

**PERCEPTIONS OF FIVE MIDDLE SCHOOL SCIENCE TEACHERS: A  
SUBURBAN SUCCESS STORY ON THE TEXAS ASSESSMENT OF  
KNOWLEDGE AND SKILLS ACHIEVEMENT FOR EIGHTH GRADE  
AFRICAN AMERICAN STUDENTS**

A Record of Study

by

CHERYL TURNER HENRY

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of  
DOCTOR OF EDUCATION

May 2011

Major Subject: Educational Administration

Perceptions of Five Middle School Science Teachers: A Suburban Success Story on the  
Texas Assessment of Knowledge and Skills Achievement for Eighth Grade African  
American Students

Copyright 2011 Cheryl Turner Henry

**PERCEPTIONS OF FIVE MIDDLE SCHOOL SCIENCE TEACHERS: A  
SUBURBAN SUCCESS STORY ON THE TEXAS ASSESSMENT OF  
KNOWLEDGE AND SKILLS ACHIEVEMENT FOR EIGHTH GRADE  
AFRICAN AMERICAN STUDENTS**

A Record of Study

by

CHERYL TURNER HENRY

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

Approved by:

Chair of Committee,	Gwendolyn Webb-Hasan
Committee Members,	Virginia Collier
	Patricia Larke
	Jim Scheurich
Head of Department,	Fredrick Nafukho

May 2011

Major Subject: Educational Administration

**ABSTRACT**

Perceptions of Five Middle School Science Teachers: A Suburban Success Story on the Texas Assessment of Knowledge and Skills Achievement for Eighth Grade African American Students. (May 2011)

Cheryl Turner Henry, B.A., The University of California at Los Angeles;

M.A., Stanford University

Chair of Advisory Committee: Dr. Gwen Webb-Hasan

The purpose of this qualitative study was to examine a problem of practice present in an actual school district. The study examined the achievement gap that existed between African American and European American students in eighth grade science. Over the course of one school year, the perceptions of five eighth grade science teachers and an administrative team's series of strategies were explored in a suburban middle school in Southeast Texas.

Since the enactment of the federal No Child Left Behind Act (2001), the achievement gap has been discussed and studied. However, few studies have investigated the strategies used by teachers to close the achievement gap for African American students who attend suburban schools.

This study examined the perceptions of five science teachers about the achievement gap at one suburban middle school, and identified and described the teaching methods and practices, aimed at closing the achievement gap as measured by

the performance of African American students on the eighth grade Science Texas Assessment of Knowledge and Skills (TAKS) test. Participants were the eighth grade science teachers at the chosen school. The results yielded a reduction in the achievement gap for African American students in eighth grade science on the Texas Assessment of Knowledge and Skills; 90% of the African American students passed the Science TAKS test in comparison to the 77% pass rate the previous school year. Member checking and peer debriefing were used to establish trustworthiness.

Recommendations for future study include a comparison of culturally responsive teaching and Quantum Learning (2008) strategies, as well as a replication of the identified strategies in the study to other suburban and urban schools, and districts.

## DEDICATION

To God, alone wise, be Glory through Jesus Christ forever. Amen.

(Romans 16:27).

This work is dedicated to my family:

First to the memory of my grandparents, Ezra and Frankie (Parker) Turner, and Joseph and Rosa Lee (Wright) Ray, who cultivated generations of success despite the obstacles of the segregated South;

To my parents, Morris Sr. and Doris J. (Ray) Turner who are my biggest fans and have always expected the best from me;

To my daughters Imani Saran and Jalia Taraja, you are the light of my life and the motivation for everything I do; and finally,

To my husband, Vernon; your patience, support and love has been my stronghold throughout this process. I love you with my life.

## ACKNOWLEDGEMENTS

“But do not forget to do good and to share, for with such sacrifices God is well pleased” (Hebrews 13:16).

What a journey this has been. There are many people to whom I am thankful and appreciative for their guidance and support:

My committee chair, Dr. Gwendolyn Webb-Hasan, served as a mentor and coach throughout this process. Beginning with our first summer, she set the example of professionalism, wisdom and endurance. The knowledgeable guidance of Dr. Jim Scheurich, Dr. Virginia Collier, and Dr. Patricia Larke throughout the preliminary exam, proposal and defense process served to be invaluable.

When the Cy-Fair Cohort began in the summer of 2007 a group of relative strangers became a family, connected forever. We began with 18 and 14 completed the course work leading to the Ed.D. During this journey we experienced good times, challenging times and some sad times. Through four marriages, four births, and even the loss of four parents, we have all supported one another and will continue until the last degree is awarded. I am thankful for meeting and knowing Jim Russell, Mindy Peper, Sylinda Howard, Mary Ellen Edge, Karen Rodriguez and Karee Gregg. My colleagues, Wanda Baker, Patty Mooney and Robin McGlohn, have shown tremendous support over the past four years; I am honored to call you friends. Jan Nell is the sister I discovered in my 40's; how can we be so alike? Jan and I worked well together on our very first group project and she provided invaluable support and information as I prepared for the

defense process. Additionally to my carpool brothers and sister, Dwayne McGary, Robert Long, and Kim Rhodes Monette, thank you for your unyielding support throughout the past four years. We made a pact when we met to finish strong – no matter what. We are almost there!

Thank you to my colleagues at Spotlight Middle School and at NISD:

Especially to Gary Kinninger, who was always supportive of me throughout this process by serving as a sounding board, resource, and even a courier;

Tracy Spaulding for always having a kind word to say and always willing to help me with whatever task needed completion; and for introducing me to her brother, Todd Kent Duckett, editor extraordinaire;

A special thank you to the science teachers who willingly shared their stories with me;

And to Dr. Leigh Elizondo who always reminded me that “no one knows your research like you do”.

Finally, I thank my family for providing tremendous support for me during this process. My sister, Linda Turner, always gave encouraging words; my brother and sister-in-law, Larry and Florence Turner, became the taxi service when I was promoted to principal; and my biggest fan, after my parents, my Uncle Norris, always told me “You should get your doctorate”.

My husband and daughters have been Patient, Kind, and Longsuffering.  
Thank you and I love you!



## TABLE OF CONTENTS

	Page
ABSTRACT .....	iii
DEDICATION .....	v
ACKNOWLEDGEMENTS .....	vi
TABLE OF CONTENTS .....	viii
LIST OF FIGURES .....	xi
LIST OF TABLES .....	xii
 CHAPTER	
I INTRODUCTION .....	1
Scenario .....	1
The Achievement Gap .....	4
Record of Study – Spotlight Middle School .....	7
Statement of the Problem .....	8
An Achievement Gap in Science at the Spot Light Middle School .....	8
Studying the Achievement Gap at the Spot Light Middle School .....	11
Research Questions .....	11
Background, Climate and Setting for Study .....	12
District-wide Professional Development .....	12
Summary .....	15
Definitions .....	16
Organization of the Study .....	17
II REVIEW OF RELATED LITERATURE .....	19
Introduction .....	19
Conceptual Framework .....	19
The Achievement Gap .....	19
African American Achievement and the Receiving Gap ...	23
Middle Schools Research .....	24
Middle Schools and Science Instructional Practices .....	27

CHAPTER	Page
Teacher Attitudes, Behavior and Actions as Related to African American Students .....	29
Culturally Relevant Pedagogy.....	32
Quantum Learning (2008).....	35
Summary .....	37
III    METHODOLOGY.....	38
Introduction .....	38
The Participants and the Setting.....	39
The Role of the Researcher and Data Collection .....	41
Data Sources and Context... ..	41
Data Collection.....	42
Data Analysis... ..	43
Ethics .....	47
Summary .....	48
IV    FINDINGS .....	49
Introduction .....	49
Spotlight Middle School.....	49
2009-2010 Academic Year.....	51
TEA Rating for Spotlight Middle School... ..	52
Planning for the 2009-2010 Academic Year.....	53
First Instructional Team Meeting – August 2009... ..	53
Focus for 2009-2010 Academic year.....	54
A Plan to Improve Instruction... ..	54
Participant Profiles .....	57
Teacher #1 – Ms. Michaels .....	57
Teacher #2 – Mr. Kelley .....	60
Teacher #3 – Mr. Ryan.....	61
Teacher #4 – Ms. Nichols .....	62
Teacher #5 – Ms. Kent .....	63
Research Questions... ..	64
Perception of Treating All Students the Same Regardless of Race/Ethnicity .....	65
Acknowledgement of the Achievement Gap .....	68
Teamwork Among Teachers .....	69
TAKS Warm Up Booklets .....	73
Team Use of Retired Science Teacher .....	74
Team Taking Responsibility to Teach Struggling Students..	74
Use of Quantum Learning (2008) .....	75

CHAPTER	Page
Building Relationships with African American Students .....	81
Building Relationships Through the Advisory Period .....	83
Taking Ownership .....	85
Training .....	86
Summary .....	87
 V DISCUSSION AND CONCLUSION .....	 89
Introduction .....	89
Relationship of This Study to the Research Literature.....	94
Perception of Treating All Students the Same....	94
Teamwork Among Teachers.....	95
Use of Quantum Learning (2008).....	96
Building Relationships with African American Students ....	97
Implications for Practice and Future Research .....	98
Current Practices at Spotlight Middle School .....	99
Future Practice.....	102
Recommendations for Future Practice and Research.....	106
What I Learned From This Study.....	106
Culturally Responsive Teaching... ..	108
Multiple Intelligences.....	111
Conclusion.....	112
 REFERENCES.....	 115
 APPENDIX A .....	 124
 APPENDIX B .....	 125
 APPENDIX C .....	 126
 APPENDIX D .....	 127
 VITA .....	 128

