mathematics

Mathematics can open doors to numerous opportunities in the workforce. In the ever changing times that we live in, a new way of mathematics has evolved in which doing mathematics and communications are critical for mathematics knowledge (National Council of Teachers of Mathematics, 2000). In the 20th century, the United States —possessed peerless mathematics-prowess” (National Mathematics Advisory Panel, 2008, p. xi). However, *The Foundations for Success: The Final Report of the National Mathematics Advisory Panel* (2008) further contends with the evolution of the internet, —attractive employment for technical workers is developing in countries that have been supplying invaluable talent for U. S. employers” (p. xi). Building mathematical capacity in the United States is imperative for its viability. As the nation continues to grow, the workforce will have to handle more rigorous quantitative concepts than today (National Mathematics Advisory Panel, 2008).

The National Council of Teachers of Mathematics (NCTM) developed the *Principles and Standards for School Mathematics*. According to Darling-Hammond

(1997), the council developed these standards as a compass of change, not a blueprint. The document gives guidance on developing a mathematics program and includes the following six principles: equity, curriculum, teaching, learning, assessment and technology. According to the *Principles and Standards for School Mathematics* from NCTM (2000), excellence in mathematics education requires equity – high expectations and strong support for all students. The *Principles* (2000) also contend that mathematics is important in the workplace, life, as a part of cultural heritage, and for the scientific and technical community.

The resource guide that NCTM has developed does not serve as policy. It contains research based recommendations and “the belief that all students should learn important mathematical concepts and processes with understanding” (National Council of Teachers of Mathematics, 2000, p. ix). In the wake of *NCLB* and *RTTT*, children have to obtain a proficiency level that allows them to meet a standard that has been set forth by the state. “A society in which only a few have the mathematical knowledge needed to fill crucial economic, political, and scientific roles is not consistent with the values of a just democratic system or its economic needs” (National Council of Teachers of Mathematics, 2000, p. 5).

Current State of Achievement of Students in Mathematics

The Nation’s Report Card communicates the results from the National Assessment of Education Progress (NAEP) assessment about academic achievement in mathematics. NAEP looks at the mathematical proficiency of students in the fourth and

eighth grades. Based on the results, African American students are improving, but the achievement gap is very large in comparison to European American learners.

According to the 2009 NAEP Report, there is a 32 point scale score gap between African American students and European Americans students in eighth grade mathematics. Gaps in mathematics achievement that are related to ethnicity and socio-economics have implications for individuals and the country (National Mathematics Advisory Panel, 2008). “In order for contemporary families and students of color to appreciate and have confidence in their cultural and intellectual competence, it is important for them to understand that the current ‘test score gap’ is neither the first nor last achievement gap standing between them and full equality” (Anderson, 2007, p. 2). This report further contends that many students begin to struggle with mathematics in middle school (National Mathematics Advisory Panel, 2008).

Teachers of Middle School Mathematics

Effective Classroom Teachers in Middle School

Based on research, African American students and their European American counterparts enter preschool and kindergarten with “the same basic intellectual competencies in mathematical thought and cognitive processes as their White counterparts” (Stiff & Harvey, 1988, p. 192). As African American students continue through their mathematical career, interest in the content can lessen. “Effective mathematics instruction depends upon the philosophy, policies and practices of a given school system” (Stiff & Harvey, 1988, p. 197). In order to meet the needs of African American students, they must be actively engaged in their learning. Mathematics

instruction for African American students should decrease the use of worksheets and drill and practice worksheets (Lattimore, 2005).

Many teachers must realize that the education of students can be affected by many factors. In order for teachers to be successful, they must have additional academic knowledge related to diversity and multicultural contexts (Garibaldi, 1992). “With that supplemental knowledge base, novice teachers will be better equipped to successfully teach children who come from culturally, racially, and socioeconomically diverse background” (Garibaldi, 1992, p. 24). This will allow teachers to have the knowledge base to be able to use flexibility and alternative instructional strategies when students are not successful.

Every child is unique in his or her own way and therefore has to be nurtured according to their needs. “Teachers of culturally different children, therefore, must recognize that learning distinctions are prevalent and that environmental influences can mediate academic success” (Garibaldi, 1992, p. 25). It is important to know that the classroom environment and expectations can be different from the home environment, which has more impact than the school environment due to the amount of time that a child spends at home.

Teachers play a vital role in the success of children and should use the innovative techniques and strategies as recommended by the National Council of Teachers of Mathematics, which include hands-on learning, communication through the use of language of mathematics and student-teacher interaction through instructional practices.

These strategies lend themselves to the African American learner, who is field-dependent (Stiff & Harvey, 1988).

Many teachers use the “traditional” approach to teaching. The students will sit in straight rows in the classroom and receive all of the instruction from the teacher with little or no interaction with the instructor or classmates. Teachers must know and use the learning modalities (kinesthetic, auditory, and visual) to accommodate the learning styles of students, furthermore, to accommodate the distinctive learning styles of students of color. Because African American students tend to learn in a relational style, concepts should be taught using a variety of strategies so that students, who are relational in their learning as well as those with an analytic learning style, may have equal opportunity to learn (Banks, 1988).

Teachers need to self reflect and be aware of how their actions in the classroom affect their students emotionally and academically (Cousins-Cooper, 2000). Some teacher preparation courses include a course in multicultural education and have had positive effects on teaching (Scott & Mumford, 2007; Burns, Grande, and Marable, 2008; Bodur, 2012). Teachers should do a self-evaluation of their beliefs and biases. The ideal teacher would be able to critically think about their biases and overcome them to be able to help all of their students learn (Gollnick, 1992). This process can be painful, but critical in meeting the needs of students (Strutchens, 2000). Effective teachers have high standards and expectations for their students (Jordan-Irvine, 1992).

There are numerous contributing factors to the struggles that the teachers face. African American students along with their teachers have struggled with the

mathematics curriculum. –African American students are less likely to have teachers who have strong mathematics content knowledge” (Strutchens, 2000, p. 7). Teachers need to be prepared to teach and realize that teaching is a profession in which they must be life-long learners.

Personal Story

I decided to become a teacher my junior year as an undergraduate student at Lamar University studying to be a mechanical engineer. It was at that time, I decided not to change my major and pursue my engineering degree. I wondered if I did not, how I would explain to my students not to quit. My love for mathematics is what drove my passion as an engineering student.

As a child in a small city, everyone had a tendency to know everyone. My case was no exception. My grandfather was the last principal of the segregated high school in Orange, Texas when it closed. I was well known and the plight to be successful was made for me. Because of his educational relationships, I had strong and caring elementary teachers. This gave me a great foundation, especially in mathematics.

In middle school, I was a year ahead in mathematics. This meant that I was in classes with older students. The teachers were less caring and I felt lost in the crowd. My success came from my support from home, which included my mother and my grandparents. I became disengaged until I began to participate in University Interscholastic League (U. I. L.) math contest. My passion for mathematics was once again ignited. Also, I began to attend a math and science program every Saturday that was supported by the Golden Triangle Texas Alliance for Minorities in Engineering

(GT-TAME). This organization gave me the same support that I received in elementary; it was like a refuge to me. When I was in 8th grade Algebra I, my teacher would call me “hon.” I despised going to class, because I did not want her to call on me. This was not because I was unable to answer the questions; it was because I thought she did not know my name and that really bothered me.

In high school, I moved through Algebra II and geometry, respectively. I vaguely remember those courses, but I made it through those courses being a stellar mathematics student, even though I felt like geometry would have no impact on my life. It was the most meaningless class in the world to me, at that time. My junior and senior years, I was blessed to have a caring mathematics teacher, Coach. He made Pre-Calculus and Calculus come to life. He always told me to look at the pictures. This was the first time anyone ever told me to look at the pictures. Coach gave me another way to see mathematics. He always found ways to make me understand the mathematics in addition to the procedures. Those two years, I was the only African American in my class. I was confident, but at times it was difficult for me to ask questions. It was because I thought it would make me inferior to the other students. Coach always reassured everyone that it was okay to have questions. I had a safe mathematics environment at school.

I took Calculus I, as a freshman, at Lamar University and Coach was there with me. He helped me when I needed it. Calculus I brought my first interaction with an African American professor, Doc. He recruited me to come to Lamar and was supportive until I graduated. I continued through my mathematics courses, which were very helpful in my science courses. The decision to continue as an engineering major was also fueled

by a professor, who told me to change my major, because I would not be able to graduate as a mechanical engineer. I found myself, alone once again. At this point, I was the only African American in my major courses and one of three females. I was determined to graduate with a mechanical engineering degree and I did. It was because of the support that I received from home, GT-TAME, Coach, and Doc. The care and support that I received was instrumental in my success as an African American, female, mathematics educator.

Theoretical Framework

Culturally Responsive Teaching

Culturally relevant pedagogy as described by Ladson-Billings (1995) allows students to have meaningful academic endeavors without losing self (“Toward a Theory of Culturally Relevant Pedagogy”). The teacher builds upon the culture of the students, which for African American students includes, building relationships, establishing a home-community within the classroom, and building on the prior knowledge of the student (Ladson-Billings, “Toward a Theory of Culturally Relevant Pedagogy”, 1995). This culture in the middle mathematics classroom would allow students to maximize their potential.

According to Gay (2010) culturally responsive teaching is defined as “using the cultural knowledge, prior experiences, frames of reference, and performance styles of ethnically diverse students to make learning encounters more relevant to and effective for them” (p. 31). The students’ cultures are acknowledged through educational experiences. Gay (2010) identifies the characteristics of culturally responsive teaching,

which includes several tenets. The first tenet is the acknowledgement of the cultural heritage of various ethnic groups. Teaching lessons using real-world experiences will help bridge the second tenet of culturally responsive pedagogy – building bridges between home and school experiences. Also, culturally responsive pedagogy addresses different learning styles by using different learning strategies. This would include the use hands-on activities to address tactile learners. A student’s culture would be celebrated and multicultural information would be incorporated into all subjects and skills.

Often times, African American students are expected to perform lower in mathematics by their teachers (Cousins-Cooper, 2000). Students who are in this type of classroom are rarely successful. “Specifically, culturally relevant teaching is a pedagogy that empowers students intellectually, socially, emotionally, and politically by using cultural referents to impart knowledge, skills and attitudes” (Ladson-Billings, 1992, p.19). The use of culturally responsive teaching provides opportunities for students to flourish in the mathematics classroom by building on their strengths, while providing access to effective teachers that meet the individual needs of their students.

Ethic of Care

In order to meet the needs of the African American students, mathematics teachers must be willing to “believe in their students’ ability to learn” (Jamar & Pitts, 2005, p. 130). “Teachers negative beliefs about African American students tend to perpetuate the disproportionate failure of African American students in school” (Strutchens, 2000, p. 8). This belief is teacher efficacy and is trait that has been associated with teachers that are successful with African American students (Bandura,

2001; Carter & Larke, 2003). “Teachers must care enough to provide effective, interesting, and well-developed learning experiences, and reciprocally students must study and work hard in order to become successful in learning” (Pang, 2001, p. 61). The Ethic of Caring has been defined by Noddings (1992), as teachers making a moral commitment to care and teach for each student and to develop a reciprocal relationship with them. According to Pang (2001), “caring teachers are willing to tackle painful inequities in schools and take hard looks at our own beliefs because we have made an ethical commitment to our children to make schools more relevant and effective for all kids (p. 64). According to Pang (2001) the fundamental beliefs about caring in education are: trusting relationships are reciprocated between the teacher and student; connections are evident between the students, teacher, and community; cultures are acknowledged; and views are valued and used for academic attainment.

According to Good (1981), characteristics of teachers who have low expectations can include providing students with less praise, demanding less from them, criticizing them often, interrupting them, calling on them less, waiting less time for them to respond. In the mathematics classroom, students need time to think and process and receive feedback from their teachers. In order for an African American learner to be successful, it imperative that the instruction they receive meet their needs, as well as the classroom environment that is conducive to learning. Modifying classroom practices could increase the academic achievement of the African American learner and foster a classroom in which the teacher cares for the learning outcomes in the classroom.

Statement of the Problem

A substantial amount of literature has been written on defining teaching and examining character traits and qualities associated with effective teaching. Research has also included an abundance of literature on characteristics of effective teaching with great emphasis on theoretical and practical approaches in reaching all students. However, there continues to be a void that fails to include the lived stories and experiences of effective middle school mathematics teachers that can inform others about the pertinent issues of teaching effective mathematics in urban education. These voices can provide an essential model and a better understanding of the construction of the middle school mathematics teacher persona and the way one effectively teaches urban, African American students mathematics. Therefore, additional studies are warranted.

Purpose of the Study

The purpose of this study is to examine and interpret the life experiences and teaching practices of six middle school mathematics teachers of African American students in urban settings. Discourse was used to construct meaning of their personal characteristics and professional acts of teaching as it relates to academic achievement for urban, African American, middle school students.

Significance of Study

Through a discourse on effective middle mathematics teaching, this research study can add relevant insights that have been traditionally excluded in the research of effective teaching of urban African American students. As a result, the impact of

effective middle school mathematics teaching on student academic achievement of African American students in a large, successful, urban school district can be acknowledge and appreciated. Also, it will provide educators with insights that will guide their professional development.

Research Questions

The purpose of this study is to examine the life experiences and teaching practices of six effective mathematics teachers in urban, middle schools. The following questions served as guides for the study:

1. How do effective mathematics teachers describe their personal characteristics attributed to success with African American students in urban, middle school mathematics classrooms?
2. How do effective mathematics teachers describe their professional acts of teaching as related to the student achievement of African Americans in the urban, middle school classroom?

Definitions of Terms

African American - United States citizens who are non-Hispanic and classified as "Black" by the Bureau of the Census. African Americans include individuals descending from any of the Black racial groups of Africa (Nettles & Perna, 1997).

Cultural Awareness - "Becoming functionally aware of the degree to which behavior is culturally informed and influenced" (Schram, 1994, p. 63).

Culturally Responsive Teaching - instruction that encompasses the culture and experiences of students in the classroom (Gay, 2010).

Cultural Sensitivity - attitudes, beliefs and behaviors towards students of other cultures” (Larke, 1990, p. 24).

European American - United States citizens who are of German, Irish, English, Italian, French, Polish, Dutch, Scotch-Irish, Scottish and Sweden descent (Banks, 2003).

Learning Styles - The cognitive, affective, and physiological characteristics that influence ways an individual learns.

Middle School - A public school that serves students in the 7th and 8th grade.

School Climate - the set of internal characteristics that distinguish one school from another and influence the behavior of each school’s members.” (Hoy & Miskel, 2005, p. 5).

Teacher Attitude/ Beliefs - An individual’s viewpoints or disposition toward a particular object. An attitude can have three components: affective (feelings toward the object), cognitive (beliefs or knowledge about the object), and behavioral (predisposition to act toward the attitude object) (Gall, Gall, & Borg, 2003).

Teacher Efficacy - Teacher beliefs about his or her personal ability to produce a positive effect on the educational achievement of students (Bandura, 1997).

Teacher Perceptions - the lens through which teachers view and evaluate the behaviors of others (Neal, McCray, Webb-Johnson & Bridgest, 2003).

Urban School District - A school district that has more than 50,000 students (Johnson, 1998).

Voices - Framework of detailed expressions of one’s way of knowing.

CHAPTER II

REVIEW OF LITERATURE

Introduction

This chapter provides a review of the literature that includes conceptual and empirical research that supports instructional strategies of effective teachers of African American middle school students in urban America. This literature begins with an overview of mathematics from the historical context. The next section discusses the current state of mathematics, which justifies the need for this study. This is followed by a depiction of urban education that includes the teacher preparation, teacher efficacy, and the deficit model. The review of literature concludes with a closer look at characteristics of African American mathematics students, ways to facilitate their learning in the mathematics classroom with an emphasis on their culture.

An achievement gap persists between African American students and European American students in mathematics. Secondary mathematics courses, in particular Algebra I and geometry, are considered a “gatekeepers” (Moses, 2001). Urban schools typically employ teachers who have low cultural understanding, efficacy, and math content knowledge. This literature review attempts to suggest direction for middle school mathematics teachers of urban, African American students.

The Importance of Mathematics: The Historical Context

Math has been a key factor in our world since the beginning of time. “The root of the term mathematics is in the Greek word *mathemata*, which was used quite generally in early writings to indicate any subject of instruction or study” (Burton, 2007, p.1).

Anthropologists have agreed that most all cultures, including the primitive civilizations over 20,000 years ago, have had some awareness of number (Burton, 2007). The early civilizations include the Egyptians, Greeks, and Babylonians. These civilizations had their own numeration and symbols, many of which were kinesthetic materials that included rocks and sticks; as well as, cutting notches in wood or bones, tying knots in string, or making scratches in the dirt that looked like tally marks (Eves, 1983). This numeration system was done in effort to keep track of animals and record the number of members in a tribe. As the needs changed, mathematics evolved into more than a system for counting.