**LIST OF FIGURES**

FIGURE		Page
1	NISD Special Education Ethnicity .....	2
2	2008-2009 Discipline Incidents by Ethnicity .....	2
3	Gifted and Talented by Ethnicity .....	3
4	Percent College Ready Grads .....	4
5	Student Demographics Spotlight MS 2009-2010 .....	8

**LIST OF TABLES**

TABLE		Page
1	Overall District TAKS Results Comparison .....	6
2	NISD Annual Dropout Rate .....	6
3	Spotlight Middle School TAKS Results Grade 8 Only.....	10
4	Spotlight Middle School - All Grades TAKS Met Standard with TPM 2008-2009 .....	14
5	Participant Profiles .....	40

## CHAPTER I

### INTRODUCTION

#### Scenario

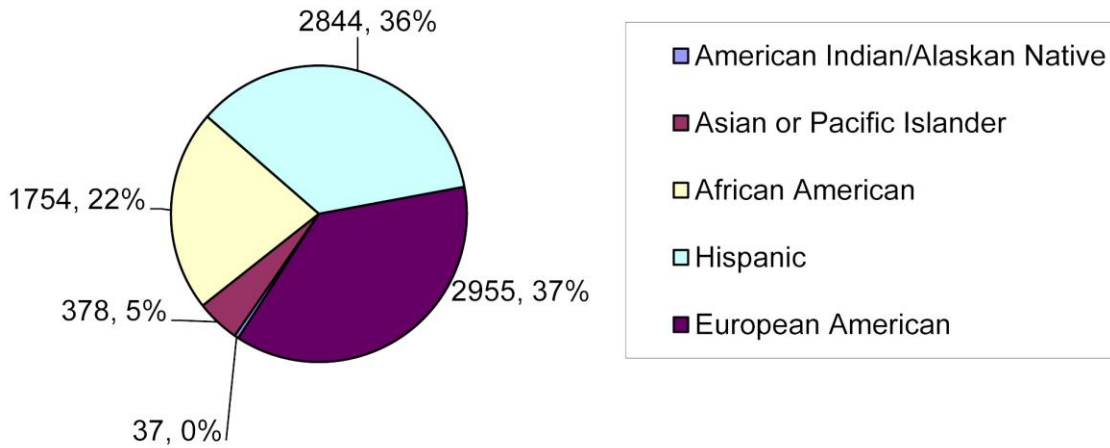
An African American family, the Richard Family, moved into a suburban community in Southeast Texas where the schools had fared well academically. The Richards moved from a large, urban area where their children, Keith, a middle school student, and Kristin, a high school student, had been academically successful. This was exemplified by each of them making the honor roll each semester, and participating in several extracurricular activities. The parents chose to move into the Northwestern ISD (NISD) area because the schools were newer and school district was rated recognized (the second highest academic rating) by The Texas Education Agency.

Once the academic year began and achievement data were shared with the community, the parents learned that African American students at both the middle and high schools scored significantly lower on the state mandated tests since the opening of both schools. Additionally, the parents learned that although there was less than a 10% population of African American students in each of the schools, district-wide the African American students represented 22% of the students enrolled in special education classes (Figure 1) and 29% of the discipline referrals (Figure 2). Additionally, they were often one of the few non-European American students in advanced level academic classes. In grades K-12, about four percent of all students identified as gifted and talented were African American (Figure 3).

---

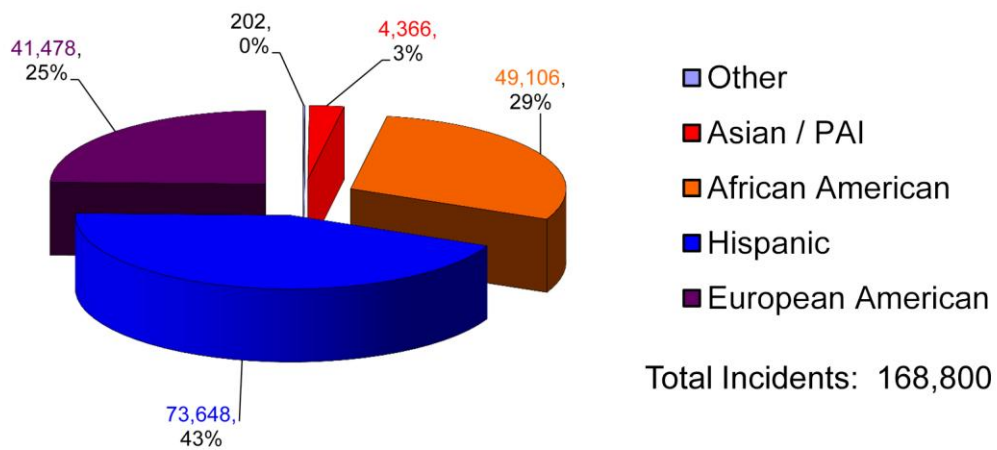
This record of study follows the style of *Urban Education*.

Figure 1  
NISD Special Education by Ethnicity



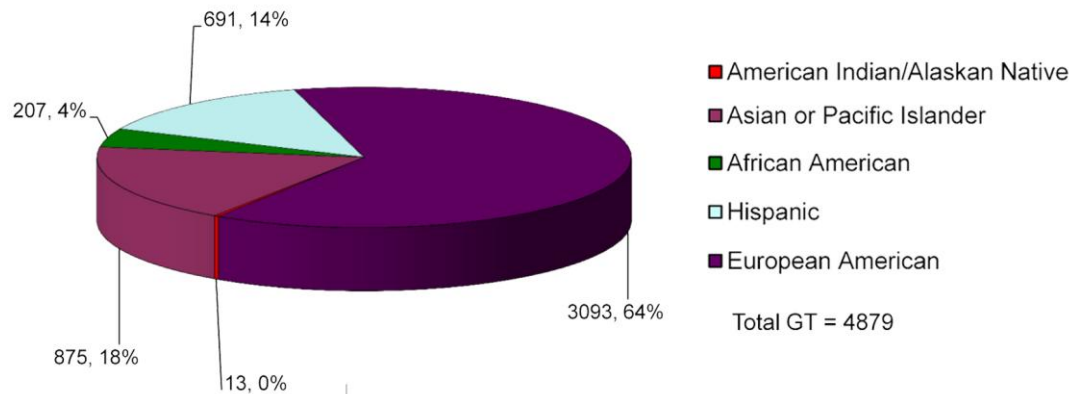
Source: NISD Special Education Department 2010

Figure 2  
2008-09 Discipline Incidents by Ethnicity



Source: NISD PBIS Office 2010

**Figure 3**  
**Gifted and Talented by Ethnicity**



Source: NISD Gifted and Talented Department 2010

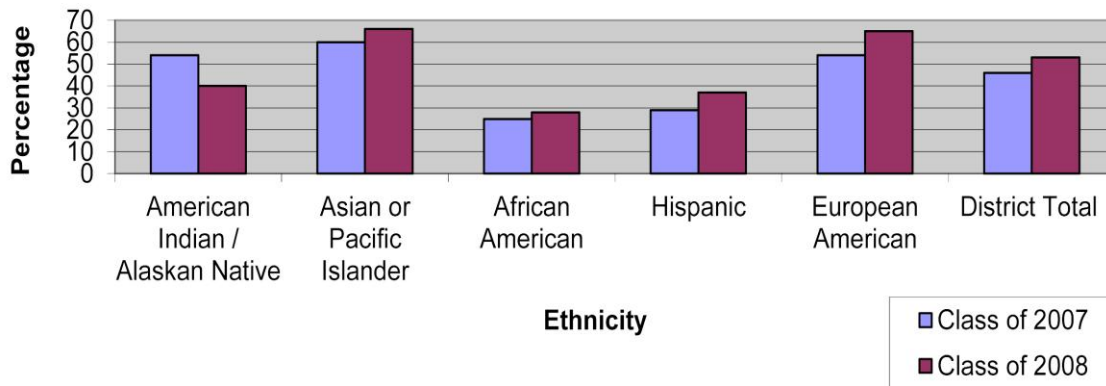
Moreover, African American students only comprised seven percent of the advanced placement (AP) high school classes, throughout the school district, in high school.

Furthermore, in 2008, only 28 % of African American graduates were considered college ready by the standards of the Academic Excellence Indicator System (AEIS) standards compared to 65 % of European American students in the district (Figure 4).

The newly arrived parents became concerned. How well would Keith and Kristin adapt to their new environment? Would the teachers give their son and daughter the same opportunities as other students? Would their children succeed academically and socially?



Figure 4  
Percent College Ready Grads



### The Achievement Gap

The above scenario is consistent with the characteristics of an achievement gap. Title I of the Federal No Child Left Behind Act of 2001 had a stated purpose of “improving the academic achievement of the disadvantaged” by enacting several items, among them, “closing the achievement gap between high- and low- performing children, especially the achievement gaps between minority and non-minority students, and between disadvantaged children and their more advantaged peers” (107<sup>th</sup> Congress, 2002).

An achievement gap is often characterized by lower scores on standardized tests, and lower academic grades. Additional characteristics of an achievement gap include higher rates of retention, drop-out and assignment to receive special education services (Becker & Luthar, 2002). Furthermore, an achievement gap is exemplified when African American students are under-represented in gifted, talented and advanced placement programs (Ford, Grantham, & Whiting, 2008).

On a national level an achievement gap exists between African American students when compared to their European American counterparts (NAEP, 2011). These patterns were similar in Northwestern ISD (NISD), a suburban school district in Southeast Texas. According to 2008-09 Academic Excellence Indicator System (AEIS) data for Northwestern ISD, African American students comprised 15 % of the student population. District-wide, African American students scored 11-16 percentage points below European American students on the Texas Assessment of Knowledge and Skills (TAKS) test in math and science, with the inclusion of the Texas Projection Measure (TPM).