As centuries passed, leading mathematicians emerged that included Aristotle, Pythagoras, Euclid, Fibonacci, Napier, Pascal, Euler and Gauss. Through these mathematicians, laws and sequences were developed that are still utilized today in the mathematics classroom and applied in many different fields. The use of logarithms invented by John Napier helps engineers perform calculations quickly and efficiently (Eves, 1983). Also, logarithms were the beginning of decimal numeration system. Pascal invented the first mechanical adding machine, which is the foundation for the graphing technology that is utilized today in the secondary mathematics classrooms. In addition to mathematician from other countries, there were notable African American mathematicians, Banneker, Fuller, and Carver, who played a crucial part in the development of the application of mathematics in a time when it was truly needed. Benjamin Banneker, who was an 18th century mathematician, was revered by Thomas Jefferson and President George Washington. Banneker's contributions include the using

of mathematics to predict a solar eclipse on April 14, 1789. The application of mathematics is important to the United States due to its influence on agriculture, commerce, manufacturing, warfare, and engineering (Strunk, 1967).

Many of the policies that govern education have not been developed by educators. In the landmark 1954 case, *Brown vs. Board of Education*, parents of twenty children filed a suit against the Board of Education in Topeka, Kansas, arguing that the segregated public school their children went to was not equal in quality to the school their White peers attended. The decision by the U.S. Supreme Court to rule that “separate but equal” was unconstitutional was considered an educational victory for people of color. “Separate but Equal”, which was the result of *Plessy vs. Ferguson* (1896), was no longer the mantra of public education. Separate schools for Whites and African Americans were no longer to exist; however, it was not until the late 1960’s that African Americans in the South began to see any changes in the educational system (Anderson, 2007).

Science and mathematics has been pivotal in shaping education in the United States. In 1957, Russia launched Sputnik, a satellite, into space. This was a huge defeat for the Americans in the field of science and mathematics. This sparked a focus on mathematics and science as a nation with another federal response by President Dwight D. Eisenhower to education, the National Defense Act in 1958 (Bybee, 1997). This was the beginning of federal funding based on low-socioeconomics and improving math and science instruction. In 1965, the Elementary and Secondary Education Act was signed by President Lyndon B. Johnson. This was his official “War on Poverty,” which led to

the largest federal funding effort in education. At this point, a national commitment was made to help all children to be successful. Because of the extensive federal funding and the professional development that was being offered, Kilpatrick, (1992) labeled the 1950s and 1960s the “golden age” in mathematics education. During this age, mathematics was taught abstractly with no support of manipulatives in the elementary grades, which focused on set theory, alternative algorithms for division, operations and place value through different base systems, and operations with fractions.

In the 1980s, the administration of President Ronald Regan initiated the *Back to Basics* movement. This reform was the result of declining standardized test scores and the increase of remedial mathematics courses in 4 year post secondary institutions as reported in *A Nation at Risk: The Imperative for Educational Reform*. Schools were focused on covering the basics-reading, math, and science (Jeynes, 2007). This reform began showing decreases in the achievement gap between white and African Americans students and between high and low socio-economics. (Conciatore, 1990; Haycock, 2001, Haycock & Jerald 2002). Teaching the basics in school to all of the children helps level the playing field (Jeynes, 2007).

In response to *Back to Basics*, in 1989 the National Council of Teachers of Mathematics, published curriculum standards for mathematics. This document included 13 mathematics curriculum standards by the following grade level bands: K – 4, 5 – 8, and 9-12. These standards for each grade level band include: (a) Mathematics as Problem Solving; (b) Mathematics as communication; (c) Mathematics as reasoning; (d) Mathematical Connections; (e) Number and Number Relationships; (f) Number and

number relationships; (g) Number systems and number theory; (h) Computation and estimation; (i) Patterns and Functions; (j) Algebra; (j) Statistics; (k) Probability; (l) Geometry; and (m) Measurement. The catalyst for the development of this document was the need to shift from a curriculum that focused primarily on computational skills (NCTM, 1989). With this new focus, decreased attention was proposed for the use of drill of algorithms and practice worksheets, teaching mathematics concepts in isolation and “being the dispenser of knowledge.” With this mathematics reform, the need for change in the mathematics classroom was detailed. The plan for the change in the classroom came from the thirteen standards (NCTM, 1989). Students needed to be engaged in authentic mathematics problems that included problem solving, which is the process in which students experience mathematics through real-world applications (NCTM, 1989). Communication is imperative in a mathematics classroom, the second standard focused on students articulating mathematical ideas verbally and written. As a student progresses through the grade level bands, in grades 5-8, a student who was a concrete thinker becomes more of an abstract thinker as a eighth grade student. The remaining standards can be explained as creating the “ideal” mathematics student who can make mathematical connections with numbers and variables within the mathematics strands of algebra, statistics, probability, geometry and measurement. These concepts are not mutually exclusive which supports problem solving as the vehicle for learning. This student grows as his intellect or mathematical reasoning grows. However, mathematics classrooms with students of color particularly African American students focus on rote

skills with few mathematical connections (Stiff & Harvey, 1988; Davis & Martin, 2008; Leonard, 2008).

As the National Council of Teachers of Mathematics continued to promote excellence in mathematics, in 1991 there was a focus on the professional standards for the mathematics teaching, *Professional Standards for Teaching Mathematics*. They rested on two assumptions: “teachers are key figures in changing the ways in which mathematics is taught and learned in schools and changes require that teachers have long-term support and adequate resources” (NCTM, 1991, p. 2). These standards included: (a) Standards for Teaching Mathematics; (b) Standards for the Evaluation of Teaching Mathematics; (c) Standards for the Professional Development of Teachers of Mathematics; (d) Standards for the Support and Development of Mathematics Teachers and Teaching. According to the professional standards, “effective teachers are those who can stimulate students to learn mathematics” (NCTM, 1991, p. 2). The success of mathematics education focused on teacher behaviors. The charge of mathematics educators became to produce problem solvers and critical thinkers in their classroom, along with becoming life-long learners in order to meet the needs of their students. (NCTM, 1991).

Current State of Mathematics in the United States

In 2000, NCTM created another document, *Principles and Standards for School Mathematics*, to serve as a guide for quality mathematics education for all students. It is revised standard based on the compilation of the previous publications based on the premise that there is a need to understand mathematics for use in everyday life and the

workplace (NCTM, 2000). There are literally two sections to this document-, the principles and the standards. The principles shown in Table 1, state the fundamentals that are needed for high-quality mathematics education. The use of the principles promotes a classroom that meets the needs of all students with emphasis on the whole child.

Table 1, Six Principles (NCTM (2000), p. 11)

The six principles for school mathematics address overarching themes (p. 11):

- **Equity.** Excellence in mathematics education requires equity-high expectations and strong support for all students.
- **Curriculum.** A curriculum is more than a collection of activities; it must be coherent, focused on important mathematics, and well articulated across the grades.
- **Teaching.** Effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well.
- **Learning.** Students must learn mathematics with understanding, actively building new knowledge from experience to prior knowledge.
- **Assessment.** Assessment should support the learning of important mathematics and furnish use information to both teachers and students.
- **Technology.** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

The 2010 *Condition of Education* report by the National Center for Educational Statistics (NCES), contained a section on high-poverty schools in the United States. The percentage of students that are identified by The National School Lunch Program's free or reduced-price lunch (FRPL) is used as the measure of school poverty. In 2007-2008,

17 percent of the 16,122 schools were identified as high-poverty schools. This means that at least 75 percent of the students enrolled in these campuses were eligible for free or reduced-price meals. A large number of the students that are eligible are students of color.

Additional report results show that high-poverty schools employ a large percentage of teachers of color (U.S. Department of Education, 2010). Many teachers in high-poverty schools have only a bachelor's degree, which meets the requirements for teaching; however, in low poverty schools more teachers hold a master's degree (Adamson & Darling-Hammond, 2012). In 2007-08, 45 percent of teachers worked in districts where a pay incentive was offered for recruiting or retaining teachers to teach in less desirable locations" (p. x). According to the National Assessment of Education Progress (NAEP) results in The *Condition of Education* 2010 report, between 2000 and 2009 the mathematics scores for 4th and 8th grade students in high-poverty school were lower than those of students in low-poverty schools. The White-Black achievement gap in grade 8 was report as 32 points. This gap has remained the same as in 2007 and 1990 (U.S. Department of Education, 2010).

The 2011 *Condition of Education* report by the National Center for Education Statistics (NCES), reported that from 1990 to 2009 the average grade 8 scores in mathematics increased by 20 points. There was no decline from 2007 to 2009 in the scores in the state of Texas. In those two years, there was no significance change in comparison to 2007 or 1990. However, the White students scored at least 26 points higher than Black students in mathematics.

Despite all of the educational efforts in mathematics, African American students are still being outperformed by their White counterparts. This gap in achievement has been noted to have lifetime effects on African Americans by limiting their opportunities for post-secondary education, employment and earning potential (Carnervale, 1999; Jencks, 1992; Ogbu, 1994). This can have an impact of the well-being of African Americans along with an adverse effect on the economy.

Urban Schools

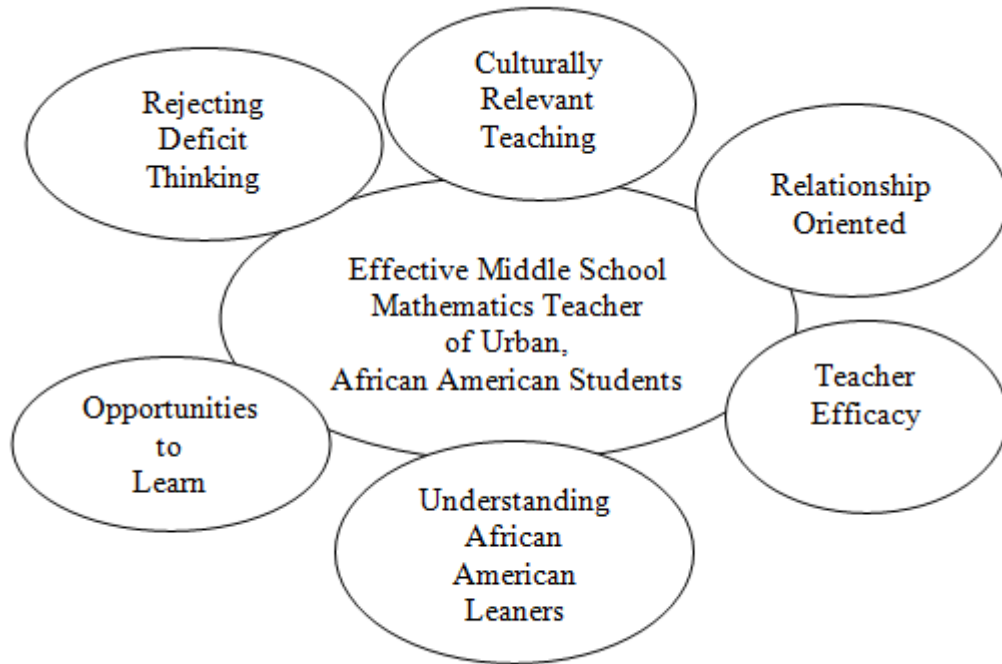
The urban school system has not always looked the way it does today. About 50 years ago urban schools were considered the pride of the educational system (Buckley, Schneider, & Shang, 2004). These schools offered a wide range of courses along with college preparatory and vocational programs. There were a few schools that were not as “good”, but the best schools were in the city (Angus, Mirel & Vinovskis, 1988; Mirel, 1993, and Rury & Cassell, 1993). Teachers that worked in the city were paid better; therefore, the urban schools had the most experienced teachers. Due to industrialization, cities grew rapidly, which caused the number of children to increase and a need for more public institutions. Post World War II, the inner cities started to take a different look; metropolitan development moved toward suburbanization. With this movement and an increase in home building in the 1960s, many European Americans moved from the city to the suburbs. At the same time, many African Americans moved to the city. This time of transition became known as, —White flight” (Bettis, 1996). Once the Whites began to move to the suburbs, the tax base started to decline. Because of the change in residential patterns caused the urban school system seemed segregated and began to suffer budget

shortfalls. Many of the recent arrivals to the city were poor and unable to support the costs of the schools. —White flight” led to two distinct problems: (a) segregation by location and (b) educating the large number of low socio-economic students with limited funding. Urban schools are still faced with those issues in 2012 (Rury & Mirel, 1997). Most students attend their neighborhood school, which means many students attend schools with children whose household incomes are comparable. Despite this, the school should provide access to high quality academics for the students that reside in the community.

Today, urban schools still remain under scrutiny in regard to how they prepare students of color. Many criticisms include that urban schools employ low-efficacious teachers, who do not know their content area and possess low expectations for the students. Many urban students matriculate through the education system with low-level reading and mathematics skills (Galloway & Lasley, 2010). The teachers, in urban settings, focus more on classroom management and less on content driven instruction. Working with student’s prior understanding can only take place if the teacher interacts with the students (Galloway & Lasley, 2010). This is a key component in the success in the mathematics classroom.

Based on foundation of mathematics until present, it has had implications for student success. However, African American students are not performing at the same level as their European counterparts in middle school mathematics. Figure 1 below represents a Conceptual Framework that depicts an effective middle school mathematics teacher of urban, African American students.

Figure 1: Conceptual Framework for Effective Middle School Mathematics Teachers of Urban, Middle School Students



Teachers and Teacher Preparation

In 1991, Haberman identified the following teacher practices as a basic urban style of teaching, a) giving information, b) asking questions, c) giving directions, d) making assignments, e) monitoring seatwork, f) reviewing assignments, g) giving tests, h) reviewing tests, i) assigning homework, j) settling disputes, k) punishing non-compliance, l) marking papers, and m) giving grades. These teaching practices do not lend themselves to high academic achievement and have been noted as the pedagogy of poverty, which is considered an ineffective mindset for teaching (Haberman, 1991). Many students in urban schools are exposed to this type of teaching and are the students

are compliant. Unfortunately, this does not empower students or provide them with the mathematics skills to be successful in their present grade level. It places a glass ceiling on the mathematics courses that students will be able to take in high school (Schiller, Schindt, Muller, & Houang, 2010). This lack of preparation can limit the economic potential of African American students.

Ladson-Billings (2000) discusses the preparation of teachers who will teach African American students. Teacher preparation programs focus on educating children as a whole. Programs do not specify ethnicity when it comes to educating students. —Schools and teachers treat the language, prior knowledge, and values of African Americans as aberrant and often presume that the teacher’s job is to rid African American students of any vestiges of their own culture” (Ladson-Billings, 2000, p. 206). The classrooms of today are more diverse and many teachers have had little preparation to prepare them to teach in today’s classrooms (Ladson-Billings, 2000). One or two courses in multicultural education will not adequately prepare teachers for the diversity that exists in education. —Work that uses autobiography, restructured field experiences, situated pedagogies, and returning to the classrooms of experts can each provide new opportunities for improving teaching” (Ladson-Billings, 2000, p. 209). During the autobiography, a pre-service teacher records their experiences in an effort to do reflective practice on their subjectivity in their course and in the field. Despite the fact that some pre-service programs require their students to complete their field experience in a diverse school, most field experiences of pre-service teachers take place in middle-class, predominately European American schools. If the field experience was

restructured, the teachers possibly could be better prepared to educate African American children. Another component, situated pedagogies, views the relationship of the teacher preparation program to the community in which the program is located or where their graduate may work. By returning to the classroom of experts, a common belief and practices system could be examined. By collecting and utilizing this information teachers would have an opportunity to be prepared to teach students of color. —To prepare teachers to be successful with African Americans students, teacher educators must help prospective teachers recognize ways that race and racism structure the everyday experiences of all Americans” (Ladson-Billings, 2000, p. 211).

Sleeter (2001) reviewed 80 research studies to examine the preparation of pre-service teachers to work in underserved communities. The schools that were chosen to serve a large number of students of color. The problem was based around the premise that pre-service students of color bring more experiences to multicultural teaching than White pre-service students. The research suggests two methods to engage pre-service teacher in multicultural activities. One includes immersing the students in the community and the other is multicultural courses. The community-based program is more effective, but many programs use the later. Recommendations were made to follow the teacher in the classroom once the program has been completed in order to measure transfer of knowledge and practice.

Professional Development

According to Cousins-Cooper (2000), teachers should know the impact their behaviors have on students (p. 17). Professional development that involves motivation

and learning styles should be an on-going process for teacher learning. African American students learn in a nurturing environment (p. 19). Based on the swift changes that are occurring in the school demographics, teachers need the training in order to meet the needs of their students. The relational style in which African American students tend to learn should be used as an asset instead of a deterrent. The mathematics curriculum should be the same for all students. Watering down the curriculum hinders African American student even further. Professional development that addresses student's needs and learning styles would provide teachers with the necessary knowledge base in order to deliver an effective mathematics curriculum.

African American Learning Styles

A learning style is a process that is used habitually to for cognitive problem solving and showing one's knowledge and what they are capable of doing (Carter, 2003). Ramirez and Casteneda (1974) indentified two types of learning styles, field independent and field sensitive. Field independent learners are task oriented, prized on achievement, and competitive in nature. While field-sensitive learners prefer to work in groups and have a tendency to be quite social. School mathematics tends to be taught from a field independent perspective, which has been characterized as the learning styles that European Americans have (Gay 1978, Gilbert & Gay 1989). Because of this notion, many field-sensitive learners feel like failures, because the teacher does not meet their needs (Carter, 2003).

Stiff and Harvey (1988) characterized African American students as being field-dependent learners. African American students prefer descriptive models and view the

world of mathematics in context. They tend to value an instructional environment that fosters a cooperative group setting. Classrooms that do not foster this instructional strategy could be deemed as inappropriate for African American students to thrive (Stiff & Harvey, 1988). The mathematics classroom tends to follow the European educational value system, which is field independent. The field dependent learner needs support from classmates to foster a sense of security in the mathematics classroom. African American students must believe that you have faith in their mathematical ability in order for them to feel the need to be successful in the classroom and the validation that is sought must be attained from the teacher.

A quantitative research study conducted by Lleras (2008) was used to model inequality among course placement, student engagement, and academic achievement. There were 24,850 8th grade students within 1052 public and private institutions involved in this study. According to the findings, students in urban schools that demographics are predominately African American are at a huge academic disadvantage compared to students in other schools. “Less desirable habits and lower skills in middle school translate into even greater gaps in skills, habits, and achievement in high school” (p. 906).

Mathematics instruction that many African American students receive is not aligned to their cultural style or learning preference (Berry, 2003). According to Boykin (1979), African American cultural frame is person to person, emphasizing interconnectedness; whereas, European American cultural frame is person to object, emphasizing separateness. Having this understanding of African American culture can

help increase student learning and engagement in the mathematics classroom, since most classroom are field-independent oriented. African American students thrive on the kinesthetic learning modality; therefore, concreteness is needed to reinforce the learning of mathematics concepts (Shade, 1997).

Cooperative group settings, in the mathematics classroom, lend itself to the learning styles of African American students. Boykin (1979) discussed that African American children possess psychological behavioral verve, where they tend to engage in high level activities in or out of the classroom setting. Also, Cole (1998) identified four learning styles that are favorable among African American students: (a) person centered; (b) affective, (c) expressive; and (d) movement-oriented. This classroom setting allows for students to be communal, which fosters a team approach to learning.

In a research study by Malloy and Jones (1998), 24 African American 8th grade students participated in problem solving sessions that utilized talk-alouds as an instructional strategy. The students were interviewed about their solutions to the problems and their feeling about mathematics. Many of the students characterized their experiences as those similar to the literature on African American students. The students used their holistic reasoning along with the affective realm that included their attitudes about themselves as mathematicians, their needs, and the motivation to learn (p.160). The analytical part of the problems were evident, but did not have an adverse effect on the student's perception on themselves based on the mathematical outcome of the problem solving experience.

The *Principles and Standards for School Mathematics* (NCTM, 2000), which is considered a vision for mathematics education, acknowledges the needs instructional needs of African American students. The Process Standards, which complement the learning styles of African American students, focuses on how students should learn mathematics through problem solving, reasoning and proof, communication, connections, and representation (NCTM, 2000).

Teacher Efficacy

Teacher efficacy is simplistic in nature, but has surmountable implications in the classroom of African American students. Teacher efficacy is the extent that a teacher believes that he can impact student learning (Bandura, 1977). Teacher efficacy can be related to the achievement and behavior of their students in the classroom (Tschannen-Moran & Hoy, 2001). A teacher with high efficacy creates a risk-free environment in the classroom and takes responsibility for student's outcome. This classroom is family oriented and facilitates a communal environment (Love & Kruger, 2005). A teacher with low efficacy fosters a negative, non-relational classroom.

Sapon-Shevin (1991) describes how teachers deliver instruction that is directly correlated with their beliefs. "It is generally clear that we teach in certain ways because we believe in certain things" (p. 63). As a professor at the University of North Dakota, she taught a course entitled "Introduction to Teaching and Learning." This course had been taught as a pass/fail course. She decided to change the structure of the course. This change caused her to know her students better and be able to model the teaching behavior that they would need. Using the peer teaching model as an assignment allowed

her to know her students especially the quiet ones. She felt that a narrow view of students seemed to be a form of dehumanization (Sapon-Shevin, 1991). Teaching is reciprocal in nature. –As we teach, we change our students and ourselves” (p. 67).

Love and Kruger (2005) created a survey that measures teachers’ culturally relevant beliefs. Six schools, that served a large number of African American students, were surveyed. Participants included 244 teachers, paraprofessional, instructional specialists, principals, counselors, and media specialists in this descriptive correlational study. There were several findings in these studies that included –learning from students is as important as teaching them (94);” and –students need a quality education to move out of their community (94). In addition, the participants’ believed that students’ race, culture, and ethnicity is a factor when teaching. Their responses can be equated to culturally relevant teaching.

Strutchens (2000) discusses teacher expectations as they relate to the mathematics classroom. Teachers must face their beliefs and overcome what impedes them for reaching the African American student. The author feels that the pedagogy in the mathematics classroom can address some of the inequities that students face. Teachers should involve the parents for additional support. Teachers may have to be shown students with similar demographics who are successful in order –buy in” to the teaching strategies to meet the needs of African American students.

Lipman (1995) discusses culturally relevant pedagogy. Based on a previous study using ethnographic methods, she described three teachers using observations and interviews. Two of the teachers taught at a low-income school that was predominately

African American, while the other teacher taught at a “premier” school in which the school was predominately European American. All three teachers related to their students differently based on their personality, but all of them had the same results. Schools that are looking to reform and meet the needs of African American learners must be cognizant of who is teaching along with their belief system. The teacher’s efficacy can determine whether a child is successful in the classroom.

According to Jamar and Pitts (2005), “Teachers cannot be expected to change their beliefs, knowledge, and action based on a change process that consists primarily of the issuance of policy statements and the adoption of new texts” (p. 129). An urban teacher was selected to participate in this study by his administrators and peers based on his interactions with his students. Mr. Lee, a successful middle school mathematics teacher, had high expectations for his students. This included behavior and mathematics content. African American students thrive in classrooms that respect them as individuals. Participants were interviewed and findings showed that they wanted a mathematics teacher like, Mr. Lee for the upcoming school year. He expected them to participate and do their homework. While all of the students did not meet his expectations on a daily basis, he never lowered them. Mr. Lee made mathematics “accessible and understandable” for his students.

The Deficit Model

According to Nieto (2000), the deficit model is based on the assumption that some students are inferior to other students because of their genetic, cultural or experiential differences. Many novice teachers have been trained in this model and have

a low sense of efficacy as a teacher of underserved students (Carter, 2003). Teachers who engage in the underpinnings of this model view students who come from homes with problems or live in poverty stricken communities plagued with drugs or gang activity have deficits that cannot be overcome in the classroom.

The expectations of the teacher, along with teacher efficacy can be impacted by the deficit model. It can immobilize teachers because they believe that circumstances in the student's life prevent learning. This teacher believes that unfavorable situational factors such as a single parent family or poverty stricken neighborhood destines the student for academic failure; while believing the converse, a student who comes from a two-parent home with middle-class values will be academically successful. This teacher does not take responsibility for educating ~~all~~ "all" students.

The deficit model is present in some mathematics classrooms. Teachers with low expectations can limit a student's opportunity for learning in the mathematics classroom. This teacher engages students in low level activities that foster no problem solving acquisition. It is vital that teachers shed the deficit model and embrace the models of resilience which builds on the strengths of students (Carter, 2003). The models of resilience focus on high expectations for ~~all~~ "all" students. The high efficacious teacher believes that through their efforts students are successful. This teacher engages student's in meaningful mathematics that is rigorous and relevant to their needs.

Mathematics and the African American Student

Historically, African Americans have been deemed as academic under-achievers in comparison to their European American counterparts in mathematics. However,

research has shown that African American children bring the same thoughts in basic mathematical competencies as their European American counterparts (Ascher, 1983; Ginsburg, 1978; Ginsberg & Russell, 1981). The focus has been on the achievement gap; however, several gaps have existed: Literacy Gap, Elementary School Attendance Gap, High School Completion Gap, College Graduation Gap, Graduate and Professional Degree Gap, and the Income Gap (Anderson, 2007). —The Black-White achievement gap began over 200 years ago and during the better part of the past two centuries the achievement gap is much closer and less daunting than previous gaps” (Anderson, 2007, p. 2). Restrictive laws against educating African Americans have been at the forefront of the gaps. The U.S. Supreme court ended Jim Crow Laws with the ruling in *Brown v. Board of Education*; however, it was not until the late 1960’s that desegregation came to the South (Anderson, 2007).

Robinson (2000) states:

No nation can enslave a race of people for hundreds of years, set them free bedraggled and penniless, pit them, without assistance in a hostile environment, against privileged victimizers, and then reasonably expect the gap between the heirs of the two groups to narrow. Lines, begun parallel and left alone, can never touch. (p.74)

Ladson-Billings (2006) discusses the education gap in lieu of the achievement gap for African American students. The education gap is based on the historical gap, economic gap, socio-political debt, and moral debt. The compilation of over two centuries of no education for African Americans, more money spent educating students

in low poverty areas compared to those in high poverty areas, exclusion from the civic process, and no acknowledgement for actions that are known to be wrong have attributed to the education gap (Ladson-Billings, 2006).

African American students encounter difficulty in mathematics after attending school. In a longitudinal study of first grade students in Baltimore, Entwisle & Alexander (1992) found that the mathematics achievement of African Americans and European and Whites were almost identical. After two years of schooling, African American student's mathematical skills began to diverge. The change of the test scores over the summer were used to measure how factors in the home attributed to the loss of skills. Economically disadvantaged student of both ethnicities lost mathematical skills over the summer, but did a well if not better than more affluent students in the winter. Therefore, the mathematics instruction that African American students receive in the formal school setting is an obstacle to their mathematical success (Stiff & Harvey, 1988).

The construct of mathematics identity is the belief about one's (a) ability to do mathematics, (b) the significance of mathematical knowledge, (c) the opportunities and barriers to enter mathematics fields, and (d) the motivation and persistence needed to obtain mathematics knowledge" (Martin, 2000, p. 19). Because mathematics identity is a social construct, it important that African American students develop a positive identity (Leonard & Evans, 2008; Leonard, 2009; Martin 2007, 2009). Teachers can help students cultivate their identity by engaging in meaningful mathematics activities that encapsulate real-world application.

African American students are aware of their classroom environment and the impact that it has on their learning. In 2005, Randy Lattimore conducted a qualitative study in which participant observations and interviews to collect data from two African American mathematics students. The students discussed their perceptions of the mathematics classroom. Both of them stated improvements that could be made in order to meet their needs like more patience from the teacher. Learning styles, student expectations, and teacher's perception have an impact on the success of the African American learner in the mathematics classroom. The students wanted the teacher to make the mathematics challenging and engaging. The students were seeking more kinesthetic learning.

Masinglia conducted a qualitative study in 2002 in which twenty middle school students kept a mathematics log for one week. Prior to keeping the log, students were interviewed and asked their perceptions of mathematics and its uses outside of the classroom. The same interview was performed after the students kept the log. Findings showed that many of the students viewed mathematics as a course in school. Only three of the students had a broader view of mathematics. Students that do not engage in mathematics in context are unable to make the connections that are needed to bridge the mathematics classroom with the real world application of mathematics.

Opportunities to Learn

There have been great disparities in mathematics education for African American students. The opportunity to learn and investment in education are the keys to closing the achievement gaps (Anderson, 2007). According to Strutchens & Silver (2000), African

American students are less likely to have access to high quality math instruction that includes problem solving and technology (Flores, 2007). Access to experienced and qualified teachers is an issue in the mathematics classroom. Out-of-field teachers, who do not possess a minor in mathematics, are prevalent in urban schools.

Tracking students based on perceived ability has kept African Americans from high academic achievement in mathematics. According to Oakes (1990), African American middle school mathematics students are placed in remedial mathematics programs, which leads to learning fewer topics and low level skills. These low expectations lead to fewer opportunities for students to learn mathematics that is challenging (Flores, 2007).

The Equity Principle outlined in the *Principles and Standards for School Mathematics* (NCTM, 2000), recommends that all students must have opportunities to study, support, and learn mathematics. In order for all of the tenets of this principle to be met, there are some requirements: high expectation and worthwhile opportunities for all, accommodating differences to help everyone to learn mathematics and resources and support for all classrooms and all students (NCTM, 2000). This type of equitable environment supports the learning of African American students.

Culturally Responsive Pedagogy

Culturally responsive pedagogy is the ability of a teacher to respond his students by integrating elements of the student's culture in their instruction (Irvine, 2001). Culturally responsive pedagogy in the mathematics classroom can aid African American students. According to Malloy and Malloy (1998), African American students who have

acculturated into the dominate culture have more success in mathematics. The use of problem solving with real-world applications that are relevant to the student's culture is beneficial. This would allow students to see the importance of mathematics in their lives and ~~the~~ "the power to be part of the mathematics culture" (p.255).

Lane (2006) discusses culturally relevant pedagogy in which teachers engaged students in meaningful activities and connected to their prior learning by tapping into their students' strengths. Students were allowed to make cultural connections and construct their own knowledge in order to seek solution to social problems in the community. The focus was placed on the teacher and the ability to deliver instruction that is relevant to different cultures, despite their own background. This type of instruction can ~~produce~~ "produce students who understand and critique the social order and who develop strong cultural personality" (p.12).

Culturally Responsive Teaching

Culturally responsive teaching (CRT) is defined as using the cultural characteristics, experiences, and perspectives of ethnically diverse students as conduits for teaching them more effectively (Gay, 2001). Teachers that engage in CRT attempt to create a bond with the children by participating in their lives. The relationship with the student extends outside of the classroom into the community which includes sports activities, as well as, church (Ladson-Billings, ~~Foward~~ "Foward a Critical Race Theory of Education", 1995). According to Gay (2010), CRT includes the following characteristics: (a) it acknowledges the legitimacy of the cultural heritages of different ethnic groups as legacies that affect students' dispositions, attitudes, and approaches to

learning as worthy content to be taught in the formal curriculum; (b) it builds bridges of meaningfulness between home and school experiences as well as between academic abstractions and live sociocultural realities; (c) it uses a wide variety of instructional strategies that are connected to different learning styles; (d) it teaches students to know and praise their own and each others' cultural heritages; and (e) it incorporates multicultural information, resources, and material in all the subjects and skills routinely taught in school (p. 31).

Howard (2001) reported the interpretation of culturally relevant teaching of 17 students in a qualitative study. African American inner-city students were observed and interviewed. The students described their teachers and expressed that the teachers believed in them. For many of the students, this was their first experience with a teacher with the characteristics that they were able to describe. The teachers made the classroom feel —like home' This provided a school community relationship that the students were able to relate to. The students described their classroom as engaging. The teachers were able to provide the students with —cultural capital.” The students considered this to be effective teaching, because they were able to learn without compromising themselves and their way of learning. The culturally relevant teachers encouraged a group of learners in lieu of encouraging individual and competitive achievement (Ladson-Billings, 1995).

Tate (1994) discusses the importance of connecting the mathematics to the real world in which African American students live. This connection allows them to engage in culturally relevant pedagogy. Today, many schools struggle with engaging African

American students in the mathematics classroom. Traditional classrooms use routines and procedures to teach mathematics, which is not being related to real-world application or the culture of African American students. Tate (1994) based his article on the dilemma that Carter Woodson described:

And even in the certitude of science or mathematics it has been unfortunate that the approach to the Negro has been borrowed from a "foreign" method. For example, the teaching of arithmetic in the fifth grade in a backward county in Mississippi should mean one thing in the Negro school and a decidedly different thing in the white school. The Negro children, as a rule, come from the homes of tenants and peons who have to migrate annually from plantation to plantation, looking for light which they have never seen. The children from the homes of white planters and merchants live permanently in the midst of calculations, family budgets, and the like, which enable them sometimes to learn more by contact than the Negro can acquire in school. Instead of teaching such Negro children less arithmetic, they should be taught much more of it than the white children, for the latter attend a graded school consolidated by free transportation when the Negroes go to one-room rented hovels to be taught without equipment and by incompetent teachers educated scarcely beyond the eighth grade. (477-478)

Cultural Awareness

Students in the United States lag behind students in other nations in mathematics. Ladson-Billings (1997) cites that people openly admit their fear of mathematics, but will

not readily admit their inability to read (p. 698). Does mathematics have a culture? Mathematics is closely aligned with the ideals and cultural experiences of White middle class (p. 700). African American students thrive on cultural expressions that include rhythm, orality, communalism, spirituality, expressive individualism, social time perspective time perspective, verve, and movement (Boykin & Toms, 1985). These expressions are not part of the mathematics curriculum or classroom (Ladson-Billings, 1997).