During the 2008-2009 and 2009-2010 academic years TPM was used an indicator of a student's future success on TAKS. TPM was based on a student's performance on the TAKS test and the TAKS test scores of other students within their school (TEA, 2009). This measurement allowed the school to gain accountability points and resulted in an improved rating for the school. Prior to calculating TPM, the gap between African American and European students was 18 and 21 percentage points in math and science respectively, district-wide (Table 1). African American students had a passing rate of 76% in math and 73% in science.

Finally, the drop-out rate, another indicator of an achievement gap in Northwestern ISD for the 2008-09 academic year, for African American students was three times that of European American students (Table 2). African American students had a dropout rate of 1.6% and European American students dropped out at a rate of .5%.

**Table 1**  
**Overall District TAKS Results Comparison**

<b>Year</b>	<b>District Overall</b>	<b>European American</b>	<b>African American</b>	<b>European American/ African American Gap</b>
<b>Math (with TPM)</b>				
2008-2009	86	94	76	18
2008-2009	92	97	86	11
<b>Science (with TPM)</b>				
2008-2009	85	94	73	21
2008-2009	89	96	80	16

Source: TEA 2008-09 AEIS

**Table 2**  
**NISD Annual Dropout Rate**

<b>Year</b>	<b>District</b>	<b>European American</b>	<b>African American</b>
2006-07	1.10%	0.50%	1.60%
2007-08	1.10%	0.50%	1.70%

Source: TEA 2008-09 AEIS

While in my position as an educator and researcher I sensed most schools and districts had the desire to improve the achievement and completion levels of all students, including African American students. However, I additionally sensed that many districts and schools (including NISD) should consider alternate strategies while attempting to close the achievement gap affecting African American students so that families, like the Richard family, would worry less about how their children would fare in suburban schools.

### **Record of Study – Spotlight Middle School**

This record of study was a problem of practice. A problem of practice is used to define a specific existing educational problem. The problem is analyzed and interpreted based on relevant literature. Additionally, in a problem of practice, data is gathered, verified and the problem is explored within the context of a school or school district (Scheurich, 2009). In the process and as a result of studying the problem, Spotlight Middle School significantly narrowed the achievement gap between African American and European American eighth grade students in science.

Recommendations and implications for future implementation or study may also be included in a problem of practice (Scheurich, 2009). This record of study explored the ways in which Spotlight Middle School addressed narrowing the achievement gap in science when comparing African American and European American students. Additionally, a discussion of implications for further research and practices that may close the achievement gap for Northwestern ISD and similar school districts are included. This record of study increases the body of literature by reviewing and

analyzing teacher perceptions of their teaching strategies used to narrow the achievement gap between African American and European American students in eighth grade science in a suburban middle school.

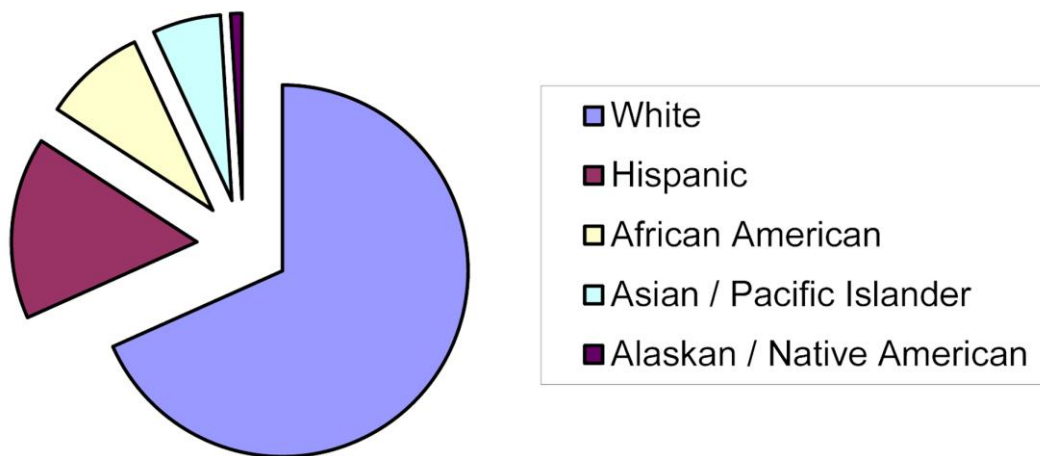
### **Statement of the Problem**

#### **An Achievement Gap in Science at Spotlight Middle School**

At the time of my research, Spotlight Middle School was recognized as a successful suburban middle school in Northwestern ISD (NISD) located in Southeast Texas. During the 2009-2010 academic year, the student population of 1700 was 69% European American, 16% Hispanic, nine percent African American, six percent Asian and less than one percent Native American (Figure 5). Spotlight Middle School was designated as recognized by the Texas Education Agency for both the 2007-2008 and the 2008-2009 academic years.

**Figure 5**  
**Student Demographics Spotlight MS 2009-10**

**Total Students = 1700**



In its first accountability year (2006-2007), Spotlight Middle School earned the rating of academically acceptable (second to the lowest academic performance rating). For the next two years the scores of the majority of the students equaled or exceeded those necessary for a rating of recognized or exemplary in all sub-populations, with the exception of math and science.

Over the next two years, 2007-2008 and 2008-2009 a gap in achievement existed for African American students in eighth grade on the TAKS test in math and science at up to 17 percentage points lower than the scores for European American students (Table 3). In 2007-2008, 90% of the eighth grade African American students at Spotlight Middle School passed the math TAKS, and in 2008-2009, 88% of these students passed the math TAKS. In the area of science, 83% of the eighth grade African American students at Spotlight Middle School passed in 2007-2008, and in 2008-2009, 77% passed in science.

During the 2008-2009 academic year, the Hispanic sub-population passed the eighth grade science TAKS test at a rate of 83%. They were the only accountability group, in all tested areas who did not score in the exemplary range. As a result, Spotlight Middle School earned the TEA accountability rating of recognized. The leadership of Spotlight Middle School were concerned about the 83% pass rate; however another phenomenon was at play

**Table 3**  
**Spotlight Middle School**  
**TAKS Results Grade 8 Only**

	<b>School</b>	<b>European American</b>	<b>African American</b>	<b>European American / African American Gap</b>
<b>Year</b>				
			<b>Math</b>	
2008-2009	92	94	88	6
2007-2008	93	93	90	3
			<b>Science</b>	
2008-2009	91	94	77	17
2007-2008	91	92	83	9

Source: TEA 2008-090

African American students at Spotlight Middle School comprised less than 10% of the tested population for eighth grade science. Only 34 of 527 tested eighth grade students were African American, therefore the African American sub-population did not meet the size standard for accountability on TAKS. The scores for the African American sub-population did not count for the 2008-2009 academic year. Consequently, only 27 of the 35 African American students passed the TAKS science test at a rate of 77%. If the African American subpopulation had counted as an accountability testing

group, Spotlight Middle School would have been rated academically acceptable by the Texas Education Agency (See Figure 4, p.3).

### **Studying the Achievement Gap at Spotlight Middle School**

Education Week (2004) defined the achievement gap in education as the “disparity in academic performance between groups of students” (p.1). In 2005, the National Governors’ Association referred to the achievement gap as “a matter of race and class” (p.1) due to the persistent gap in achievement between European Americans and non-European Americans and disadvantaged students. They asserted this gap as “one of the most pressing educational policy challenges that states currently face” (p.1). The difference in yearly science assessment scores between African American and European American students is one indicator that an achievement gap exists at Spotlight Middle School .

The purpose of this record of study as a problem of practice was to identify and study the gap in achievement for African American students at Spotlight Middle School in the area of science. Additionally, as the researcher, I examined the perceptions of science teachers about the achievement gap during the study year, and I identified and described the teaching methods and practices, as perceived by the science teachers, at Spotlight Middle School, aimed at closing this achievement gap.

### **Research Questions**

The following questions were examined during the research process in order to inform perceived and ongoing practices and make recommendations for future practices:



1. What were science teachers' perceptions regarding the achievement gap that existed for African American students in science at Spotlight Middle School?
2. What instructional practices did science teachers perceive they used to improve achievement for African American students in science at Spotlight Middle School?

## **Background Climate, and Setting for Study**

### **District-wide Professional Development**

*National Conferences.* At the close of the 2008-2009 academic year, NISD hosted a conference based on the Rigor/Relevance Framework (LeaderEd.com, 2010). Elementary and Secondary principals and instructional leaders from throughout NISD attended the conference. Keynote speakers from The International Center for Leadership in Education were highlighted as they presented best practices for school improvement. Additional sessions were presented by the Association of Supervision and Curriculum Development (ASCD), Scholastic Incorporated, and various other educational groups as well. The previous year, NISD sent several principals to the Model Schools Conference hosted by the International Center for Leadership in Education. The principal of Spotlight Middle School attended this conference as well. Because of the positive feedback from those who attended, NISD committed to host the conference as a means of providing meaningful professional development to more instructional leaders in the district. This was attempt to systematically improve instruction throughout the district.

***District Professional Development.*** Each year, in mid-August, the middle and high school Department Chairs and Team Leaders in Northwestern ISD participate in a professional development session. This workday is designed to assure alignment within the content areas across the district instructional leadership. For the 2009-2010 academic year, NISD launched a differentiated instruction initiative. The secondary curriculum department in NISD built a relationship with the National Association of Supervision and Curriculum Development to launch this initiative across all secondary (middle and high) schools within the school district. The goal was to improve instructional practices as a means of improving student achievement. Every core content (reading, math, language arts, science and social studies) Department Chair and Team Leader in the school district attended this professional development workday. Both of these professional development opportunities set the tone for targeting improved teaching strategies throughout NISD.