According to Ladson-Billings (1995), there are three criteria the culturally responsive teaching must meet: an ability to develop students academically, a willingness to nurture and support cultural competence, and the development of sociopolitical or critical consciousness (p. 483). In order for African American students to thrive in the mathematics classroom, they need to know that they are valued as a student. If the home culture and school culture are different, students may struggle in the classroom. This difference can cause conflict between the teacher and the student, because the teacher lacks the understanding of the student's cultural norms. The instructional strategies coupled with behavior management system of the teacher can lead to a misunderstanding and lack of learning in the classroom (Delpit, 2001).

Curriculum and Instruction

Mathematics instruction is based on social norms. Stanic (1989) discusses equity based on the state of mathematics in his article. Reform in mathematics should include culture practice theory and critical theory for a fundamental foundation. Teachers must know where they lie in the continuum and be prepared to meet the needs of their

students. According to Stanic (1989), the connection between mathematics, equity, and the culture of the students is needed to analyze the relationship between the culturally discontinuity and social inequality that occurs in mathematics classrooms.

In order for culturally relevant teaching to be effective, the teachers should not compromise the mathematics content. In an ethnography by Murrell (1994), four middle school mathematics teachers used “math talk” to engage 12 middle school, African American males. Structured and informal group interviews were used to collect data, along with individual interviews of the school administration. The students engaged in math talk and were very vocal during presentations. It was found that the students had a superficial understanding of the mathematics language that was utilized in the classroom. The intended role of learner was not met during this study. Findings show that the teachers did not correct the student’s mathematics misconceptions in the problems that they worked. “Math talk” allowed the students to interact with one another, but the instructional strategy undermined the mathematics classroom and the ability of the students involved in the study. The learning of the students was compromised by the teachers, who thought they were engaging in an instructional strategy that was beneficial to the students. The use of the instructional strategy met the cultural needs of the students; however, the mathematics that the students needed to learn was totally negated.

Most desks in mathematics classrooms are arranged in rows and columns, which fosters whole-class instruction. The students are listening and watching the teacher work problems and then are asked to regurgitate the process by working the

problems in the textbook (Tate, 1995). This process continues every day. This approach to mathematics instruction is consistent with the findings of several studies (Fey, 1981; Stodolsky, 1988; Porter, 1989). Tate (1995) describes a different approach to teaching mathematics in which a teacher uses the concerns of the students to impact their community. Because the class was not mandated by state and district curriculum guidelines, students were able to solve real-world problems building on their experiences that negatively impacted their community. The students felt there were too many liquor stores in their community. This led to the students creating graphical representations that included fractions, decimals, and percents. They also incorporated other content areas, by reviewing city codes. The students were given an opportunity to present their findings to the city council, which resulted in the relocation of some of the liquor stores. The teacher based her instruction on the needs and experiences of her students.

Cultural Sensitivity

An ethnography was conducted by Wilson and Goldenberg (1998). This study discusses the plight of a mathematics teacher who struggles with dualism. In this study, Perry's schemes (1970) categories of dualism, multiplism, and relativism were used to describe the characteristics of the teacher. The study included the teacher and focused on 6 students over a 2 year period. Observations, interviews, and students' written work were used to collect data. Based on the study, the teacher's perspectives did not change, but he did make an effort to implement new strategies. His beliefs in the way he was teaching mathematics did not change. Little intervention was utilized to change the teacher's practices. Based on his teaching methods, his students are mostly disengaged

in the classroom. Students were most engaged when using hands-on activities. The teacher's comfort level with manipulatives, was a deterrent for use even though it would have been beneficial for the students. The teacher made an effort to change his method of teaching, but was unable to continue to do so. The teacher's beliefs system, guided his instructional practice, even though he knew it did foster a mathematics environment for the students.

Summary

The literature review affirms that past research does not address the needs of African American learners in the middle school mathematics classroom. Literature on effective middle school mathematics teachers of urban, middle school students of color remains a void in the research, as well. A common finding in the mathematics teaching research is effective teachers in elementary classrooms and the tracking of students in high school mathematics. This study identifies the personal characteristics of effective urban, middle school mathematics teachers of African American students, as well as, the instructional practices that are implemented in the classroom.

CHAPTER III

METHODOLOGY

Introduction

Educational research is a process to review, improve, or change the systems that are in place. A methodology should be chosen based on the topic being studied, the nature of the issue being addressed, the audience for the study and the researcher's personal experiences (Creswell, 2009). A researcher should use qualitative research to study a research problem when the problem needs to be explored; when a complex, detailed understanding is needed; when the researcher wants to write in a literary flexible style; and when the researcher seeks to understand the context or setting of participants" (Creswell, 2007, p. 51).

In this research study, six effective middle school mathematics teachers in an acceptable urban school district from four middle school campuses were interviewed. This interpretive qualitative study used the actual words of the participants to tell the story, thus providing a rich representation of the ideas presented. In interpretive research, the participants are seen as agents, who actively construct their own policies, societies, and cultures (Schwartz-Shea & Yanow, 2012). Creswell (2007) defined interpretive qualitative research as:

An approach to qualitative research that has become interwoven into the core characteristics of qualitative research. It recognizes the self-reflective nature of qualitative research and emphasizes the role of the researcher as an interpreter of the data and an individual who represents information. It also acknowledges the

importance of language and discourse in qualitative research, as well as issues of power, authority, and domination in all facets of the qualitative inquiry. (p. 248)

According to Creswell (2007), there are several common characteristics of qualitative research: natural setting, researcher as the key element, multiple sources of data, inductive data analysis, participant's meaning emergent design, theoretical lens, interpretive inquiry, and holistic account. The definition by Denzin and Lincoln (1994, 2000, 2005), characterizes the evolution of qualitative research from constructivist, to interpretivist, to social justice.

Qualitative research is a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world into a series of representations, including field notes, interviews, conversations, photographs, recordings, and memos to self. At this level, qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense or interpret, phenomena in terms of the meanings people bring to them (Denzin & Lincoln, 1994).

The Community

The community consists of 111 square miles and with constant growth within this area. Most of the schools are surrounded with HUD assistance apartments, while others are the mecca within a neighborhood filled with middle class homeowners. Many residents shop in local storefronts and depend on public transportation in order to be mobile. The 2010 Census paints a detailed picture of this district in which the median income for a family residing in this district is \$32,136. Approximately 17 percent of the

families and about 19 percent of the population are below the poverty line. About 24 percent of the population that is below the poverty is under the age of 18 and about 19 percent are over the age of 65.

The District

The urban district that was selected consists of 73 schools and serves over 63,000 students in the southeastern part of the United States. It has experienced large demographic shifts during the past three decades. Once a predominately European American district, the demographics as 2010 are as follows: 26.2% African American, 69.1% Hispanic, 2.2% White, .1% American Indian, and 1.4% Asian/Pacific. Also, in this urban district 84% of the students are on free or reduced lunch.

The district employs over 4,000 teachers which approximately 3,000 are females. The demographics of the teachers are as follows: 36.5% African American, 19.7% Hispanic, 41.4% White, .1% Native American, and 2.2 % Asian/Pacific. According to the 2010 Academic Excellence Indicator System (AEIS) report, the district holds an Acceptable accountability rating for state accountability.

Purposeful Sample

A purposeful sample was used to select participants for this study. In a purposeful sample, ~~the~~ inquirer selects individuals and sites for study because they can purposefully inform an understanding of the research problem and central phenomenon” (Creswell, 2007, p. 125). Patton (1990) writes:

The logic and power of purposeful sampling lies in selecting information-rich cases for study in depth. Information rich cases are those from which one can

learn a great deal about issues of central importance to the purpose of the research. (p. 169)

For this study, I interviewed six middle school mathematics teachers from a large urban school district. Each participant was assigned a pseudonym. The purpose of selecting middle school participants from the same urban school district was to discover if any emerging themes would develop from the information that was provided by the participants. “It is essential that all participants have experience of the phenomenon being studied” (Creswell, 2007, p. 128). The participants were initially contacted by telephone. Consent was given through the telephone conversation and a meeting was scheduled with each participant in which an information sheet and consent form was discussed and signed. Member checks took place via telephone, e-mail, or in person.

The purpose of selecting the participants from the same urban district is to discover if any from the trends will develop data that will be collected. The criteria for the selection of participants will be as follows: (1) middle school mathematics teacher, (2) currently serving or have served as a middle school mathematics teacher within the selected school district, and (3) teaching three or more years.

Positionality

In qualitative research, “the researcher is the primary instrument of data collection and analysis; the process is inductive; and the product is richly descriptive” (Merriam, 2009, p.14). I am the primary instrument. According to Lincoln and Guba (1985),

Naturalistic inquiry is always carried out- logically enough-in a natural setting. Such as contextual inquiry demands a human instrument, one fully adaptive to the indeterminate situation that will be encountered. The human instrument builds upon his or her tacit knowledge as much as, if not more than, upon propositional knowledge and uses methods that is appropriate to humanly implemented inquiry: interviews, observations, document analysis, unobstrusive clues, and the like. (p. 187)

The participants were the primary source of information. An interview protocol was used to guide the semi-structured interviews provided information related to the purpose of the study. The interview protocol consisted of the following main ideas to lead a robust, conversational type of interview: a) educational background of the teacher; b) interactions with African American students in the learning environment, as well as, n c) approach to teaching mathematics; and d) support outside of the classroom, which included but was not limited to parents, administrators, and colleagues. Follow-up interviews were conducted after review of the transcripts as member checks to allow for elaboration and verification of the voice of the participant. The open ended questions allowed participants to tell their story and the researcher to ask emerging questions.

Data Collection

The core of the research lies in the data, which was obtained through open-ended, semi-structured audio-recorded interviews that included emerging questions, which were transcribed, with each teacher. Prior to all interviews, each participant signed consent paperwork that was stored by the researcher. Data was gathered from additional sources

which include field notes and non-verbal cues. Probing was utilized through the use of emerging questions throughout the interviewing process. For clarification, member checks were performed by e-mail, in person, as well as by telephone. I was able to triangulate the data using the audio recordings, field notes, non-verbal cues and member checks.

Research Design

This research study employed qualitative research methods in which a case study approach was used to broaden the limited research base of the voices of effective middle school mathematics teachers of urban, African American students. The case study research method is defined by Yin (1984) —as an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used” (p.23). Through the use of a case study, I was able to examine the data closely within the context of the middle school mathematics classroom (Zainal, 2007). According to Creswell (2007), —case study research is a qualitative approach in which the investigator explores a bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information (e.g., observations, interviews, audiovisual material, and documents and reports a case description and case-based themes” (p.73).

In my research study, I was the primary instrument for data collection and analysis in the interpretive qualitative research method. —During data collection, the researcher does not further marginalize the participants, but respects the participants and

the sites for research” (Creswell, 2007, p.24). In their own words, the participants discussed how they teach middle school mathematics successfully to urban, African American students despite the challenges that evolve in the educational setting. Through the use of interviews, I was able to hear and interpret the voices of the participants. In interpretive research, human beings are not treated as objects (Schwartz-Shea & Yanow, 2012).

Complementary Data Gathering Techniques

Additional data was gathered using various strategies and techniques. Utilizing additional gathering techniques enhanced data collection and data interpretation. The use of audio recording, field notes, and non-verbal cues were used.

Audio Recordings

A digital recorder was used to record the interviews with the participants. “This practice ensures that everything said is preserved for analysis” (Merriam, 2009, p. 109). To provide continuity and allow the participant to be comfortable in their environment, the interviews were conducted at a location chosen by the participant. All of the interviews took place in a classroom setting.

The interview protocol (Appendix A) was created based on the research questions. “The interview protocol enables a person to take notes during the interview about the responses of the interviewee” (p.130). Each participant was asked questions using the interview protocol along with emerging questions based on the participant’s response to the questions. In order to connect with the participant and maintain eye contact, I memorized the questions from the interview protocol. —Memorize the

questions and their order to minimize losing eye contact with the participant” (Creswell, 2007, p. 135). The transcriptions were made from a digital audio-recorder. Then, typed and reviewed by the researcher and corrected as needed based on the member checks with the participants.

I maintained a filing and storage system that protected the anonymity of the participants. Pseudonyms were used during the audio recordings and the research study. All audio-recordings are stored in a locked file cabinet at Texas A & M University.

Field Notes

“Field notes should be highly descriptive” (Merriam, 2009, p. 130). They describe details and about the participants, behaviors of the participants, as well as the setting. (Merriam, 2009). The researcher recorded her feelings and thoughts. Field notes served as a schedule if it is necessary to have another interview session with the participants. Field notes were recorded in a journal during each participant’s interview. The field notes were transcribed after each interview.

Non-verbal Cues

Non-verbal cues were recorded in the field notes. Additional questions were asked based on the non-linguistic cues of the participant, which allowed me to interpret their meaning. According to Lincoln and Guba (1985), these non-verbal cues can include: kinesthetics, spatial relationships, use of time, probing, and pausing, volume, voice quality, accent and inflectional patterns, and touching. Emerging questions were developed based on the voice of the participant in the semi-structured interviews.

Trustworthiness and Credibility

–Qualitative research also has strategies for establishing the authenticity and trustworthiness of a study, strategies based on worldviews and questions congruent with the philosophical assumptions underlying this perspective” (Merriam, 2009, p. 211). According to Lincoln and Guba (1985), the criteria for building trustworthiness are credibility, transferability, dependability, and confirmability. The technique of triangulation was used in order to enhance the trustworthiness of this research study.

–Triangulation using multiple sources of data means comparing and cross-checking data collected through observations at different times or in different places, or interview data collected from people with different perspectives or from follow-up interviews with the same people” (Merriam, 2009, p. 216). The data that was obtained through transcribed audio recorded interviews, field notes, and non-verbal cues were triangulated. This procedure allowed for preservation of data. On-going member checks were performed to ensure the voice of each participant was heard. Prior to participation in this study each participant signed a consent form that ensured confidentiality and anonymity.

Member Checking

–This is the single most important way of ruling out the possibility of misinterpreting the meaning of what participants say and do and the perspective they have on what is going on, as well as being an important way of identifying your own biases and misunderstanding of what you observed” (Merriam, 2009, p. 217) .The participants verified the interpretation of the researcher in order to ensure the researcher’s interpretation was the voice of the participant. Member checks allowed the

participant to clarify or share additional information. The participants received transcripts to review. Follow up interviews were conducted as needed to clarify the interpretation that was made by the researcher.

Transferability

Lincoln and Guba (1985) have recommended transferability as the qualitative counterpart for external validity. —.if there is to be transferability, the burden of proof lies less with the original investigator than with the person seeking to make an application elsewhere. The original inquirer cannot know the sites to which transferability might be sought, but the appliers can do” (Lincoln & Guba, 1985, p. 298). Lincoln and Guba (1985) stated that “the naturalistic cannot specify the external validity of an inquiry; her or she can provide only the thick description necessary to enable someone interested in making a transfer to reach a conclusion about whether transfer can be contemplated as a possibility” (316). Detailed information was presented in this study, so that the reader will be able to apply or transfer the findings as he deems applicable.

Dependability and Confirmability

Dependability is the criterion substituted for reliability. —The naturalist seeks means for taking into account both factors of instability and factors of phenomenal or design induced change.”(Lincoln & Guba, 1985, p. 22). Confirmability, or objectivity, was used to analyze data and to construct findings that could increase what is known about effective middle school mathematics teachers. I demonstrated confirmability by maintaining detailed record of the inquiry process, copies of the audio recordings of the

interviews along with the field notes, and the hard copies of the transcribed interviews. All records were made available to participants upon their request.

Data Analysis

—“The process of data collection and analysis is recursive and dynamic” (Merriam, 2009, p. 153). Once the data was collected and transcribed, each interview was coded using open and axial coding. The codes were written on the each transcription and then placed in an Excel spreadsheet. —“Assigning codes to pieces of data is the way you begin to construct categories” (Merriam, 2009, p. 162). Once saturated, these codes became categories. Themes were identified based on the categories that were identified from the transcription. The themes were framed based on the responses of the participants during the interview using the questions from the interview protocol and emerging questions of the study.

Summary

Naturalistic inquiry approach was used to tell the participant’s stories and experiences of teaching middle school mathematics through the use of interpretive qualitative research in which, the researcher serves as interpreter of the data (Creswell, 2007). From these voices other middle school mathematics teachers can be informed about the ways to teach mathematics to African American students.

CHAPTER IV

FINDINGS

In this chapter, I will present the experiences of six effective, middle school mathematics teachers, who teach African American students in an urban, district, through the voices they shared with me. I used the actual words of my participants to tell their stories. Pseudonyms were used for the participants to ensure anonymity and confidentiality. I will approach the data analysis in the following way: a description of the participant's school and a profile of each participant including a review of the participant responses. This section will be followed by data analysis of emerging themes, concluding with an interpretation of the findings where the emerging themes will be presented.