***Spotlight Middle School Professional Development.*** The first professional development day at Spotlight Middle School followed the professional development workday for the district.. All Department Chairs and Team leaders attended the workday. On this day, the Principal and Director of Instruction (the researcher for this problem of practice) of Spotlight Middle School met with the building Department Chairs and Team Leaders. During this meeting, achievement data were shared based on the newly released 2008-2009 TAKS test scores. Each Department Chair and Team Leader was given the opportunity to read the achievement data for their department, and then a discussion was held with the entire group. The official Texas Education Agency 2008-

2009 accountability rating for the Spotlight Middle School was recognized. For the 2008-2009 accountability year an additional accommodation was given to all schools, the Texas Projection Measure (TPM). TPM was a score predicting future TAKS success for individual students. All accountability ratings for the school fell in the exemplary range (>90%) except for the area of science (Table 4). The Hispanic sub-population scored within the recognized range of 83% passing and the African American sub-population scored 77%, in the academically acceptable range. The science department leaders seemed taken aback as they discussed their achievement data. The other instructional leaders seemed pleased with their scores; yet, all eyes were on the science department leaders.

**Table 4**

**Spotlight Middle School – All Grades  
TAKS Met Standard with TPM 2008-09**

<b>Subject</b>	<b>District</b>	<b>Campus</b>	<b>African American</b>	<b>Hispanic</b>	<b>European American</b>	<b>Asian</b>	<b>Economically Disadvantaged</b>
Reading/ELA	98	99	99	99	99	99	99
Math	92	97	93	96	97	97	92
Writing	97	97	98	97	97	99	90
Science	89	91	77	83	94	95	86
Social Studies	99	99	99	99	99	99	99

Source: TEA 2008-09 AEIS

At Spotlight Middle School there are four content leaders in each academic department, one at each grade level and one who leads the department as a whole. Although, it seemed, the four science leaders felt collectively responsible for the test scores, the eighth grade Team Leader and Department Chair said they took personal responsibility for the science TAKS test results. On this day the science leaders and building leaders began discussing and planning how to improve achievement for all science students. Keith Richard (the young man from the above scenario) was an eighth grader at Spotlight Middle School during the 2009-2010 school year. How would he, as well as his African American classmates, perform on the 2009-2010 Science TAKS test?

### **Summary**

This was a record of study using a problem of practice model. A qualitative research approach was utilized. Field notes from faculty and team meetings, as well as, responses from participant interviews was used to determine how teachers addressed the issue of closing the achievement gap between African American and European American students. Additionally, because of the researcher's role as an administrator (the Director of Instruction) at Spotlight Middle school and a participant in the day-to-day activities of the school, I extended the qualitative practice to include the unique opportunity to contribute to a transformative process of possible improvement measures. As a qualitative researcher, I acted as the "key instrument" for data collection (Creswell, 2007) p.38 This study implemented qualitative case study research as outlined in the study by Treagust, Jacobowitz, Gallagher, and Parker (2001). The case study approach was implemented with the 8<sup>th</sup> grade science teachers based on their instructional

practices for the 2009-2010 academic year. The teachers' perceptions of their own practices and instructional strategies were documented to examine levels of improved achievement for African American students. Test scores from African American students on the science TAKS test were compared from the 2008-2009 and 2009-2010 academic years to determine whether or not the achievement gap was narrowed in eighth grade science.

### **Definitions**

For the purposes of this study, the following definitions apply:

*Achievement Gap* – The disparity in achievement between African American and European American students

*Accountable Group* – The number of students who actually “count” towards a campus' AEIS data set to determine the current year's academic rating.

*AEIS* – Academic Excellence Indicator System: measures schools as academically unacceptable, academically acceptable, recognized, exemplary

*Culturally Relevant Teaching (CRT)* – a pedagogy designed to address academic achievement, while affirming the cultural identity of African American students

*European American* – term used to identify the continent of origin of White Larke, 2010)

*Problem of Practice* – A model allowing a researcher to study a current issue within the workplace and present a plan for improvement based on the results of the research.

*Quantum Learning (2008)* – “A powerful research-based educational system that orchestrates moves within the core components to achieve desired outcomes. The

Quantum Learning system has been proven to increase teacher effectiveness and improve student performance” (DePorter, Reardon, & Singer-Nourie, p. 1.5).

*Sub-populations* – specific demographic groups identified through the national and state accountability system (All, African American, Hispanic, White (European American), Asian and Economically Disadvantaged).

*Suburb(an)* – a residential area lying immediately outside a larger city or town

*TAKS* – Texas Assessment of Knowledge and Skills, test given in grades 3-11 to determine student achievement levels at individual campuses, districts and the state

*TEA* – Texas Education Agency: state organization responsible for the developing the curriculum and assessment standards for Texas.

*TPM* – Texas Projection Measure: indicator added in 2008-09 to predict the likelihood of a student’s success on TAKS in the future

### **Organization of the Study**

This study is divided into five chapters. Chapter I is an introduction the study. It provides a scenario of a hypothetical family affected by the achievement gap at Northwestern ISD, and an overview of the methodology including the research questions for the study. Key terms were also defined in Chapter I.

Chapter II provides a review of the literature regarding the achievement gap, culturally relevant pedagogy, middle schools research, instructional strategies and best practices for improving achievement in the areas of math and science.

Chapter III provides a description of the methodology used in the study, with brief descriptions of the participants. Chapter IV describes each participant in depth

along with a detailed analysis of their responses from meetings and interviews throughout the study year. Chapter V concludes the study with implications for future practice, research and systematic implementation.

## **CHAPTER II**

### **REVIEW OF RELATED LITERATURE**

#### **Introduction**

This chapter includes a review of the literature referenced throughout the process of my study. The reporting of this record of study used the problem of practice model. A qualitative research approach (Schwandt, 2007) was implemented to gain meaning and understanding to teacher behavior and practices employed to improve the achievement of African American students in eighth grade science classrooms. This study implemented qualitative case study research as outlined in the study by Treagust, Jacobowitz, Gallagher, and Parker (2001). A case study approach was implemented with the eighth grade science teachers based on their perceptions of their teaching practices for the 2009-2010 academic year. The practices and instructional strategies were documented to examine levels of improved achievement for African American students. A decrease in the achievement gap was measured based on a comparison of the 2008-2009 and 2009-2010 science TAKS scores.

#### **Conceptual Framework**

##### **The Achievement Gap**

On January 8, 2002 the Congress of the United States of America approved “The No Child Left Behind Act of 2001 to close the achievement gap with accountability, flexibility, and choice, so that no child is left behind” (Public Law 107-110, 107<sup>th</sup> Congress).



“The No Child Left Behind Act of 2001 requires schools to use scientifically-based research to improve student achievement” for all groups of students (Heller, Calderon, and Medrich, 2003, p. 3). When state standards are met for all students, gaps in achievement are reduced or closed. The enactment of federal guidelines under the No Child Left Behind Act of 2001, (NCLB) legislation during the Bush administration shined a bright light on the discrepancies in achievement between African American students and their European American counterparts.

The achievement gap is characterized by lower scores on standardized tests, lower academic grades, and higher rates of retention, drop-out and assignment to special education (Becker & Luthar, 2002). Additionally, Ford, Grantham, & Whiting (2008) cited the under-representation of African American students in gifted/talented and advanced placement programs as another characteristic of the achievement gap. In order to reduce or close the achievement gap between these groups of students, several proposals have been made, among them include improving teacher quality and preparation, raising teacher expectations for African American student success, and the development of a culturally relevant pedagogy to not only address academic achievement, but to affirm the cultural identity of African American students (Ladson-Billings, 1995).

According to Lewis, Hancock, James and Larke (2008) it is critical to examine national data in order to determine how well African American students have fared academically since the implementation of NCLB. In the study by Lewis, et al., (2008), African American students represented about 17 percent of the American school

population, but only three percent of the population of gifted and talented programs. Conversely, African American students represented 41 percent of the special education population (National Center for Education Statistics, as cited in Lewis, et al., 2008). Lewis, et al., (2008) found slight improvements in student achievement data from the National Assessment of Educational Progress (NAEP) in reading and math scores for grades four and eight for African American students. Since the passage of NCLB the academic achievement of African American students has improved slightly, but a huge gap still exists.

Despite the requirements to improve the achievement levels of all student groups, nationally, 89% of African American students still scored below proficiency levels in reading and 91% fall below proficiency in math prior to entering high school. Additionally, Kaufman, Kwon, Klein, and Chapman (as cited in Lee, 2002) reported the drop-out rate among African American students had been one and one half to two times higher than the European American dropout rate since the 1970s. All of these factors represented the enormous gap between African American and European American students.

Scholars have espoused many theories regarding how this gap can be closed over time. Lewis et al., (2008) discussed the importance of having a law mandating achievement, but contended there must be ways to enforce the law that will “increase the educational achievement of African American students” (p.18). Howard (2001) suggested teachers “modify their instruction to make it more congruent with the cultures and communication styles of culturally diverse students” (p. 183). Howard (2010)

additionally discussed the importance of discussions of race and class as important aspects of school reform in attempting to close the achievement gap. Mertens and Flowers (2003) emphasized the need for “diverse teaching and learning strategies to positively affect the achievement of each subgroup of students in schools” (p.34).

Gay (2000) made several assertions regarding improving achievement for students of color. Culture is an important factor in education. Pai, Spindler and Spindler, and Boykin, (as cited in Gay 2000) all agreed on the connection between culture and education. Teachers and students each have their own personal cultural backgrounds they carry into the classroom. These backgrounds lead each to construct their own meanings regarding individual and group behaviors, acceptance, rejection, conflict, accommodation, alienation and withdrawal. Without an understanding of one’s own cultural prejudices and preconceptions, student performance may be affected. Spindler et al., (as cited by Gay, 2000) concluded,

“teachers need to understand different cultural intersections and incompatibilities, minimize the tensions, and bridge the gaps between different cultural systems. Congruency between how the educational process is ordered and delivered and the cultural frames of reference of diverse students will improve school achievement for students of color” (p.12).

The second assertion regarding improving achievement by Gay (2000) discussed how conventional reforms and proposals were likely to fail due to the deficit paradigm from which they were created. Many of these programs focused on what “ethnically, racially and linguistically different students” (p.12) were lacking. They often separated

academic achievement from issues and factors (culture, ethnicity, personal experience) that contributed to success. Gay (2000) cited the Advancement Via Individual Determination (AVID) project as a successful program leading to academic achievement of African American and Latino students when interventions are provided and reinforced by a social support system.

Gay's (2000) third assertion related to those educators who had good intentions regarding treating all students the same, yet lacked the ability to put in place the changes in order to provide for a successful academic program for diverse students. Gay (2000) states, "good will must be accompanied by pedagogical knowledge and skills as well as the courage to dismantle the status quo" (p. 13).

Finally, Gay (2000) asserted, "cultural diversity is a strength – a persistent, vitalizing force in our personal and civic lives... and is a useful resource for improving educational effectiveness for all students" (p. 14). A student's background should be viewed as a resource to their educational process, not a hindrance. Students also learn from one another when the heritage and traditions of others are celebrated.

### **African American Achievement and the Receiving Gap**

According to Chambers (2009), scholars embarked to question the reasoning in using the term "achievement gap" to describe the disparity in achievement between African American and European American students. Ladson-Billings (2006) argued "the all-out focus on the 'achievement gap' moves us toward short-term solutions that are unlikely to address the long-term underlying problem" (p. 4). Chambers further submitted a focus on the inputs provided to children have a greater effect on their

achievement and better explain the outputs exemplified purely by test scores. Chambers (2009) proposed the term “reivement gap” (p. 417) to better explain the circumstances of African American achievement because it “focuses on structures, not students and inputs, not outputs” (p. 417) – what students receive on their educational journey, instead of their performance on a standardized test. This record of study centered on how the inputs – perceived instructional strategies of science teachers affect outputs – the scores of African American students on the 2010 Science TAKS test.

### **Middle Schools Research**

The National Middle Schools Association (NMSA) stated, “The purpose and functions of exemplary middle schools center on the intellectual, social, emotional, moral and physical development needs of young adolescents” (1995, p. 1). The middle school student is in transition between childhood and adolescence. Thornburg (as cited in Alexander and George, 1981) identified seven major characteristics of this middle school age group. Included in these characteristics were an awareness of increased physical changes, learning to organize knowledge and concepts into problem-solving strategies, an awareness of new social/sex roles, the ability to recognize one’s identification with stereotypes, developing friendships, independence, and a sense of morality and values.

The junior high school model that preceded the middle school reform movement largely overlooked the emotional and social difficulties typical of early adolescence. The Southern Regional Education Board (SREB) suggested the junior high model lacked a clear educational mission and primarily adopted the teaching models and discipline

structures of high schools (2010). “The main purpose of middle grades education is to promote young adolescents’ intellectual development” (Turning Points 2000 as cited in SREB, 2010, p. 3). The NMSA noted characteristics of exemplary middle schools to include interdisciplinary teams, advisory programs, and varied instructional practices, exploratory and transitional programs in order to positively foster the development of social skills, character and values among middle school students (Irvin, 1995, as cited in NMSA, 1995).

Educators in middle schools are challenged with the need to understand how curricular coordination and instructional practices are connected to student achievement (Mertens & Flowers, 2003). Mertens and Flowers (2003) stated, middle grade teachers “must understand there are differences in academic achievement among students of various backgrounds” (p.33) often requiring “diverse teaching and learning strategies to affect the achievement of the different subgroups” (p.33) in the school. Additionally,, Mertens, Flowers, and Mulhull (2003) found, “teachers with middle grade certification and who were members of an interdisciplinary team with high levels of common planning time reported the absolute highest levels of best team and classroom practices” (p. 56) in their report on lessons learned during the 30 year anniversary of the National Middle School Association.

Although many reformers in the middle school movement asserted the uniqueness of the needs of middle school, many of the recommendations for improvement in student achievement were similar to those for other levels, specifically high school. Those recommendations included creating smaller communities where

students felt connected to their learning as well as high quality staff development focused on student achievement (NMSA, 1995; NSDC, 1999, as cited in SREB, 2010). Furthermore, SREB (2010) highlighted several strategies for improved achievement in the middle grades: “curriculum, academic climate, engagement, parental involvement, school size and classroom structure, transition to high school, and teaching quality” (p. 4). Related to academic climate, the NMSA (1995; 2001, as cited in SREB, 2010 ) called for a “curriculum grounded in rigorous, public academic standards, relevant to the concerns of adolescents, and based on how students learn best” (p. 5). This idea of standards-based curriculum was found to have “small but positive effects on achievement and attitudes, especially for boys” among African American seventh and eighth graders in science (Kahle et al., 2000 as cited in SREB, 2010, p. 5).

Developmentally responsive middle schools were characterized by the NMSA (1998) to have educators who were committed to young adolescents, had a shared vision, an adult advocate for every student, high expectations for all students, a positive school climate, and family and community partnerships. The NMSA (1998) followed that developmentally responsive middle schools provide 1) curriculum that provides integration, exploration and challenge, 2) teaching and learning with varied approaches 3) flexibility with in the organizational structures 4) assessment and evaluation that promote student learning 5) program and policies that encourage health, wellness, and safety and 6) comprehensive guidance and support services (NMSA, 1998). According to the ASCD (2010), the ideal middle school should focus on and integrate several areas that include academic excellence, developmental responsiveness, and social equity. In

order to educate students in the middle grades, schools must focus on high expectations as well as understand how young adolescents learn. These findings were strongly linked to best practices for teaching science in the middle grades.

### **Middle Schools and Science Instructional Practices**

The National Academy of Science issued the final National Science Education Standards through its National Research Council (NRC) in 1995. These content standards incorporated eight categories of content: “science as inquiry, physical science, life science, earth and space science, science and technology, science in personal and social perspectives, history and nature of science, and unifying concepts and processes” (Lagowski, 1995, p. 287). These “content standards define what all students, regardless of gender, cultural, or ethnic background, physical or learning disability, or interest and motivation in science should understand and be able to do as a result of their school learning experiences” (Lagowski, 1995, p. 287). Along with the Content Standards, Lagowski (1995) further discussed the teaching standards that supported what science teachers needed to know and understand in order to teach; and assessment standards that recognize assessment as a formative teaching tool, not merely a summative assessment based on a student's ability to recall as a means to assign a grade.

Treagust, Jacobowitz, Gallagher and Parker (2001) conducted a research study in a middle school science class that showed the importance of embedding assessments throughout the teaching process in order to increase student achievement.

When learning is individualistic and dependent upon experience and motivation,



assessment must be continuous, sensitive to individual differences, and open-ended enough to be capable of reflecting deep and broad understanding.

Although some separate testing may be necessary, most assessment should be non-intrusive and integrated with learning activities (Kulm and Stuessy, 1991, as cited in Treagust, et al., 2001, p. 74).

However, what effect did standards-based instruction and embedded assessment have on the achievement of African American students in science?

Kahle, Meece, and Scantlebury (2000) noticed the earlier reforms in standards based science teaching projects and initiatives were mainly conducted outside of urban areas. Those projects, called Statewide Systemic Initiatives (SSI) focused on improving student achievement for all students by changing the practice of teachers. The Kahle, et al., (2000) study assessed “the efficacy of standards-based reform to improve (in terms of achievement) the science education of urban, African American, middle school, science students” (p. 1021). The results of the study showed standards-based teaching strategies were successful in improving the achievement of urban African American students in science. The results further indicated the importance of quality professional development for teachers of African American students in order to improve the teacher’s content knowledge and teaching practices.

Moreover, Kahle, et al., (2000) recommended policies at the national, state and local level to strengthen the requirements for on-going professional development for teachers of math and science for all students, regardless of their background. A study by Wenglinsky, (2000, as cited in SREB, 2010) noted a focus on higher-order thinking

skills and engagement in hands-on learning was important to student achievement among eighth grade students. Further, Marks (2000, as cited in SREB, 2010) noted that authentic instruction could strongly predict not only student engagement, but also student achievement in the middle grades. Furthermore, Kesidou and Roseman (2002) stated, “for learning to take place, curriculum material need to focus sound instructional strategies specifically on the ideas and skills that students are intended to learn” (p. 525). Teaching and learning must be purposeful in order to improve student achievement. The attitude of the teacher is paramount in this process.

### **Teacher Attitudes, Behavior and Actions as Related to African American Students**

In *Crossing Over to Canaan*, Ladson-Billings (2001) described academic achievement in terms of teacher attitudes toward the students in their classrooms. Academic achievement according to Ladson-Billings (2001), “is evident in classrooms where the teacher:

- “presumes that all students are capable of being educated.
- clearly delineates what achievement means in the context of his or her classroom.
- knows the content, the learner, and how teach content to the learner.
- supports a critical consciousness toward the curriculum.
- encourages academic achievement as a complex conception not amenable to a single, static measurement.” (p. 74)

These attributes are those proposed by the author to a group of novice teachers preparing to teach in a diverse classroom setting. Additionally, according to Ladson-Billings (2001), in classrooms focused on academic achievement, teachers were be

knowledgeable, set clear goals for student learning, devoted the majority of class time to learning, and capable of articulating individual student progress. Ladson-Billings (2001) further asserts new teachers must incorporate cultural competence into their practice in working successfully with diverse students.

Banks (as cited in Ladson-Billings, 2000) discussed the emerging literature due to the increasing diversity of school populations addressing “the needs of non-White students from the standpoint of language and culture” (p. 207). Additionally, Franklin and Moss (as cited in Ladson-Billings, 2000) discussed the unique experience of African Americans as a cultural group and the necessity for European American educators to acknowledge the systematic and consistent assertion of educational inferiority historically placed on African American students. Thus, Ladson-Billings suggested that different (culturally responsive) remedies must be used with African American students that recognize their cultural differences in order to improve their achievement. Further, the recognition of the cultural differences must be viewed as positive, and not from a deficit point of view.