Dedicated Middle School

Interviews were conducted with Ms. Learn-a-Lot Lisa, Positive Patty, and Radiant Ruby at Dedicated Middle School. The building was locked, because our interview was scheduled to begin prior to the school day. The participant opened the door for me and we greeted one another. I was asked to sign in. We proceeded to the teacher's lounge in order to pick up copies for the mathematics department. Once we had the copies, we proceeded to the classroom. As we walked down the hallway, I noticed the posters that displayed the accomplishments of the students. Also, student pictures were displayed in the showcases. Since it was an hour before school started, I could hear the echo of my heels bouncing off of the walls. Other teachers were entering the building; each person that we passed greeted us with a "Hello." Once we made it to the

classroom, which was print rich. There were mathematics posters on the wall along with words of encouragement. She had pictures of the mathematics department, students and her children. The room was exuberant and filled with school pride. There were pictures of the football team and the room was adorned with the school colors and the mascot. Instead of conducting the interview in the classroom, we moved next door to the math office. This way there may be minimal distraction or interruptions. The office was filled with math books, calculators, and math manipulatives. Everything was organized neatly in its place on the shelf. There were markers and chart paper, as well. I made a do not disturb sign to place on the door, prior to the beginning of the interview. That turned out to be a good idea, because prior to me finishing the sign a teacher entered the room looking for some additional materials.

Throughout the interview, there were brief interruptions. Because it was the beginning of the school day, we agreed prior to the interview that if the interview lasted the participant would continue to do hall duty, if the interview lasted until the beginning of school. As I intently listened to the morning announcements, there was warmth in the air. The principal recited the Pledge of Allegiance, the Pledge to the Texas flag and had the building pause for a moment of silence. Once that was completed the announcements were done by two announcers who were quite entertaining, as they gave information in the form of a talk show, Coach and Coach. Dates and meetings were given along with the expectations of classroom behavior and academics were emphasized. Also, the school's creed was read. This was an inviting environment to conduct an interview.

Once the first interview was completed, I headed to the front office. The emptiness of the hallway that I experienced upon entering the building was now filled with laughter and the shuffling of feet as students scurried to class. Once I entered the office, I was greeted immediately and asked if I needed any help. I quickly replied, “No, thank you” and I signed out. As I was leaving the building a parent, who was quickly greeted by the office staff, was walking in. The sun was bright and blinding, which was a different picture when I walked in the darkness.

Ms. Learn-a-Lot Lisa

Ms. Learn-a-Lot Lisa is a European American female, who started her teaching career as a language arts teacher. She taught high school and middle school. There was a shortage of high school mathematics teachers and she lacked three hours. She was approached by her principal to teach mathematics and taught mathematics under an emergency permit for one year. She enjoyed teaching mathematics more than language arts and completed her requirements to become a secondary teacher certified to teach mathematics. She was so enthralled with the field of mathematics; she pursued a master’s degree in math education. She has taught high school math for five years and middle school math for nine years. She was very calm and had a soothing demeanor. She smiled throughout the interview, especially when she referred to her students. The calming tone in her voice was relaxing and made me feel at ease as the interviewer. This teacher is very passionate about what she does.

In her estimation, her campus is 50% African American; however, her campus is 34% African American. When asked directly about the learning styles of African

American students in mathematics her first response was “all the kids are kids to me.” She finds that most kids work better in groups, which is something that she does in her class often. This is a strategy that she does not specifically use for African American students, but for all students. She found that making math relevant to African American students was one of her biggest challenges. Ms. Learn-a-Lot Lisa believes that supporting the students in and out of the classroom was relevant to building positive relationships with her students and often spent time attending her student’s extra-curricular activities. “I believe that a child, any child who believes you are truly interested in them and not just interested in their success in the math classroom but interested in them as a person will work for you.” By attending these extra-curricular events, she was able to establish relationships with parents, as well. In addition to attending athletic events, Ms. Learn-a-Lot Lisa used the student’s interest in sports as an instructional resource. Throughout her teaching career her administrators have been supportive. Her strategic approach with her administrators included a plan of action and evidence of supporting the instructional success Ms. Learn-a-Lot Lisa views professional development is important and that each teacher should be a life-long learner and change with the times.

Dedicated Middle School (REVISTED)

Later that week, I returned to complete two additional interviews with Positive Patty and Radiant Ruby. I was greeted in the front office by the secretary and I signed in. The office was moving at a faster pace, since it was the middle of the instructional day. There were parents waiting along with several students. Teachers were walking briskly

in and out and I was able to get a glimpse of the principal. The students were quietly moving throughout the hallway heading to lunch. I waited in the lounge, where I was greeted by several teachers, who invited me to sit down with them. It was as if I was not a stranger and was welcomed by all. The hospitality was a bit overwhelming, but I was able to see teachers that were happy to be at work and there was a family-like environment. As I excused myself to go to the participant's classroom, my tablemates told me to have a great day and I said, "Same to you."

Upon entering the first classroom, I heard a muffled sound of someone talking on the microphone in the cafeteria. The noise level immediately was softer, similar to an immediate decrescendo of a marching band. The classroom was print rich, with mathematics posters, inspirational messages, and student work. Family pictures adorned a bookshelf along with other statuettes. At the beginning the interview, the participant was nervous, but excited to sharing her story. She diverted eye contact until the conversation began. Once, the interview started Positive Patty seemed to become more comfortable over time. We laughed as the participant discussed the fact the students think, "She is old as dirt." This could be attributed to the doting picture of a grandchild that adorns a bookshelf. The passion for teaching could be heard through the participant's voice while detailing the activities and stories that have been shared with the students. The students shared their lives with the participant and over the years many students continue to stay in touch.

Positive Patty

Positive Patty is a European American female, who has been teaching mathematics for five years. She has a degree in business and economics and was in banking for five years. Prior to teaching she stayed home for twenty years with her children. Once her eldest child began college, she began substitute teaching. Many people, including the mathematics department chair, assistant principal, and principal, at the campus where she was substitute teaching asked her “why don’t you teach?” She worked as a bookkeeper at the school and after needing more money and much encouragement from others enrolled in an alternative certification program. She was hired on a Friday, prior to the first day of school, which was that Monday. She began teaching ESL mathematics. She always thought if she would teach, it would be language arts. Since she has been teaching mathematics she has a love for the subject and the more that she uses math manipulatives to explain mathematics, the more she gets excited about mathematics.

In her estimation, 49% of her campus is African American; however, her campus is 34% African American. She believes that garnering the trust of students in the classroom is important. Relationship building for students includes attending extra-curricular activities and provides an excellent opportunity to meet parents in a social setting. As an instructional strategy, she has found that a period of exploration and discovery enhances her African American student’s interest in the mathematics classroom. Positive Patty found her administrators to be valuable resources and as a constant source of encouragement. Because teaching mathematics is her second career

she values professional development and attends as much as her schedule allows. She recognizes her colleagues as valuable resources who contribute to her development. Although students may initially question her genius, Positive Patty believes maintaining a high degree of enthusiasm wins the hearts of her students.

Dedicated Middle School (REVISTED 2)

The hallway was filled with student work from various content areas. As I entered the classroom, I noticed that Radiant Ruby's classroom is very stimulating. It could be considered over-stimulating, based on the fact that it was print rich. There was very little of the wall showing, because of the motivational sayings and mathematics posters that adorned every inch of the wall. The room was colorful and bright, which was due to the windows. The blinds were slanted, so the sun beamed through slightly while the lighting in the room served as an enhancement to the natural light. As we begin, I complimented the Radiant Ruby on the room. There were personal pictures on top of the file cabinet, which was reminiscent of a proud parent. Also, there were pictures of students in which some of them were of the same student, but in addition to the school picture there were athletic pictures of that student, as well. This symbolizes a relationship between the student and the teacher. As we proceeded through the interview, Radiant Ruby shared numerous stories about the students. She wants her students to be independent thinkers and problem solvers not only for the sake of mathematics, but in order to achieve success in life.

Radiant Ruby

Radiant Ruby is an African American female, who has been teaching mathematics for 16 years. She was inspired to teach mathematics because of her math background not for the love of teaching kids. Once she began teaching she realized that she had a ~~r~~real passion for teaching kids.”

In her estimation, 35% of her campus is African American and the campus is comprised of 34% African American. She recognizes the limitations of direct instruction and uses hands-on activities to address the learning styles of her African American students. Radiant Ruby has identified that students have low expectations of themselves, based on previous experience in the mathematics classroom. She engages in classroom strategies that allow students to openly communicate through critical thinking about mathematics in a non-threatening environment. She uses scenarios that are relevant to the students to foster their communication skills while infusing real-world situations. She uses ~~o~~utside functions” as an opportunity to develop relationships with students and parents. There are times when she will eat lunch with her students and will attend weekend functions: ~~J~~ust whatever I can to let them know that it’s not just about what goes on in the classroom.” She deems relationships inside and outside of the classroom as relevant to the mathematics success of her students. She believes that she is supported by the district with resources that include books and professional development opportunities. Radiant Ruby has high expectations of her students and believes that failure of a student is not beneficial for either party; therefore, steps are taken by her and the student to foster success. That mathematics department in which she belongs

believes all students can learn this is also a mantra that she uses to continue to forge ahead in the mathematics classroom.

Hard Work Middle School

It was a busy day at this campus due to the limited parking that was available. The marquee displayed upcoming events on the campus in English and Spanish. Upon entering the building there was parents and students in the office. I was greeted by a student aide and asked to sign in the visitor log. I was asked who I was there to see, but before I could respond I saw Determined Destiny. As we began to head to the classroom, the bell rang and the hall was filled with scuffling feet, laughter, loud conversations among the students, but the reminder from teachers to “move to the right” were reminiscent of my days in the classroom.

Determined Destiny

Determined Destiny is an African American female, who has been a middle school mathematics teacher for 11 years. She became a mathematics teacher, because of her love for mathematics. Also, she feels that she is a patient person and that would be an asset as a mathematics teacher, since so many students struggle in this course. She always knew that she wanted to be a teacher, so she did so and specialized in mathematics to pursue her dream. She has a very mild disposition and was nervous in the beginning of the interview. As she began to share her story of becoming a mathematics teacher, she no longer was nervous nor soft-spoken. She felt very comfortable and began to use her “teacher voice” as she described lessons that she had taught and the success of her students. As she continued to answer questions, I found her

smile reassuring of her passion for mathematics and the students that she was charged with educating.

In her estimation, about 10% of the school is African American; however, her campus is 18% African American. Determined Destiny is an African American teacher who has a vested interest in African American students. The small population of African American learners does not inhibit her from addressing the field-sensitive learning style of the students. Determined Destiny believes in creating an environment conducive for learning by allowing students to feel comfortable asking questions. She also affirms her interests in her students by attending “different sporting events” in order to develop meaningful relationships with parents and students. Determined Destiny feels supported by administrators even when taking non-traditional approaches to learning. She varies instruction by incorporating appropriate technologies to facilitate learning. She actively engages in planning sessions with her mathematics team to ensure that they are planning an aligned mathematics lesson to meet the needs of their students. She understands the importance of using manipulatives that are readily available to the teachers in ways that are beneficial to her students. Also, she uses writing as a tool for her students to communicate mathematics. This allows her to support them in other content areas.

Shepherd Professional Development Building

This interview was held in a professional development building. I waited for the participant in the foyer of the building. We greeted one another with a smile. Creative Charles seemed at ease and was very excited to share his story. The room had tables and chairs, so upon entering I allowed the participant to choose a table to conduct the

interview. He was very relaxed, but once the interview began he seemed extremely nervous. After a few questions were asked, he felt a little at ease. He is passionate about what he does and it showed as he began using his hands as he spoke.

Creative Charles

Creative Charles is an African American male, who has been teaching middle school mathematics 19 years. He believes that all students can learn. He defines all students as “children of different races, different learning abilities, and learning styles.” He enjoys teaching mathematics. He seemed quite comfortable during the interview process and it seemed more like a conversation. He enjoys teaching all students, but he spends time with African American males building self-confidence through the use of real-world mathematics. His love of technology is evident and he knows that he needs those skills as a teacher to reach the 21st century learner. He is innovative and a risk taker in order to meet the needs of his students. He has confidence in his administrator to support him in his efforts to educate students.

In his estimation, the majority of his campus is African American, which equate to 50%, which is the actual percentage of African American students on the campus. In order to meet the needs of his African American learners he uses manipulatives for hands-on learning, animations in PowerPoint presentations, and cooperative group settings in order to allow his student to communicate mathematics. In order to make the mathematics curriculum relevant to his students, he uses real-world applications that include choosing a cell phone plan and purchasing cars. Creative Charles devised an instructional program that specifically targeted his African American male students,

because he wanted to set aside time in a non-threatening environment for students who may feel as if it is not “cool” to ask questions. School administration is very supportive and allows time and resources for full implementation of ideas from the mathematics department. In order to build relationships with his students, he prides himself on being consistent and following through with his word. He also attends “things that are important to them” like football games or other after-school events that the students may be involved in, which he feels that his students “take that to heart.” Creative Charles is often approached by parents outside of the classroom, who use this time to ask about their child’s progress. He is passionate about teaching mathematics as the day he began teaching; however, he realizes that the way that he teaches has changed in order to meet the needs of his students. Creative Charles has engaged in numerous professional development sessions that not only focus on teaching mathematics, but sessions that specifically discuss meeting the needs of African American learners. He believes that the mathematics classroom of the 21st century should look different than the traditional classroom that he grew up in with the desks in rows and columns and strives for the classroom of today on a daily basis.

Believe Middle School

The school was very inviting; the landscape included well kept flower bed with colorful flowers. Upon entering the building, I was greeted with smiling faces from behind a counter with a loud and boisterous, “Hello!” I replied, signed in and was escorted down the hallway. There were display cases adorned with student pictures and achievements, along with a showcase dedicated to the teacher of the year. This display

was different than what I had ever seen before, it not only featured the teacher's picture and subject area, but personal effects of the teacher. It had a personal touch with a football for the teacher's favorite sport. The bell rang and the classroom doors swung wide and out poured middle school students. The dead silence in the hall was soon filled with the scuffling of feet and the crescendo of voices and laughter. While being greeted by numerous students on my way, I quickly made it around the corner to the Noble Nicole's classroom, where I was welcomed by a smile and come on in. I was a little early, so there were students in the class for lunch tutorials. Many of the students were completing a project that was due the next day.

Noble Nicole

Noble Nicole is an African American female, who always knew that she wanted to be a mathematics teacher. She played school as a child and knew that she wanted to be a teacher, but decided her senior year in high school that mathematics was the subject that she enjoyed the most. She excelled in her mathematics course in college and her professors encouraged her to become a mathematics teacher.

In her estimation, 45% of her campus is African American; however, her campus is 34% African American. She believes in order for her African American students to be successful that she must show them that she genuinely cares about them and feels that trust is essential in the classroom in order for the students to begin to learn what she is teaching. Consistency and high expectations are exuded in the classroom from the beginning of the school year to the end of the year. Since failure is not an option in her classroom, she remains in constant contact with parents to share successes, as well as,

concerns in the classroom. Visibility is important, so she attends football, band, and other extra-curricular activities that her student's engage in to strengthen the trust in the classroom. She is supported by the administration that is limitless when it comes to the children's needs in the building. In order to prepare lessons, she plans with her colleagues in a mock classroom fashion so that they go through the lessons as students in order to have discussions framed around questions that the students may ask. She uses real-world applications of mathematics to teach concepts and focuses on the mathematics vocabulary and the communication. Noble Nicole openly admits the beginning of the school year is always tough and many students do not like her class because of the rigor that she expects. After about four weeks, her students have adjusted and they enjoy her class just as much as she enjoys being their teacher.

Analysis of Findings

In interpretive research, human beings are understood not as objects, but as agents" (Schwartz-Shea & Yanow, 2012). The following section focuses on the responses of six effective middle school mathematics teachers of African American students. I began this study with two overall arching research questions:

- (1) How do effective mathematics teachers describe their personal characteristics attributed to success with African American students in urban, middle school mathematics classrooms?
- (2) How do effective mathematics teachers describe their professional acts of teaching as related to the student achievement of African Americans in the urban, middle school classroom?

Through the words that the teachers spoke, I was able to interpret how they interact in the classroom with African American, middle school, mathematics students, parents, their colleagues and administrators. For example, all six participants talked about various ways of teaching mathematics concepts, parental involvement, and working collaboratively as a team with their colleagues. The individual interviews of the six teachers allowed them to share their personal stories related to the instructional strategies in the middle school mathematics classroom and the relationships outside of the classroom that foster effective teaching of African American students.

Although the intent was to distinguish personal characteristics and professional acts of teaching, the emerging themes intersected, resulting in a combined overarching analysis. As shown in Table 2, three major themes emerged from the data, which include (1) Relevant Teacher Practices, (2) Support³, and (3) You Care, I Care. There were eight sub-themes that emerged under the major themes. Keeping Them on Task, Hands-on Mathematics, and Relevant Mathematics were sub-themes under Relevant Teacher Practices. Administrative Support, Collegial Support, and Parental Support were sub-themes under Support³. Relationships and Relevancy were sub-themes under You Care, I Care.

Table 2, Themes and Subthemes

| Theme | Sub-theme |
|-----------------------------------|--------------------------|
| You Care, I Care | Relevancy |
| Relevant Teacher Practices | Keeping Students on Task |
| | Hands-on Mathematics |
| | Relevant Mathematics |
| Support³ | Administrative Support |
| | Collegial Support |
| | Parental Support |

The following sections will include emerging themes and sub-themes; direct quotes from the participants, an interpretation of the responses as related to the research questions; and conclude with support from the literature.