Delpit (1988) discussed five aspects of the culture of power occurring in American schools.

1. Issues of power are enacted in classrooms.
2. There are codes or rules for participating in power: that is there is a “culture of power”.
3. The rules of the culture of power are a reflection of the rules of the culture of those who have power.

4. If you are not already a participant in the culture of power, being told explicitly the rules of that culture makes acquiring power easier.
5. Those with power are frequently least aware of – or at least willing to acknowledge – its existence. Those with less power are often most aware of its existence (p. 282)

Delpit (1988) explained power in terms of how the teacher interacted with students, curriculum and schooling standards that indicated what is normal for a learning environment. She further indicated the power relationships in classrooms were based on the culture of the upper and middle classes and teachers needed to explicitly teach students from outside of the upper and middle class the rules of learning within the culture of power in order for them to be successful. Delpit (1988) further explained many European educators often stated, “I want the same thing for everyone else’s children as I want for mine” (p.285) in a well intentioned manner without realizing how the culture of power affected the manner in which they taught the non-European students in their classrooms.

Howard (2007) referred to districts with rapidly growing populations of non-European students as “diversity enhanced school districts” (p. 1). He asserted teachers must view the increased diversity as an opportunity, not a problem in rapidly transitioning schools. He proposed five phases of growth, “building trust, engaging personal culture, confronting social dominance and social justice, transforming instructional practices and engaging the entire school community” (p. 2) as a means to alter the thinking and improve the achievement of students in diverse schools.

In order to change attitudes, the entire school community must work together to build trust while embarking upon serious issues like race and diversity. When all parties recognize the differences in cultures as assets and not deficits, Howard (2007) contends “the vigorous and ongoing process of self-examination and personal growth related to cultural competence” (p. 2) will take place. He continued by directing educators to confront the inequities in education by, “changing their own attitudes, beliefs, expectations, and practices” (p. 5). Finally, Howard (2007) suggested auditing and analyzing the curriculum and instructional practices as a means to become more responsive to the needs of a diverse student body.

### **Culturally Relevant Pedagogy**

Culturally relevant pedagogy is the theoretical model that addresses student achievement while helping students to accept and affirm their cultural identity, at the same time as critically thinking and challenging their situation in the academic and social world (Ladson-Billings, 1995). This theory builds on the term culturally responsive which was used by earlier scholars (Cazden & Legget; Erickson & Mohatt as cited in Ladson-Billings, 1995) to describe the use of similar language patterns between teachers and students who were linguistically diverse. The term provides a means for accepting and understanding the linguistic patterns and cultural backgrounds of people of color.

For over 25 years “anthropologists have examined ways that teaching can better match the home and community cultures of students of color who have previously not had academic success in schools” (p. 466). The terms culturally appropriate, Au and

Jordan (1981, as cited in Ladson-Billings, 1995); culturally congruent, Mohatt and Erickson (1981 as cited in Ladson-Billings, 1995); and culturally compatible, Jordan, (1985; Vogt, Jordan, & Tharp, 1987, as cited in Ladson-Billings, 1995) suggests the goal of education becomes how to ‘fit’ students constructed as ‘other’ by virtue of their race/ethnicity, language, or social class into a hierarchical structure that is defined as a *meritocracy*...reproduce(ing) current inequalities” (p. 467). Ladson-Billings (1995) further develops the framework by asserting “the term culturally responsive (as) a more dynamic or synergistic relationship between home/community culture and school culture” (p. 467). Ladson-Billings (1995) recognized the fact that “no matter how good a fit develops between home and school culture, students must achieve. No theory of pedagogy can escape this reality” (p.475). Therefore, each of the teachers studied by Ladson-Billings (1995) “felt that helping the students become academically successful was one of their primary responsibilities” (p. 475).

Gay (2000) described culturally responsive teachers as teachers who “validate, facilitate, liberate and empower ethnically diverse students by simultaneously cultivating their cultural integrity, individual abilities, and academic success” (p. 44). She further asserted that culturally responsive pedagogy is “anchored in teacher attitudes and expectations, cultural communication, and culturally congruent instructional strategies” (p.44). Teachers must have knowledge about the achievements and successes of various cultural groups, must not engage in blaming the victims (students) for previous academic failures and look for new solutions, have the will to confront deficit thinking and the skill and tenacity to be sensitive to cultural differences and construct activities that will

improve the performance of ethnically diverse students. Additionally, Gay (2000) asserted that “teacher expectations matter” (p.53) and teachers must care about whether or not students learn. In order to communicate effectively with ethnically diverse students in a culturally responsive classroom, Gay asserted that teachers “must learn how to communicate differently with them” (p.110). Fundamentally, Gay (2000) asserted the aim of culturally responsive pedagogy is to “empower ethnically diverse students through academic success, cultural affiliation and personal efficacy” (p.111). This will only take place through gaining knowledge in the content area studied. To achieve this, teacher must have the ability to make the curriculum content relevant to the learner.

Irvine (2001) outlined the critical elements of culturally responsive pedagogy:

1. Culture is a powerful variable that influences teaching and learning processes.
2. The effective teaching research is compatible with and supportive of the principles of culturally responsive pedagogy.
3. Teacher knowledge and reflection are important considerations when designing and implementing a culturally responsive lesson.
4. High standards and high expectations are important components of culturally responsive pedagogy (p. 6).

Irvine (2001) emphasized that culturally responsive pedagogy is complex and attempts to generate “tricks of the trade” (p.11) must be avoided due to complexities of the needs and motivations of diverse individual learners. Irvine further highlighted the importance

of teachers being reflective in their teaching practices with diverse learners in order to continually improve student achievement.

### **Quantum Learning (2008)**

In my research study, each participant (teacher) referenced a brain-based teaching program that was successful with not only their African American students, but with all of their eighth grade science students. They felt it provided an opportunity to honor their students' culture while incorporating brain-based learning strategies.

Quantum Learning (2008) a “program produced by Learning Forum, an international education company emphasizing the development of academic and personal skills” (DePorter, 1992 as cited in DePorter, Reardon & Singer-Nourie, 1999 p.4) was used during the study year. This brain-based teaching and learning system included specific guidelines for teachers to use in “creating an effective learning environment, designing curriculum, delivering content and facilitating the learning process” (DePorter, et al., 1999 p.4). This practice focused on implementing strategies that “remove the barriers to learning, thus returning the process of learning to its natural, ‘easy’ state” (p.6) for students, and reminded teachers of “the importance of entering the students world first in order to earn the right to teach (by) first building authentic bridges into students’ lives” (DePorter, et al., 1999. p. 6).

DePorter et al., (1999) explained the five tenets of the Quantum Teaching model: Everything Speaks - everything (i.e. classroom environment and body language) that happens in the classroom sends a message about learning; Everything is on Purpose - everything that occurs while the teacher is in charge has an intended purpose;



Experience Before Label - students learn best when they can experience learning prior to giving it a name or label; Acknowledge Every Effort - because learning is risky for many students it is important to recognize all efforts to participate; If It's Worth Learning, It's Worth Celebrating! - a celebration of effort provides students with feedback on their progress and allows students to know how much they have learned and how far they may have to go (DePorter, et al., 1999).

Additionally, the Quantum Learning (2008) teaching model emphasized the importance of context and content within a learning environment. The context focused on creating buy-in with students (enroll), by helping them to know why it was important for them to learn what was being taught. Next it created a common "experience" between the teacher and all the learners. The end celebration allowed the learners to acknowledge the attainment of the skills and knowledge acquired during the learning process. The content focused on the actual information students were expected to learn (label), opportunities for students to practice (demonstrate) and review to show the students actually knew what they had learned (DePorter, et al., 1999).

Gardner (1991, 2000) discussed the importance and use of multiple intelligences among different students as a way of presenting and accepting assignments based on the way individuals learn best. During the study year, Quantum Learning (2008) strategies supported the use of multiple intelligences for students to show their mastery of a topic or concept by presenting learning outcomes in varied forms that included spatial-visual, linguistic, interpersonal, musical-rhythmic, naturalist, bodily-kinesthetic, intrapersonal, and logical-mathematical.

Several references were made to the Quantum Learning model by the teachers in this study. Many of the practices mirrored the effective teaching practices of standards based and culturally relevant teaching. Because of the continued references to Quantum Learning strategies used by the teachers in this study, I felt compelled to add a description of the learning model to the review of literature.

### **Summary**

This chapter examined the related literature to the study process. The term achievement gap was defined within the context of the No Child Left Behind Act of 2001. Assertions by scholars were made regarding improving achievement for African American students (Gay, 2000), and providing solutions to the inputs provided to African American students (Chambers, 2009). Additionally, descriptions of the purpose and effective practices for middle school students (NMSA, 2000) and fostering a positive middle school climate with a standards-based curriculum (SREB, 2010) as well as a discussion of the importance of the incorporation of science standards and embedded assessments (Treagust, et al., 2001) was noted. Furthermore, teacher attitudes toward their African American were examined through a study by Ladson-Billings (2001) and connected to a discussion of culturally responsive pedagogy, Ladson-Billings (1995). Finally the program Quantum Teaching (Deporter, et al., 1999) was introduced as a method of respectful teaching that engages students in the learning process. Chapter III will detail the methodology used for the study.