Relevant Teacher Practices

The emerging theme, relevant teacher practices, captures the instructional strategies of the participants of African American middle school mathematics students and was classified into three sub-themes which include (a) Keeping Students on Task, (b) Hands-on Mathematics, and (c) Relevant Mathematics. The following illustrates the

teachers' beliefs regarding the importance in pedagogical practices employed in their mathematics classroom.

Successful instructional strategies are essential for student success. Teachers make decisions that affect student outcomes on a daily basis. Through these practices students have the opportunities for success or failure. Effective teachers take into consideration the needs of their students and are equipped with strategies that meet the needs of the student population that they serve. Creative Charles is one of those teachers. Creative Charles' Response:

The only times that we don't work in groups is when we're testing, then I have the desk in rows. But other than that the kids, for the most part, are in groups.

That's what I do just about everyday. I just believe that students can learn from each other so I'm trying my best to create this community of learners by making sure that they're in co-ops.

Creative Charles uses instructional strategies that allow his students to work in collaborative groups. This fosters a classroom environment that allows that students to interact through effective mathematics communication. He believes that his students benefit from this type of learning environment and tries to do this on a regular basis in order for his students to be successful. Collaborative grouping practices allow students to communicate, which lends itself to the characteristics of African American learners. This classroom environment allows the acceptance of the students and uses their characteristics as an asset instead of being utilized punitively.

Keeping Students on Task

Students are stimulated by watching television, but the 21st century learner is stimulated by even more as computers, cell phones, and smart boards take over the classroom. The teachers in this study used innovative ways to engage their students in their own learning while maintaining a classroom free of behavioral interruptions, which could impede instruction. None of the participants have their classrooms arranged in traditional rows and columns. Based on the mathematics lesson, students are allowed to work in pairs or in collaborative groups of four.

Determined Destiny's Response:

I know a lot of African-American students their learning style is kinesthetic, they like to be able to get up and move so trying to incorporate that into the lessons as much as possible. Maybe, for example, this year going outside making a human number line for comparing and ordering rational numbers; ordering least to greatest with scientific notation and standard forms of numbers, things like that. To get them up and moving.

Determined Destiny works to meet the needs of her students. She believes in a non-traditional classroom, which allows her to take her students outside of sitting in traditional rows and columns to participate in mathematics lessons. She uses her students in her lesson to make meaning from them and keep them engaged simultaneously. She wants her students to learn the mathematics, as well as, apply the mathematics in real world settings.

Noble Nicole's Response:

I've noticed that African-American students, they're energetic; they like to move around, so they like to talk; they wanna be active so I do a lot of "think, pair, share" in my classroom. I use a lot of pairing activities. Everyday after we do a lesson I give them at least fifteen minutes to work with the pair where they get to actually communicate actively with each other and work on those problems, because sometimes the student can address the information a little bit better than the teacher can or they can get it across a little bit better than the teacher can to them because of their social dialect.

Noble Nicole allows her students to collaborate mathematically on a daily basis. This fosters an understanding between the students and allows them to become facilitators of their own learning. She believes that the interaction between her students is important for mathematical comprehension and capitalizes on her student's strengths.

Determined Destiny and Noble Nicole both allow their students to move in the mathematics classroom in order to foster learning. Determined Destiny is aware of the learning styles of African American students and allows her students to move and tries her best to incorporate movement in her mathematics lessons. She seizes the chance to take students outside of the building for movement opportunities. Noble Nicole uses the loquaciousness as an asset to their mathematics lessons while in the deficit model the teacher would see this as a major deterrent to learning environment. Noble Nicole also allows her students to move to foster the learning style of her African American

students. By allowing her students to talk to one another, she feels that it solidifies her student's learning through her role as a facilitator of learning.

Hands-On Mathematics

Manipulatives are used in mathematics to build conceptual understanding. Creative Charles, Ms. Learn-a-lot Lisa, and Determined Destiny used them in the mathematics classroom in various ways in order for their African American students to be successful. African American learners are kinesthetic learners. Supporting the learning styles of their African American students is important to them along with the success of their students. Ms. Learn-a-Lot Lisa focused on the needs of her students and found activities based on the interest of her students in order to facilitate learning with manipulatives. Creative Charles likes for his students to interact with one another; therefore, in addition to technology he uses manipulatives to help facilitate mathematics conversations in the classroom. The teachers are aware of the research and use this learning modality in their classrooms to meet the needs of their students and enhance the learning environment to that facilitates conversation and movement.

Creative Charles' Response:

To address the learning style for African-Americans I use a lot of visual aids as far as things they can see, I use a lot of animations through power points. I try to use a lot of hands-on manipulatives where they're interacting, either with graph and technology or some type of manipulative they can move or manipulate to catch a concept. I notice they like that better. Also I notice that more African-American enjoy working with groups or in cooperative groups so they get

excited about that so I try my best to keep the kids in cooperative groups during the lesson cycle.

Creative Charles knows that the learning styles of his African American students and uses this knowledge to teach numerous math concepts through the use of manipulatives. He likes for his students to interact during the lesson cycle or provides this opportunity as often as he can. The only time that his classroom is in a traditional setting, rows and columns, is for campus, district, or state assessments.

Ms. Learn-a-Lot Lisa's Response:

Well in addition to commercially made manipulatives, you know, Cuisenaire rods, pattern blocks, colored tiles, we would do some that were, that the boys would make, we did the, fraction pieces or circle wrap pieces out of the paper-plates. The boys actually had true/false sticks that they would use if we would do some things, just calling out like yes/no questions or true/false, ah, they made their own, that way they could decorate it the way they wanted but they had a big --F or a big --F one side or the other, and they liked to use those. We actually had, that year, made some yellow flags that were our penalty flags and the boys liked to use those a lot in their group work. They felt that if somebody was either off task or not working to the group, you know, hindering the group in any way we allowed them to throw a flag and that was the alert that they needed some help from one of the two teachers so they enjoyed making their own manipulatives but we also did a lot of things with just--commercially.

Ms. Learn-a-Lot Lisa uses multiple manipulatives in her classroom. She uses teacher and students-made manipulatives in addition to commercial ones to encompass a classroom to meet the learning modalities of her African American students. The use of various manipulatives gives her immediate feedback on the progress of her students. For example, the use of the penalty flags promoted student ownership of learning, and as an indicator for the teacher that the students needed more clarification from her. Ms. Learn-a-Lot Lisa believed that her students would benefit from the hands-on learning that took place in her room. She used it for mathematically content and extended the use of the penalty flags to promote positive behavior during group activities.

Determined Destiny's Response:

Manipulatives, hands-on is always great for everybody but especially for African-American students so they have something to touch, feel, to move around.

Determined Destiny, too, believed that hands-on learning in the mathematics classroom was instrumental in the learning of her African American students. Remember, she promotes movement in the classroom along with the use of math manipulatives. She has an understanding of a mathematically rich classroom and glamorizes it to foster learning.

Relevant Mathematics

In the wake of accountability, mathematics is being funneled down students' throats with little understanding. The participants in this study make meaning for their students in the mathematics classroom by making connections to "their world." They did

this by making lessons that included the mathematics concepts that are needed for them to be successful and relating it to the 21st century learner. They recognize the differences between the two worlds that they were trying to connect and embraced the nuances and made changes as needed in order for their children to be successful. Although it was challenges at times, the participants put the needs of their students first in order to make the mathematics meaningful to a generation at times, decades younger than they.

Ms. Learn-a-Lot Lisa's Response:

I think that goes a lot of ways with kids in general, you know, trying to keep things relevant to their world. There's a difference between real world math and their world math, because real world math isn't necessarily where they are yet. They don't pay rent and they don't, you know, some of those things like that. So as far as challenges, I think it would be trying to find things that would be relevant to them. What I taught my all-boy class, those were, for the most part, athletes and a good number of them were African-American, it was a little easier because everything I taught them I knew they were interested in, in sports and we made everything relevant to, not always the sport they liked the best, but in some way to athletics and sports.

Ms. Learn-a-lot Lisa realized that there was a difference between the reality of math and the reality of her student's world. Some of the mathematics concepts are abstract, because the students do not engage in these activities like adults and do not deem them as important. Although, admitting that this is a challenge, she used sports to engage a group of students that were athletically inclined. She has taught other classes

and discussed using African American history to engage her students who were not into athletics. She believes in her students mathematical abilities and hones into their interests to strengthen conceptual understanding.

Creative Charles' Response:

One strategy that I try to use is to make sure that the ideas that I use for a particular lesson is very relevant to them. For an example, only yesterday we talked about simple interest. And so the core of the lesson was purchasing an H2 Hummer, ok, and so we calculated just using the simple interest formula, how much the interest would be on a Hummer and I had an animation of a Hummer and then the next thing I showed was a stereo system. I told them we wanted to get a stereo system so we talked about getting a loan. So I think when you use real life situations that connects with them and they like the Hummer that I animated, they immediately connected, you know, they bought into it and so they were really excited about trying to figure out how much would it cost me to get a loan for a super sound system. Then the next activity was: we want to buy some fancy wheels, and so they were really eager about seeing how much it would cost; to figure out the loan and the interest on buying wheels. So I think it is the topics that you choose that connects with them.

Creative Charles uses real-world experiences to bring mathematics alive and relevant for his students. The 21st century learner is welcomed into his classroom and he utilizes real-world concepts to increase student engagement. He believes that the topics that he chooses to teach mathematics should connect with the students, which will

increase their eagerness to learn. Often his lessons take hours to prepare, but he relishes in the successful outcome of his students through the way they are able to communicate the mathematics that they have learned.

Support³

Support³ captures the support that the participants receive in order to meet the needs of their African American students and was classified into three sub-themes which include (a) Administrative Support, (b) Collegial Support, and (c) Parental Support. The following section illustrates how collaboration is essential and fosters a professional learning community in order for the teachers to meet the needs of their students. The teachers met regularly with their administrators and colleagues to discuss best practices to meet the diverse needs of their African American students. They found the parents to be supportive in the endeavor of creating mathematically literate students.

Administrative Support

Support was prevalent through the stories of the participants. The teachers in my study stated that the administrative staff on their campus was extremely supportive. Three of the participants have an administrator who was a mathematics educator and allows them the autonomy to have their classroom in a non-traditional setting on a daily basis. They are allowed to bring ideas directly to the principal and those ideas are taken into consideration to meet the needs of their students. The open door policy that was described made the participants feel at ease about trying new lessons and embracing the use of hands-on learning and technology because they are able to troubleshoot with the

administration. The support that each teacher received was an added incentive for them to continue meeting the needs of their students.

Ms. Learn-a-Lot Lisa's Response:

I have never had a problem with not getting support from an administration. I've only worked in my twenty two years under three different principals, but every time I would go to the principal for, you know, to ask to do something or to ask for support I was always told yes, but I generally would go in with an outline of what I wanted to do and I would back it up with, you know, this has been done before and it's worked with my athlete class. I knew that the president had just signed into law that you could have gender specific classes within the public school classroom. Up until that point it was not allowed unless it was a charter building so I always go in, I guess, armed and ready so to speak with any questions that might come about but, they've always been more than helpful in working with me, and actually than even in asking how things are going as the year goes on.

Ms. Learn-a-lot Lisa believes that a supportive administration has allowed to make the strides with her African American students. She wanted to teach an all male mathematics class and approached her principal with the facts that she needed. Without the support of her administrator, she knows that would not have been possible. As the teacher of record, she cared about the welfare of a student group in order to request a class that she would specifically designed to meet the mathematical needs of males. She requested students who were not mathematically acceptable in the past. Based on the

criteria she set, the class was 95% African American male. Her tenacity and love for mathematics teaching keeps her at the forefront of what is taking place in the country. She continues to find ways to make mathematics come alive for students who have been unsuccessful in the mathematics classroom.

Radiant Ruby's Response:

They're very supportive. If there is an idea worth—something that as a classroom teacher I could see that could benefit the school, the kids, it is definitely accepted; it's welcomed and we give it a try. There's lots of support.

Radiant Ruby, too, has taught an all male course in which 90% of the class was African American males. She volunteered to be the mathematics teacher on a team of teachers for a male cohort. Being aware of the struggles of African American students in mathematics, she felt that she would be able to meet the needs of the students through hands-on learning and a cooperative group setting. Radiant Ruby does not have discipline issues in the classroom; however, knowing that discipline problems are a detrimental to the learning environment, she taught the class with the understanding she had the total support of the administration.

Creative Charles' Response:

Our administration is very supportive of mathematics. They're always asking and looking for creative ways for us to help increase our benchmark scores so just about anything that we need they're very supportive as far as getting us the supplies and the materials that we need to help our students to be successful. As a matter of fact we're getting ready to do a celebration for kids who have shown

leadership in mathematics this week and so our administration team--I gave them this idea and they said "run with it." They liked the idea and so this week we're gonna be celebrating kids who've been working hard at math and doing the right thing so that's one example of how our administration supports us.

Creative Charles felt that his administrator supported him as a mathematics teacher. He is able to take his ideas to his principal and get immediate support. His ideas for his students are revealed and used as a school-wide project. Increasing scores are the catalyst that is used by his administration. Creative Charles is able to get the materials that are needed for him to create the innovative lessons that are needed to engage his students. He believes that the administrative support that he receives allows him to meet the needs of his students.

Collegial Support

Teachers support each other on a daily basis. Collegial support means that teachers talk to one another, they share information that they have, and share stories with one another about how they teach. Some campuses have a designated time daily to meet, plan, and share. While other campuses meet before or after school in order to promote collegiality on the campus. Designated time to share among colleagues has been a key component in the instructional success of the teachers in this study. They use the time to plan lessons that instructionally aligned to the state curriculum, answer from their mathematics learning community and ask questions for clarification.

Radiant Ruby's Response:

We meet four times a week, we plan constantly; we do our lesson plans together so everyone is pretty much, if not on the same page, in the same general area at the same time. So we're able to feed off each other and get ideas from each other.

Radiant Ruby felt that is important to meet together to plan. Her department meets 80% percent of the time that is allotted for department planning. The conversations allow for instant feedback on a lesson and the mathematics department is able to be on one accord when it comes to the presentation of mathematics concepts. The ideas that they share allow for the flexibility in the delivery of aligned instruction to the students.

Positive Patty's Response:

I think that I am the only second career teacher in this department and so I get lots of good ideas from them as far as lesson planning; they have more of a resource from what they did last year that they can use from year to year that may be, as a starting point. And also just ideas of other ways to maybe handle a difficult situation with a child.

Positive Patty also felt that collegial support was important. She was a relatively new teacher and needed the support. Being a second career teacher she believed that the meetings provided her with the needed information to provide the demands of the curriculum based on the state's interpretation of mathematics. She feels that her colleagues have more to offer because they have been teaching mathematics longer, so

she considers herself a sponge. She leans on them for mathematics collaboration, as well as, advice on various classroom vignettes of middle school students.

Noble Nicole's Response:

We are still lucky to have department planning, so we meet every single day for fifty-two minutes with our department. Eighth grade meets with the eighth grade, seventh grade meets with seventh grade and we sit down and have a collaborative meeting together. We each bring a binder, in our binder we have our six weeks calendar, which shows us each TEACH that we need to cover for each week. We each are responsible for a day, for our lesson plans. We come together; we place all of the information down that we have and we go through it and we find the best activities for that lesson. We also, we do cut and paste a lot also as well, we model doing department planning for each other: If one teacher has trouble teaching this but one teacher excels in that we sit there and model for each other, how to teach it, how to get it across to our students. We actually pretend to be the students while the teacher is up there teaching, to ask them how and facilitate those questions with them. What other ways do we collaborate? We work really well together, that really helps us out a lot; we work very well together. We all understand we're here for the students; we go above and beyond. If we gotta tutor after school; if we have to pull during our lunch, during our conference, everybody is willing to do what they need to do.

Noble Nicole sees her time with her colleagues as truly a blessing in the wake of school budget cuts. Expectations have been defined in which all teachers bring a binder

with materials in order to plan for the success of students. She believes that her department planning time has been instrumental in her success, because it allows the department to go through entire lessons in order to make sure that mathematics concepts are captured in the lesson. The students take high priority and teachers spend time together to prepare for their needs.

Parental Support

Parents are an integral part of the education system and are a valued stakeholder. The parents and teachers forged an alliance for students to be successful in mathematics. The teachers sought out the support of their parents in order to make students aware that they care about them learning. Parent conferences took place at various venues, whenever the parent was seen. Many parents supported their children's extra curricular activities. Athletic events were well attended, so the teachers attended the events in order to meet parents to discuss student progress. In addition to games, teachers attended band and choir concerts and held math nights in order to show parents the mathematics that the students are exposed to on a daily basis. The teachers wanted the parents to feel welcome and were very appreciative of their support.