## **CHAPTER III**

### **METHODOLOGY**

#### **Introduction**

This was a qualitative research project as described by Creswell (2007) designed to investigate the perceptions of the science teachers regarding the achievement gap that existed between African American and White students and the instructional strategies used by the teachers to close that gap. This record of study was a problem of practice that explored the ways in which Spotlight Middle School addressed narrowing the achievement gap in eighth grade science that existed between African American and White students. To accomplish this, a case study approach was implemented. Creswell (2007) described case study research as “a qualitative approach in which the investigator explores a bounded system (a case) or multiple bounded systems (cases) over time” (p. 73). In an instrumental case study, described by Stake (as cited in Creswell, 2007), the researcher “focuses on an issue or concern, then selects one bounded case to illustrate” the issue (p. 74). The bounded case in this instance was Spotlight Middle School’s eighth grade science teachers.

The following questions were examined during the research process in order to understand five teachers’ perceptions of the achievement gap and the instructional practices they employed to address this gap.

1. What were science teachers’ perceptions regarding the achievement gap that existed for African American students in science at Spotlight Middle School?

2. What instructional practices did science teachers perceive they used to improve achievement for African American students in science at Spotlight Middle School?

### **The Participants and the Setting**

Spotlight Middle School was a large, suburban middle school located in Southeast Texas. The student population for the study year was approximately 1700. Science was taught in each of the three grade levels (6, 7, and 8). This case study included only the eighth grade science teachers at Spotlight Middle School. All of the eighth grade science teachers were asked and agreed to participate in interviews. All participants were interviewed twice. The first interview took place prior to receiving the 2010 Texas Assessment of Knowledge and Skills (TAKS) results, and then the second interview occurred after the results were published. All interviews took place at the school, either in the office or in the teachers' classrooms.

There were five eighth grade science teachers; they all participated in the study (Table 5). One teacher served as the department chairperson, in addition to teaching, and another teacher worked as the eighth grade science team leader. Another teacher worked with students, in the classroom, as a special education co-teacher. Two teachers were male, the other three were female. Their years of experience ranged from two to twenty years.

Teacher #1- Ms. Michaels was a White female and had taught science for 16 years. She also served as the department chairperson and led the science department for three years. She had been at Spotlight since it opened in 2005. Teacher #2 - Mr. Kelley

was a White male and had taught science for 12 years. He had been at Spotlight since it opened in 2005. Teacher #3 - Mr. Ryan, a White male, had been teaching full time for two years. He began his career as a youth pastor for 18 years, and then began substitute teaching. He came to Spotlight two years prior to the study year and initially taught both math and science. During the study year he taught only eighth grade science. Teacher #4 - Ms. Nichols was a White female, special education co-teacher. She taught special education at a neighboring middle school prior to coming to Spotlight when it opened in 2005. Prior to teaching she was a special education paraprofessional. She became a special education teacher through an alternative education program. Teacher #5 - Ms. Kent, a White female, also served as the eighth grade science team leader. She taught science at two other middle schools for 14 years before coming to Spotlight in 2005.

**Table 5**  
**Participant Profiles**

<b>Name</b>	<b>Ethnicity</b>	<b>Gender</b>	<b>Number Years Teaching</b>	<b>Years at Spotlight MS</b>	<b>Certification Route</b>
Ms. Michaels	European American	Female	16	5	Traditional
Mr. Kelley	European American	Male	12	5	Traditional
Mr. Ryan	European American	Male	2	2	ACP*
Ms. Nichols	European American	Female	14	5	ACP
Ms. Kent	European American	Female	14	5	Traditional

\*Alternative Certification Program

### **The Role of the Researcher and Data Collection**

This was a qualitative research project. In addition to serving as the researcher, I was a member of the school faculty and had daily contact with the teachers. Because I was also a school administrator, special care was taken while soliciting the participation in the study in order to prevent any feeling of pressure on the teachers. The school principal consented to the research process and teachers were assured their participation was completely voluntary. The teachers consented to participate in the study as a means to inform their teaching practices and possibly improve the achievement of their students. The results from the study were shared with the subjects at the conclusion of the study process.

### **Data Sources and Context**

This qualitative research project was a case study. In qualitative research, data is collected in the natural setting and “aims at understanding the meaning of human activity” (Creswell, 2007, p. 248). Qualitative methodology often includes open ended, unstructured questions in order to gain meaning from participants. A case study is a means to generate knowledge of a particular phenomenon or situation (Schwandt, 2007). The case in this study was the group of science teachers at Spotlight Middle School during the 2009-2010 academic year.

The setting for this project was Spotlight Middle School. During the study year, I was the administrator responsible for curriculum and instruction at the school. I served as researcher and I was the primary instrument of data collection (Lincoln & Guba, 1985).

The science teachers were the primary sources of data. Additionally, achievement data was used to inform the interview process.

The study began by examining AEIS data from the Texas Education Agency from the 2007-2008 and 2008–2009 academic years. Data were reviewed for three academic years (including the 2009-2010) that indicated the presence of an achievement gap. The achievement data collected was from the public domain. TAKS data from the 2009-2010 school year were compared to the data from the 2008-09 school year to determine differences in scores.

### **Data Collection**

In this qualitative research project, case study research consisted of document analysis and interviews (Creswell, 2007; Lincoln & Guba, 1985; Merriam, 1988, 1998). As the researcher, I kept a journal of field notes to record historical data, process notes and interview responses. Additionally, interviews were digitally recorded, transcribed, and reviewed by the subjects. In addition to my personal notes from team meetings and data digs (meetings specifically designed to analyze student achievement data), the science department chairperson was asked to share notes and informal information from department and team meetings throughout the school year. This data allowed the researcher to investigate the extent to which professional development activities regarding improving student achievement and teaching strategies was discussed and considered for implementation within the department.

***Interview Process.*** Interviews took place during the second semester. Semi-structured interviews of teachers were conducted to understand the perceptions of the

science teachers at Spotlight Middle School. Interviews were digitally recorded and transcribed. The first set of interviews took place prior to the return of Grade 8 Science TAKS results. The teachers were asked specific questions about their perceptions and feelings regarding the achievement of African American students in science (see Appendix B). During the interviews, the department chair and teachers were asked about their perceptions about how well students were prepared and the role they played in the student learning process prior to taking the TAKS test and just after receiving the results from the test. Additionally, during the interview process, teachers were asked to discuss their teaching strategies and practices designed to enhance and improve student achievement, particularly with African American students (see Appendix B). The second set of interviews took place at the end of the school year in early June, after the results were returned. Questions from the second interview were developed based on the triangulation of data from previous interviews and historical data analysis (see Appendix C). All interviews took place in classrooms or administrative offices and lasted approximately 20-30 minutes each. After the completion of both sets of interviews, the digital recordings were transcribed and placed in written format for review by participants and later analysis.

### **Data Analysis**

Analysis of all collected data consisted of reviewing all historical documents and interviews to develop patterns and themes. Student achievement data and historical records were examined and analyzed to make comparisons to establish differences and/or changes between the two years of test data (2008-2009 and 2009-2010). A



qualitative research strategy was used to analyze data through extensive review of field notes from document analysis and interviews (Boyatzis, 1998, Creswell, 2007).

Member checking is a method to solicit feedback from participants regarding the investigator's findings (Schwandt, 2007). After interviews were transcribed, the written transcription was shared with the participants to verify the accuracy of the printed responses. All participants took part in the member checking process. After a few amendments, all participants verified the accuracy of the printed transcripts.

In order to analyze data from the participant interviews, a constant comparative method of coding (Glaser & Strauss, 1967) was employed to continually compare segments of data within and across categories until definite categories emerged from the interviews. This data-driven approach (Schwandt, 2007) was used to develop themes from coding samples of interview data. After the themes were created they were then applied to the remaining data to establish the validity of the themes so that interpretation of the results was possible.

Peer debriefing is described as the process by which a researcher confides with a trusted and knowledgeable colleague to review and comment during various parts of the research process (Schwandt, 2007). During the data analysis process, I met on several occasions with another doctoral candidate researching a similar topic to share ideas, review data and themes, and act as a general sounding board throughout the data analysis process. This peer debriefing process assisted in validating the coding and theming process as well as provided general support in the completion of the research process.

***Trustworthiness.*** Throughout the research process, trustworthiness was established by prolonged engagement and persistent observation in the field (Lincoln & Guba, 1985; Merriam, 1998), interviewing participants and all aspects of the case study. Additionally, member checking occurred to validate the participants' view of the credibility of the findings from the interview data and transcription (Lincoln & Guba, 1985; Merriam, 1998; Miles & Huberman, 1994). Trustworthiness was facilitated through the triangulation of data and from using "thick description" from interview data that allows readers to make decisions regarding transferability (Lincoln & Guba, 1985; Merriam, 1998). The results of the research findings were shared with the teacher participants, as well as with the school leadership, at the end of the study in order to possibly inform future teaching practices. Thus, this study was part of a collaborative project where the researcher and participants worked together, and after reviewing the data, worked to seek improvement of student achievement.

During the study year I acted as an insider and outsider (Merriam, Johnson-Bailey, Lee, Kee, Ntseane, & Muhamad, 2001) and played an important role throughout the study process. As a member of the faculty, I was an insider because of the high level of interest and commitment in improving student performance. Additionally, I was possibly viewed as an outsider, by the participants, because of my role of campus administrator. Teachers often feel separated from administration due to the evaluative role of the administrator. Because I was one of the building administrators, there was access to achievement data; however, teachers had to consent to participate in the interviews in order to share their perceptions about their teaching strategies. As the

researcher, I could only discover information by gaining the trust of the teachers over time. Throughout the study process, I had to carefully navigate my position as researcher and administrator. Furthermore, although I did not directly supervise the science department, I did serve as an administrator, and therefore an indirect supervisor. Because of this, issues of power may have emerged. However, as related to power, Merriam and Simpson (2000, as cited in Merriam, et al., 2001) explained the importance of power awareness as well as negotiating power during the research process. As the researcher, I took great care to inform the teachers of their voluntary participation. All teachers were aware of their ability to remove themselves from the study at any time. Additionally, the principal served as the gatekeeper for participants in case any of them felt pressured during the research process.