Radiant Ruby's Response:

Parental involvement this year compared to last year: Last year was the first year for this campus to be opened, and the parental involvement I would say was about maybe thirty to forty percent. This year it is up significantly to at least eighty-plus percent. The parents are more involved; they're more aware of what goes on at the school; the runnings of the school; the expectations of their

students and of the school and staff as well. So it's much better; I've seen a lot more parents involved in their children's education..... They know that as a teacher you know their parent and vice versa. So the parent can call me for anything; I can call the parent. Sometimes I'll have a parent's phone number on speed dial, and I'll call the parent immediately after class and we'll have a discussion if there was an issue, sometimes positive, sometimes negative, and the kids know that.

Radiant Ruby has seen parental involvement increase since the inception of the school. She willingly works with her parents and welcomes their assistance. She believes that more parents are becoming more involved in their children's education because they have a better understanding of the expectations of the school. She has formed a strong relationship with some of the parents and the students are aware that their parent can be contacted immediately after class with positive feedback and with words of concern. Maintaining student success and keeping parents informed is in the forefront of Radiant Ruby's educational pursuit for her students.

Creative Charles' Response:

Right now we have a strong parental involvement with our African-American students, and I'm saying that based on our attendance rate for our open house. We had several teachers to comment about how many parents showed up and how many parents had actually gone on to the parent portal to check on the student's grades, to check on the lesson plans to see what the kids are actually learning and we're even getting phone calls to our campus where parents are

asking the principal, can teachers can call them even more because they're expecting, they're looking forward to their phone calls. So we've noticed an extremely huge amount of support from the parents as far as wanting to know how their students or how their children are doing and how can they help.

Creative Charles believes that in addition to face to face contact that technology has increased parental support. Parents are taking full advantage of the opportunities to check their child's progress in the classroom and know what is being taught in the classroom by taking a bird's eye view of the mathematics lesson plans. It has heightened Creative Charles's interaction with his parents. Although he does not have a distinct number of parents that are viewing, he knows that the parents are using the parent computer that is available on the campus for their use, as well as, their own. Parents reach out to the school for numerous opportunities to be involved in the mathematics classroom.

You Care, I Care

Caring is not the topic of discussion in a classroom; however, the teachers in this study care about the children in their classroom. The participants did not see the students in their classroom as other people's children, but as their own. You care, I care captures the beliefs of the participants and was classified into two sub-themes (a) relationships and (b) relevancy. The following section illustrates how the participants' personal characteristics and interaction outside of the classroom had a positive effect on academic behaviors inside of the classroom.

Relationships

As students pass through classrooms from year to year, they can be seen as a number as opposed to a person. The participants made a concerted effort to make sure that their students knew that they were not only interested in their mathematics success, but was interested in other activities that they were involved in. The students knew that the teachers were genuine in wanting to know more about them and support them in other endeavors in school. The teachers built relationships with the students and their parents. Many of the students thrived in the classroom based on the new found relationship that was established.

Ms. Learn-a-Lot Lisa's Response:

Oh it has a great impact, I believe that a child, any child who believes you are truly interested in them and not just interested in their success in the math classroom but interested in them as a person will work for you. I've actually had students who said, you know, "Thank you for coming. I know this probably took you away from your children or your husband." So I think that they realize that you are doing something above and beyond for them and in that sense they're going to do the same and go above and beyond for you. I think you need to take an interest in the whole child, not just their mathematical mind or their mind in general. They're a person and, you know, we are not all gonna grow up to be math teachers so you need to take an interest in them and what their interests are as well.

Ms. Learn-a-Lot Lisa sacrificed time with her family in order to support her students, who realized and acknowledged their teacher's actions. She sees her students as little adults who realize that all of her students may not be mathematicians as adults, but want them to know that she is there for them and that they are important as people and as students. Her students are appreciative of what she does and knows that it is part of who she is and not something that is a requirement, because she is their teacher.

Radiant Ruby's Response:

First the belief that they can. A lot of the times some of the kids have been told that they can't. The expectations are not there and even if they haven't been told, because of those lower expectations the kids meet the low expectations. They don't even strive to become critical thinkers. or to think at higher levels, or even independent thinkers. They sit back and wait for someone to prompt them almost to the point of giving them the answer.

Radiant Ruby feels that she may be the first positive influence for some of her students despite the fact that the students are in middle school. She tries to inspire them through questioning strategies because she wants them be able to think. Many of her students have been conditioned and will not attempt to work problems. She believes that they can and she is aware that is a crucial component in building relationships with middle school students.

Noble Nicole's Response:

If they're football players, if they play sports I try to make sure that I attend some of their games so that they can see me actively watching them. If they play band I

try to show up to their extra-curricular activities, just to give them some support; let them know that I'm just not here for the classroom, I'm here to encourage you to do your best in everything that you do.

Noble Nicole attends extra-curricular activities such as sports events and band to show that she cares about her student's interests. She has high expectations for her students that permeate in and outside of the classroom. She wants them to excel in all of their endeavors and makes sure that she is there for her students. Active engagement is vital to Noble Nicole, so she is there just as she wants her students there in her classroom ready to learn.

Relevancy

As students ponder in the classroom the importance of mathematics, teachers are charged with teaching the curriculum that has been provided by the state. The students know that a state assessment is the culminating activity and after that is complete some of the students mentally check out. There is more to learning mathematics than taking an assessment and the teachers in this study show the relevance of mathematics through the lessons and activities that they chose to teach the state bounded curriculum. The task can be daunting, but the teachers know that the math must make sense to the 21st century learner that adorns their classrooms. Active engagement is important in the classroom and the teachers in this study use a non-traditional classroom setting and lessons that are meaningful to the students to make the math come alive.

Ms. Learn-a-Lot Lisa's Response:

You have African-American males who, number one who aren't into sports, who aren't into music, two years ago there was one of the hardest working student council members was an African-American male and had no interest in sports so I think sometimes we overlook those people and that was one thing. When I had the athletes obviously we did things, a lot with sports but I remember one time showing them a video with Colin Powell because I felt it was important that they see that there are African-American males that have gone on to things other than sports and music. I remember one time bringing in, I think his first name is Benjamin, Benjamin Banneker, a mathematician, African American mathematician and talked about, you know, "Look, here we have another African-American male who went on to even have a postage stamp made in his honor." So I think it is important that we hone in on the interests and if it's sports and music, fine, but not to overlook the fact that they're not all into sports and music.

Ms. Learn-a-Lot Lisa knows that all African American students are not interested in sports. She uses cross-curricular lessons that involve history to how relevance to the mathematics that she is teaching. Even though she had a class of African American males in which many of the students were athletes and she used numerous activities that were sports related, she wanted to expose them to other leading African Americans so that the students would have awareness more than sports.

Creative Charles' Response:

I think every year I've run into students who finally, you know, the light comes on as far as understanding mathematics for the first time. I know every year you run into some students who have never really just had a success in math. I don't think they've ever connected the dots, so to speak, and so, I think many times when that happens it is an instructional issue as far as the teacher connecting with the student and again that's knowing your clientele, knowing how to connect with your different students who have totally different learning styles. So I think with me, I find that I make that connection when I take a chance or take a risk doing an activity that maybe I'm not even comfortable with but it may help a kid who has this particular learning style. So I've seen it, and I've seen, and have heard, and have students come to me and testify how this particular activity, they call it.

Creative Charles has been teaching over a decade and has always had a student who was not been successful in middle school mathematics. He is prepared for the learning styles of his students and plans lessons that are engaging and relevant to his students. He aspires to make connections with his students even if it takes him out of his comfort zone. Creative Charles is a caring teacher who puts the needs of his students before his own.

Summary

All the teachers in the study believed that their students were capable of learning mathematics. They are lifelong learners, who constantly sought the support of their

administrators, colleagues, and parents to meet the needs of their students. Building relationships is the core of the success in their mathematics classroom along with strategically planned lessons to communicate mathematics to their students. Each teacher cared about the whole child by making sure that they were visible outside of the classroom at their students' extracurricular activities. The belief in their student's ability helped them persevere in the classroom in spite of state accountability testing.

Each participant focused on teaching mathematics with relevant lessons and activities that were geared to the learning styles of African American students. They believed in empowering all stakeholders especially the parents by making sure that there is open communication about the progress of the student. They are aware of the statistics in which African American students are low performing in mathematics, but that is not a hindrance to the day to day instruction that take place in their classrooms. They are committed to the challenge of teaching middle school African American, urban students.

CHAPTER V

**DISCUSSIONS, CONCLUSIONS, RECOMMENDATIONS, AND
IMPLICATIONS FOR FUTURE RESEARCH**

In this final chapter, I provide a discussion of the research study which includes the findings and relation to the theoretical framework. Next, I provide a conclusion by giving an overview of the findings for mathematics teachers of African American students in urban settings, K-12 stakeholders, and practitioners in the field of urban education. Finally, recommendations and implications for future research conclude this chapter.

Discussion of Findings

The study examined and interpreted the life experiences and teaching practices of six middle school mathematics teachers who teach African American students in a large urban school district. This study focused on the following research questions:

- (1) How do effective mathematics teachers describe their personal characteristics attributed to success with African American students in urban, middle school mathematics classrooms
- (2) How do effective mathematics teachers describe their professional acts of teaching as related to the student achievement of African American in the urban, middle school classroom?

The study used an interpretive qualitative study approach. The study was conducted in a large urban school district in which six mathematics teachers from four urban middle schools were interviewed. The participants' years of teaching experience spans from five

to twenty-two years. A minimum of three of those years were spent teaching middle school mathematics.

The literature review began with the importance of mathematics in the historical context. Then, I researched the current state of mathematics in the United States and urban schools. Teacher preparation programs were investigated in the literature along with the learning styles of African American students, teacher efficacy, and the deficit model. Finally, I looked at the literature related to mathematics and the African American students with opportunities to learn and culturally responsive teaching.

Data was collected through semi-structured interviews using an interview protocol, which was framed around the conceptual framework coupled with the research questions. The data was collected and analyzed through axial coding. An Excel spreadsheet was used to manage the coded data. The findings were categorized based on three major themes: Relevant Teacher Practices; Support³; and You Care, I Care. Sub-themes that emerged under Relevant Teacher Practices were: Keeping Students on Task, Hands-on Mathematics, and Relevant Mathematics. The sub-themes that emerged under Support³ were Administrative Support, Collegial Support, and Parental Support. Finally, Relationships and Relevancy emerged as sub-themes under You Care, I Care.

Relevant Teacher Practices

Relevant teacher practices emerged as a theme, as shown in Table 3, among all of the participants, and these instructional practices in the classroom allowed them to meet the needs of their African American students in middle school mathematics. They used effective classroom practices on a daily basis in an effort meet the adversity that

they sometime faced as middle school mathematics teachers. The non-traditional classroom arrangement, in which the desks were arranged in pairs or groups of four allowed for the students to work together in a non-threatening environment.

Table 3, Relevant Teacher Practices

| Keeping Them on Task | Hands-On Mathematics | Relevant Mathematics |
|--|--|---|
| <p>African American students thrive on cultural expressions that include rhythm, orality, communalism, spirituality, expressive individualism, social time perspective, time perspective, verve, and movement (Boykin & Toms, 1985).</p> | <p>African American learners flourish when teachers use hands-on mathematics, which is considered the kinesthetic learning modality (Shade, 1997).</p> | <p>Culturally responsive pedagogy is the ability of a teacher to respond his students by integrating elements of the student’s culture in their instruction (Irvine, 2001).</p> |

The sub-theme Keeping Students on Task is affirmed by the literature. Cole (1998) identified person centered, affective, expressive, and movement-oriented as learning styles that are beneficial to African American students. All six teachers in this study utilized practices that were specific to the learning needs of their African American students. Each teacher used at least two instructional practices to promote a learning culture conducive to producing mathematical thinkers. Noble Nicole allows 15 minutes daily for her student to move around and talk. The communication is structured

using the “think, pair, share” model. This instructional practice is applied daily to allow students to engage. Determined Destiny conveyed that based on particular mathematics concepts, she allows her students to move around during class.

The teachers were able to keep the 21st century learners, who are technologically savvy, engaged in classroom lessons and activities. The teachers allowed their students to move freely about the learning environment without any concern of classroom disruptions. The focus was on the teaching and learning of mathematics. They understood the learning styles of their African American students and used that understanding to plan aligned mathematics lessons and activities. The teachers used the story-telling nature of African American students as an asset to the learning environment. Students were allowed to communicate about the mathematics that they were learning to one another. Noble Nicole allowed her students to talk every day after she provided them with guided practice in order to solidify their understanding. She stated “I give them at least fifteen minutes to work with the pair where they get to actually communicate actively with each and work on those problems.” Noble Nicole realizes that the time that she allows them to communicate is instrumental in the success of the students.

African American learners flourish when teachers use hands-on mathematics, which is considered the kinesthetic learning modality (Shade, 1997). The sub-theme Hands-On Mathematics is supported by the literature in this review. All six teachers in this study employed some type of hands-on teaching in the mathematics classroom, which ranged from student made and commercial manipulatives to technology that

included the graphing calculator. Positive Patty is a “big fan” of the graphing calculator, because it allows students the flexibility in the mathematics classroom to use more critical thinking skills in lieu of being frustrated about the mathematical procedures and operations.

The teachers used hands-on learning in the middle school mathematics classroom through the use of math manipulatives to build conceptual understanding. Creative Charles felt that the use of manipulatives was a way to meet the instructional needs of his African American students based on their learning style. Ms. Learn-a-lot Lisa used teacher-made, student-made, and commercial manipulatives in the classroom to facilitate learning in her mathematics classroom. Determined Destiny felt that the use of manipulatives was a great way for all students to learn mathematics, but in particular for African American students, who are kinesthetic learners.

The sub-theme, Relevant Mathematics is affirmed in the literature. It is vital for African American students to develop a positive identity in the mathematics classroom, which is considered a social construct (Leonard & Evans, 2008; Leonard 2009; Martin 2007, 2009). Determined Destiny creates a risk-free environment in her classroom, which allows her students to have the opportunity to ask questions without fear. The teachers wanted the mathematics in classroom to be relevant to the students. Berry (2003) posits that many African American students do not receive mathematics instruction that is aligned to their learning modalities or culture. The teachers encompass real-world applications that the students are able to relate to. This includes purchasing vehicles or making choices on cellular carriers based on a budget.

*Support*³

Support³ emerged as a major theme from all of the participants and they all garnered the type of support that each of them received. All six teachers shared in the support that they received from their administrators, as shown in Table 4, in particular the instructional leader on the campus, the principal. They were able to bring ideas to the principal without fear of repercussions. This was important to them because of the innovative ways that each of them delivered instruction to meet the learning styles of their African American students.

Table 4, Support³

| Administrative Support | Collegial Support | Parental Support |
|--|---|--|
| “Schools have an obligation to ensure that all students participate in a strong instructional program that supports their mathematics learning” (NCTM, 2000, p. 13). | “Collaborating with colleagues regularly to observe, analyze, and discuss teaching and students’ thinking or to do ‘lesson study’ is a powerful, yet neglected, form of professional development in American schools (Stigler and Hiebert, 1999)” | “When parents understand and support the schools’ mathematics program, they can be invaluable in convincing their daughters and sons of the need to learn mathematics and to take schooling seriously” (NCTM, 2000, p. 378). |

—Schools have an obligation to ensure that all students participate in a strong instructional program that supports their mathematics learning” (NCTM, 2000, p. 13). The support that comes from the administrators, the instructional leader in a school, is pivotal to the success of a school. —Administrative Support” emerged as a sub-theme that

proved to be a factor that is supported by the literature. Four of participants found their administrators extremely supportive of their conviction of the mathematics classroom. Creative Charles is in constant communication with his administrator, who allows him to be innovative with the programs that he develops to meet the needs of his African American learners. Radiant Ruby believes that her administrators value her outlook on mathematics education, because she has the student's best interest at heart.

All six participants spoke about the support that they receive from colleagues; therefore, the sub-theme, "Collegial Support" emerged. According to the literature, it is a factor that is important, but often negated. The participants met with other department members on a regular basis to share lessons and activities. They take the time to work through the activities prior to teaching them to ensure their understanding in order to communicate the mathematics through aligned, effective instruction. "Collaborating with colleagues regularly to observe, analyze, and discuss teaching and students' thinking or to do 'lesson study' is a powerful, yet neglected, form of professional development in American schools" (NCTM, 2000, p. 19). The teachers garnered help from their colleagues through the sharing of aligned mathematics lessons and activities. They were able to meet in risk free environments and ask questions and model lessons. Positive Patty found this as asset since teaching was a second career and categorize herself as a new to the teaching profession. The commonality of working through the lessons prior to classroom presentation allowed them to feel prepared for their students and the possible questions that may be asked by their students. Noble Nicole saw this

time as sacred and a way to solidify the mathematics department as team, who worked together for the success of their students.

The sub-theme Parent Support is affirmed in the literature and all six participants garnered the support of their parents. Many of them had a non-traditional approach and contacted parents while attending the extra-curricular activities of their students. Some of the participants started conversations based on a family resemblance, while others saw the student with the parent. —When parents understand and support the schools' mathematics program, they can be invaluable in convincing their daughters and sons of the need to learn mathematics and to take schooling seriously" (NCTM, 2000, p. 378). The bridge among the teacher, parent, and community is strengthened by parental involvement and the visibility of the teacher in the community. The teachers in this study prioritized being visible in the community, as well as, being a partner with the parent in the educational success of the children due to their views that parental involvement is critical to the success of students.

Stakeholders are important contributors to the success of the educational process. The teachers found the support of the parents as pivotal in the success of their middle school mathematics students. The participants made a concerted effort to connect with the parents. The teacher-parent connection often took place outside of the traditional parent conference in the teacher's classroom or in the office of a campus administrator. The teachers attended numerous activities of their student to show them support and in turn this fostered support for the community. The teachers would often communicate at athletic events, as well as, various concerts. Many of the parents sought out support from

the teachers by contacting the school and welcoming more support. Radiant Ruby saw an increase in parental support and knew that she could contact parents anytime. She had a relationship with her students and parents that allowed her to contact them immediately. Radiant Ruby made a point to communicate both positive, as well as the usual parent contact of not completing homework and disruptive behavior.

You Care, I Care

You Care, I Care, as shown in Table 5, was a theme that all participants in the study exuded. Each teacher attended student's activities because each of them felt that it was important to build relationships with their students. The teachers knew that in order for the students to work efficiently and productively in their classrooms that it was important to establish relationships in particular with their African American students.

Table 5, You Care, I Care

Relevancy

According to Pang (2001), "caring teachers are willing to tackle painful inequities in schools and take hard looks at our own beliefs because we have made an ethical commitment to our children to make schools more relevant and effective for all kids" (p. 64).

Ms. Learn-a-lot students recognized and acknowledged that the time that she spends with them is taking away from her family. Her students are appreciative, but Ms. Learn-a-lot would not have it any other way.

Sapon-Shervin (1991) described how teacher beliefs have a direct correlation to the delivery of instruction. Radiant Ruby believes that her students can learn the mathematics despite their previous relationships in the mathematics classroom. This type of communication fosters a positive relationship with her students and they strive to meet the academic expectations that have been set in the classroom. The sub-theme, “Relationships” emerged and is consistent with the literature. All six of the teachers attend extra-curricular activities of their students. This action perpetuates a trusting relationship between the teacher and student (Pang, 2001). Radiant Ruby has had to deprogram some of her students’ attitudes in regards to mathematics learning, because some of her students had been told that they would not be successful in the mathematics classroom. She had to instill in them the belief that they could be successful and show them that they could be successful and her belief in them as strong students in mathematics. She believes that her students have had low expectations and raises the bar for them in her classroom. Both Noble Nicole and Radiant Ruby hold high expectations for their students and by attending their students’ activities outside the classroom they want their students to know that they are there for them both inside and outside of the classroom.

The sub-theme Relevancy emerged and is consistent with the literature. The teachers in this study responded to the needs of their students in numerous ways, which

included using a variety of instructional strategies based on the learning styles of their students. Also, they built a rapport with the students and the community. According to Gay (2000), this type of teaching follows the tenets of culturally responsive pedagogy. Creative Charles puts the needs of his students first in order for them to be successful. Ms. Learn-a-Lot spends time showing her students their potential by exposing them to successful African Americans without focusing on sports. She realized that all African Americans are not the same and do not have the same aspirations, so she found it notable to engage her students in relevant activities.

The teachers choose lessons and activities to engage their African American students based on their needs individually and collectively. In addition to meeting the state mathematics curriculum, it was important for their students to be engaged, successful, and enter a classroom that allowed them to have the opportunity to flourish based on their learning styles. Relevancy was a component that was used to plan lessons and activities. Creative Charles noted that mathematics learning in his classroom was about what was relevant to the students even if the aligned lesson took him out of his comfort zone based on the age difference between him and his students. Purchasing a Hummer was not a goal of Creative Charles; however, he knew that he could develop a lesson based on the mathematics curriculum from the state that would be engaging for his students. This is what drove him out of his comfort zone-making sure that his students received engaging, real-world, relevant lessons that turned on the mathematics light bulb.

Relation to Theoretical Framework

Culturally responsive teaching was used to support the research questions that allowed me to examine the experiences of six effective mathematics teachers of African American students in urban middle school classrooms. According to Gay (2000), the use of the cultural knowledge and prior experiences make learning relevant and effective for students of color. Also, the use of relevant lessons and bridging the home and school experiences of students allows for equity and the opportunity for students to learn. The focus of this study was to ascertain how effective mathematics teachers of African American students in urban middle school classrooms prepared their classroom lessons and delivered classroom instruction. Each of the teachers discussed the lessons that were designed to meet the interests and academic needs of their students.

Student engagement and providing opportunities to learn mathematics was a major factor in the teacher's daily routines. They believed their students could be successful and often times designed lessons that may have been out of their comfort zone, but were willing to do so to meet the needs of their African American learners. The participants spoke of the support that they received from their administration, as well as, their departmental colleagues. The use of real-world mathematical situations in which the students were highly engaged brought meaning the mathematics for the students. The teachers used manipulatives to enhance the learning experiences for the students in mathematics and support their learning styles.

The teachers in this study cared about the well being of their students. The whole child was revered as important and thus relationships were a driving force in the

mathematics classroom. According to Pang (2001), there are essential components of caring in education which include trusting relationships between students and teachers, as well as, between the teacher and the community. The teachers in this study believed in their students and spent time at their students' extracurricular activities to show their unwavering support for them outside of the four walls of the mathematics classroom. The teachers used this time to talk to parents in a non-threatening environment to gain their respect, trust and support in the academic partnership for mathematics success.

Conclusions

This study provides useful information to inform superintendents, administrators, teachers, and researchers of how effective middle school mathematics meets the needs of African American students in urban school districts. Culturally responsive teaching and the ethic of care provided the tools to shape my inquiry, so that I could examine the personal characteristics attributed to the success with African American students in urban, middle school mathematics classrooms and the professional acts of teach related to the student achievement of African Americans in the urban, middle school classroom.

I investigated the literature that I believed would be the applicable to the study of effective middle school mathematics teachers of urban, African American students. The participants in this study believed that their voice could be instrumental in making a change on how lessons and activities are structured to meet the needs of African American learners in the middle school mathematics classroom. The participants' conversations supported the past research, but gave a voice to the middle school mathematics classroom and the instructional practices that they used in order to meet the

needs of their African American learners. There were three major themes that emerged from the six middle school mathematics teachers. The themes were: (1) Relevant Teacher Practices, (2) Support³, and (3) You Care, I Care. Throughout the discussion of each theme are the answers to the study's research questions of:

(1) How do effective mathematics teachers describe their personal characteristics attributed to success with African American students in urban, middle school mathematics classrooms?

(2) How do effective mathematics teachers describe their professional acts of teaching as related to the student achievement of African Americans in the urban, middle school classroom?

Relevant Teacher Practices

Some important findings emerged from the analysis of six middle school mathematics teachers of African American students in urban classrooms. First, the teachers in the study imparted instructional strategies that met the needs of their African American learners. The teachers used math manipulatives, cooperative group settings, and a belief system that foster the nurturing environment in which their students needed in order to be receptive to the mathematics classroom. The teachers used manipulatives in their classroom which included student generated and commercial manipulatives, along with the use of technology to engage students in meaningful mathematics activities. The cooperative group setting allowed for students to communicate in a risk free environment. The students' loquacious mannerisms were not seen as a deterrent but as an asset, which did not interfere with the learning environment.

Support3

The support that the teachers received allowed for professional learning communities to be established that were supported by the campus administration. The teachers' ideas were valued and implemented in order to meet the needs of their African American learners. The teachers sought help when needed without hesitation from colleagues and administration. In order to meet the needs of their students there were often times when those needs were placed before their own preferred teaching style.

In the early grades, parental support is garnered and received. In the middle school setting, the parental support dwindles. The teachers in this study communicated with parents regularly in order to foster the school-community relationship. Parents saw the teachers as a caring partner in their child's education and appreciated seeing them outside of the classroom at football games and other school activities. The teachers believed in their students' abilities despite some of the mathematical shortcomings that they had incurred prior to coming to middle school.

You Care, I Care

The teachers in this study spent countless hours with their students in the classroom, but it was the time outside of the classroom that was most noticeable by the students, as well as, their parents. The teachers took time to build relationships with their students in order to show them that in addition to be important in the classroom that their welfare and interests outside of the classroom were vital too. Conversing with parents at extra-curricular events became second nature to them and the teachers used this as an opportunity to meet parents and engage in conversations that supported classroom

instruction. The teachers were able to garner the support of their parents and the students were aware of the relationship that their parent or guardian had with their teacher. The students were aware of the sacrifice that their teachers were making in spite of having families of their own.

The teachers in this study worked with students who had success in mathematics, but they also had the chance to work with students who had never been successful in mathematics and held a disdain for the subject due to their negative experiences. The teachers faced this challenge without fear and used their students' interest to make instructional decisions that would engage their students in the mathematics that they are charged with teaching and the students are expected to learn. Although there were times, when the teachers had to move from the traditional classroom with desks in rows and columns and allow their students to communicate mathematics and collaborate with one another in a group setting. The teachers communicated with their administrators that what they were doing was relevant and essential for their students' success in their classroom despite the non-traditional setting in their mathematics classroom.

Recommendations

There are research studies that have been conducted on the achievement gap and how African American students perform considerably lower on standardized testing than their European American counterparts. Many of the studies discuss mathematics teachers in general or focus more on the performance of students of color in the elementary grades. Middle school mathematics, specifically Algebra I, is considered the gatekeeper

to higher level mathematics courses, which open the doors of opportunity to many students.

The findings from this study have provided insights to the effectiveness of middle school mathematics teachers in urban settings. Middle school mathematics teachers of African American students should employ instructional strategies that are culturally relevant to their students. Allowing their students to communicate in a cooperative setting empowers them as mathematical learners. Also, utilizing manipulatives, hands-on mathematics, allows for students to learn mathematics kinesthetically. These two learning modalities are prevalent in African American students and have to be addressed in mathematics instruction to foster the learning of mathematics in the classroom.

The middle school mathematics teachers in this study made a concerted effort to make sure that their students know that they care. This was done through attendance to extra-curricular activities and high expectations in the classroom. The focus was building relationships, which is not required by law, but essential in cultivating a classroom climate that is conducive to the needs of middle school African American students in the mathematics classroom.

A supportive professional environment was vital to the work ethic of the teachers in this study. Many of them received help from colleagues and support from administrators. Planning time, in which the teachers were allowed the opportunity to share and model lessons in order to be prepared for the students, was a vital component

of their school day. Their administrators were sensitive to the needs of the mathematics department and allowed time daily for them to meet.

Implications for Future Research

Findings from this study describe how six urban, middle school mathematics teachers of African American students used culturally relevant teaching for student engagement. Also, the study showed that the participants spent time outside of the classroom to show support to their African American students in an effort to build relationships in the mathematics classroom. The participants in this study were highly efficacious, and did not hold the deficit model of thinking. Scholars can extend the research from this study. Some suggestions are listed below:

- 1) Conduct a qualitative study of effective teachers of Hispanic students in urban, middle school mathematics classrooms.
- 2) Conduct a qualitative study of effective male and female teachers of African American students in urban, middle school mathematics classrooms.
- 3) Replicate this study using the personal characteristics and acts of teaching of effective urban, elementary and urban, high school mathematics teachers of African American students.

This research study shows the personal characteristics and acts of teaching of six effective middle school teachers of African American students who attend urban schools. Despite the years of teaching experience, ethnicity, gender or background of the participants, they all are dedicated to their African American learners inside and outside

of the classroom. They are committed to teaching the whole, urban, African American, middle school student.

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APPENDIX A

Telephone Script

Hello, my name is Dametra Skinner. I am a graduate student from Texas A & M University conducting research about instructional strategies used in the middle school mathematics classroom.

The purpose of this study is to examine the life experiences and teaching practices of middle school mathematics teachers who teach African American students in an urban district. You were selected to be a possible participant because you have been teaching middle school mathematics at least three or more years in an urban school district. Your participation in this research is completely voluntary. This means that you do not have to participate in this research unless you want to. You will receive no direct benefit from participating in this study; however, the findings from this study may have an impact on instructional practices within the middle school mathematics classroom.

If you agree to participate in this study, you will be asked to complete two interviews that will be audio recorded. The initial interview will take approximately 30 minutes to an hour and the follow up interview will be 30 minutes to an hour. The follow up interview will be conducted within four weeks of your initial interview.

This study is confidential and your name will not be used. The records of this study will be kept private. You will be assigned a pseudonym; therefore, no identifiers linking you to this study will be included in any sort of report that might be published. This research study has been reviewed by the Institutional Review Board at Texas A & M University. If you have any questions about this study, you can ask me or contact the Institutional Review Board at (979)458-4067.

Do you agree to participate in this study?

If the participant's response is "Yes," then schedule a meeting to have participant sign a consent form and conduct an initial interview. Thank the participant.

If the participant's response is "No," then attempt to address the concerns of the prospective participant. If the participant changes his response then schedule a meeting to have participant sign a consent form and conduct an initial interview. Thank the participant. If the participant does not change his response, then thank the participant.

APPENDIX B

CONSENT FORM

Race to the Top: Hearing the Voices of Six Effective Mathematics Teachers of African American Students in Urban Middle School Classrooms

Introduction

The purpose of this form is to provide you information that may affect your decision as to whether or not to participate in this research study. If you decide to participate in this study, this form will also be used to record your consent.

You have been asked to participate in a research project studying instructional practices. The purpose of this study is to examine the life experiences and teaching practices of middle school mathematics teachers who teach African American students in an urban district. You were selected to be a possible participant because you have been teaching middle school mathematics at least three or more years in an urban school district.

What will I be asked to do?

If you agree to participate in this study, you will be asked to complete two interviews. The initial interview will take approximately 30 minutes to an hour and the follow up interview will be 30 minutes to an hour. The follow up interview will be conducted within four weeks of your initial interview.

Your participation will be audio recorded.

What are the risks involved in this study?

The risks associated in this study are minimal, and are not greater than risks ordinarily encountered in daily life.

What are the possible benefits of this study?

You will receive no direct benefit from participating in this study; however, the findings from this study may have an impact on instructional practices within the middle school mathematics classroom.

Do I have to participate?

No. Your participation is voluntary. You may decide not to participate or to withdraw at any time without your current or future relations with Texas A&M University or Aldine Independent School District being affected.

Who will know about my participation in this research study?

This study is confidential and your name will not be used. The records of this study will be kept private. You will be assigned a pseudonym; therefore, no identifiers linking you

to this study will be included in any sort of report that might be published. Research records will be stored securely and only Dr. Norvella P. Carter, and the investigator, Dametra N. Skinner, will have access to the records.

If you choose to participate in this study, you will be audio recorded. Any audio recordings will be stored securely and only Dr. Norvella P. Carter and the investigator, Dametra N. Skinner, will have access to the recordings. Any recordings will be kept for three years and then erased.

Whom do I contact with questions about the research?

If you have questions regarding this study, you may contact Dametra N. Skinner at 281-682-4955 or dnskinner@comcast.net.

Whom do I contact about my rights as a research participant?

This research study has been reviewed by the Human Subjects' Protection Program and/or the Institutional Review Board at Texas A&M University. For research-related problems or questions regarding your rights as a research participant, you can contact these offices at (979)458-4067 or irb@tamu.edu.

Signature

Please be sure you have read the above information, asked questions and received answers to your satisfaction. You will be given a copy of the consent form for your records. By signing this document, you consent to participate in this study.

_____ I agree to be audio recorded.

_____ I do not want to be audio recorded.

Signature of Participant: _____ **Date:** _____

Printed Name: _____

Signature of Person Obtaining Consent: _____ **Date:** _____

Printed Name: _____

APPENDIX C

INTERVIEWER'S GUIDE FOR TEACHERS

This qualitative study will use narrative techniques to gather and analyze data. Narrative analysis uses storytelling, which takes as its objects of investigation the story itself. The investigator will ask the participants to tell their story of becoming and being a teacher. The investigator will ask follow up questions to clarify and understand answers. Only my committee, Dr. Carter, and I will have access to the information contained in this study.

Some of the questions that will be asked on the participants will be:

1. Tell me your story about becoming a mathematics teacher and to teach in Aldine.
2. How do you feel about teaching mathematics?
3. What are the shared beliefs are there among the mathematics department?
4. Has there been a change in the demographics, since you started teaching here?
5. Paint a picture of what the demographics were when you first came here.
6. Paint a picture of what the demographics look like now.
7. What types of challenges have you faced since the change, if any?
8. How do your students feel about you?
9. How do you address the learning styles of your students?
10. For those who have problems, what are the special challenges you face in helping them learn?
11. What are some of your strategies in working with these students?
12. Tell me about the support that you get from the administrative staff.
13. Describe the resources you have for your teaching.
14. What kind of support and assistance do you receive from other teachers?

15. Tell me about the parental involvement and support that you get at your school.

16. Tell me about the staff development at this school and in the district.