Although the findings will serve to add to the body of research, the researcher was particularly interested in how the findings and recommendations would inform the continued practice as a building administrator at this school and others. A possible limitation, according to Merriam et al., (2001) could occur due to the researcher beginning data collection with particular assumptions about the phenomenon being investigated, the situations observed, and people interviewed. As an African American female, who studied the behaviors of White teachers of African American students and a building administrator, participants may have felt uncomfortable when asked and answering questions about their teaching practices with African American students. As the researcher, I attempted to take great care to make the participants feel comfortable and express any discomfort, if it existed. This was accomplished by consistently asking

general questions and then later asking the teachers to give more specific information as it related to African American students.

### **Ethics**

This study met the standards of the Human Subjects Protection Program and qualified as “exempt” under the Institutional Review Board provisions of the Office of Research Compliance at Texas A&M University (see Appendix 6).

There are national standards that address ethics for school leaders. The Interstate School Leaders Licensure Consortium (ISLLC) addressed the area of ethics in the area of decision-making, administrative practices, confidentiality and integrity (Owens & Valesky, 2007). The Texas Administrative Code of the Texas Education Agency (1998) gave a clear outline the ethics of educators. As an educator, I was bound by those rules and followed them throughout the study period.

Although the middle school studied was an actual campus, pseudonyms were used for the school and district. The principal was referred to by title and teachers were assigned numbers (Teacher #1, Teacher #2, etc.) and pseudonyms. My role as the researcher was important to this study as I was an administrator at the school. The problem is a real one concerning all those involved. Throughout the year I participated in achievement planning as a part of my professional responsibilities to the school. The results and recommendations from this study will affect my professional work well after the completion of the project.

**Summary**

“Qualitative inquiry aims at understanding the meaning of human action” (Schwandt, 2007, p. 248). Additionally, Schwandt (2007) described gathering qualitative data through non-quantitative methods such as semi-structured interviews. This chapter described the research design and methods used to explore the perceptions of five eighth grade science teachers regarding the achievement gap that existed at Spotlight Middle School for African American students. The case study was outlined and included a discussion of the method for data analysis and establishing trustworthiness. The findings of the research project will be outlined in Chapter IV.

## **CHAPTER IV**

### **FINDINGS**

#### **Introduction**

The purpose of this study was to investigate the perceptions of five science teachers at a suburban middle school regarding the achievement gap between eighth grade African American and European Americans students. This problem of practice explored the perceptions of the teachers as well as the strategies they used to address narrowing the gap. This section includes the reporting of the findings of the study. It begins with an overview of the problem of practice that existed at the study campus, Spotlight Middle School. A profile of each participant follows, and then a reporting of the findings of each research question as interpreted from field notes throughout the study year and participant interviews. Several themes emerged from the data gathered in team meetings and during the interview process: 1) Perception of treating all students the same regardless of race/ethnicity 2) Teamwork among teachers 3) Use of Quantum Learning (2008) strategies, and 4) Building relationships with African American students. Sub- themes also emerged including acknowledging the existence of an achievement gap, building science vocabulary for students, and teachers taking ownership of student achievement as well.

#### **Spotlight Middle School**

Spotlight Middle School is a large suburban middle school in Southeast Texas. The student population during the study year was 70% European American, 15 % Hispanic, and 9% African American (TEA, 2009). The inaugural year (2005-2006) did

not count as an accountability year for Spotlight Middle School. In the 2006-2007 year the school earned the TEA rating of academically acceptable. During my first year (2007-2008) as the administrator responsible for curriculum and instruction, the school earned the TEA rating of recognized. During that year (2007-2008), all accountable testing sub-pops scored at the 80% or greater range for all TAKS tests. When I was hired the principal explained to me he wanted the campus to gain the exemplary rating and he was looking for ways to improve the achievement of all the students, including the African American students. At that time, I was ready for the challenge, but I was unaware of the achievement gap that existed between African American students and European students, particularly in the areas of math and science.

At the beginning of this project, as the researcher, I was curious about what types of strategies and thinking processes might help to close the achievement gap that existed between African American and European Americans students at Spotlight Middle School, a predominantly European Americans, and suburban campus. As a female, African American researcher and educator, I wondered if there may be some underlying reasons why African American students were doing so poorly as compared to their European Americans counterparts. At the time of the study, African American students comprised only nine percent of the population of students and teachers. The achievement gap between African American and European Americans students had existed in math and science since the school opened in 2005. Were teachers ignoring them? Were teachers being insensitive to their unique needs as African American students? Did teachers have low expectations?

The results from this study, however, show that after one year of focusing on improving student achievement in science, for all students and highlighting the needs and expectations of African American students in particular, better results in science and a significant reduction in the achievement gap between European Americans students and African American students occurred. In the 2008-2009 academic year African American students passed the science TAKS test at a rate of 77%, academically acceptable by TEA standards compared to 94 % for European Americans students. In the 2009-2010 academic year, African American students passed the science TAKS test at a rate of 90%, 13 points higher than the previous year and exemplary by TEA standards, compared to 99% for European Americans students. The story behind this dynamic outcome follows.

#### **2009-2010 Academic Year**

When this project began the researcher worked as the instructional administrator at Spotlight Middle School, directly under the leadership of the building principal. At the beginning of the 2009-2010 academic year, more specifically the summer period prior to school beginning, the instructional leadership team at Spotlight Middle School spent time reviewing their test results from the 2008-2009 academic year. The instructional leadership team included the Principal, Director of Instruction (myself), Lead Counselor, Department Chairs and Team Leaders. The instructional leadership team met monthly to collaborate on curricular issues that affected the school. The science Department Chair and Team Leader were on the instructional leadership team, and were two of the participants during the study year.



### **TEA Rating for Spotlight Middle School**

For the 2008-2009 academic year, all TAKS scores for all sub-populations were rated within the TEA exemplary range (90% or above passing) with the exception of the science scores. The Hispanic sub-population scored at the 83% passing level. Because the Hispanic subpopulation did not score at the exemplary level (at least 90 % passing) the campus received the TEA rating of recognized. Earning a recognized rating was disappointing to the campus, because throughout the year, the entire campus was focused on earning the exemplary rating. More disappointing, however, was the fact that the African American subpopulation of students, who took the science test, scored at a rate of 77%.

TEA stipulates that the campus rating will be based on the rating of all of the accountable subpopulations that exist at a school. During the 2008-2009 academic year, there were not enough African American students enrolled in the eighth grade to meet the size limit for accountability. There must be at least 50 students within the tested subpopulation or the tested subpopulation must be at least 10 percent of the total population of the entire testing group. In this case, neither eighth grade science nor eighth grade social studies were accountable for the African American subpopulation at Spotlight Middle School. There were only 35 African American students in the eighth grade out of a total of 527 eighth graders, therefore the group only represented six percent of the eighth grade tested population. If the African American subpopulation had met the size standard, Spotlight Middle School would have received a rating of Academically Acceptable for the 2008-2009 academic year.

### **Planning for the 2009-2010 Academic Year**

The instructional leadership team, particularly the science department chair and eighth grade science team leader, decided there would have to be purposeful planning for the 2009-2010 academic year in order to increase the opportunities for success for all of the students at Spotlight Middle School, but in particular for those African American eighth grade students, who would represent 11% of the tested population for science. It was clear that African American students would meet the TEA standard for counting as a sub-population in the 2009-2010 testing accountability system.

### **First Instructional Team Meeting – August 2009**

At the very first meeting with the instructional leadership team during the summer in 2009 when the principal shared the scores he said, “Guys, I don’t have to tell you, if that sub-pop (African Americans) had counted we would not even be recognized now”. The science leaders looked somber and then began to discuss how they were going to improve the scores of “that sub-pop”. I heard them say, “What can we do? Do you think it is vocabulary? Do we need to break them up in to smaller groups?”

Both the principal and I reiterated to the teachers the importance of knowing who their students were and knowing what type of help the students needed based on the TAKS tested objectives. As a group we talked about spending time over the next year looking at the student SFA (benchmark) data by sub-population and targeting those sub-population that performed at a rate below 80%. This was for the purpose of re-teaching. Additionally the group talked about changing their teaching strategies and styles to accommodate the learning styles of their African American and Hispanic students.

Before reporting the findings, I would like to give an overview of my position as the researcher, a description of the school as it relates to the TEA rating, and profiles of the participants.

### **Focus for 2009-2010 Academic Year**

The beginning of the 2009-2010 academic year brought a renewed focus for the science department at Spotlight Middle School. The eighth grade teachers knew their students, both Hispanic and African American, needed to improve their performance if Spotlight was going to become a Texas Education Agency exemplary campus. The goal for the campus was to earn the exemplary rating. The science department knew if their scores did not improve, the campus would not receive the higher rating. As the administrator responsible for curriculum and instruction at Spotlight Middle School, I had a keen awareness of the difficult task ahead of the eighth grade teachers.

### **A Plan to Improve Instruction**

The entire 2009-2010 academic year, the campus was devoted to improving instruction in order to earn the exemplary rating. Along with the principal, department chair, and eighth grade science team leader, I participated in purposeful planning for the academic year to better position the campus to gain the exemplary rating. Every faculty meeting and staff development session highlighted teaching in quadrant D of the Rigor/Relevance framework (International Center for Leadership in Education, Inc., 2009) and Quantum Learning (2008) strategies. Additionally, science department and team meetings focused on planning in a way that ensured all teachers on the team were using the same materials for first time teaching and reviews. Every six weeks the

principal and I participated in data digs with each department, including the science department to analyze their SFA (benchmark) data. These discussions included the achievement of students by sub-population, and plans for re-teaching concepts missed during the benchmark. Although there was a campus wide focus to earn exemplary in all tested subject areas, this research highlights how the campus addressed increasing the scores in eighth grade science for the African American students.

Planning for the 2009-2010 academic year started with the plans for staff development. Because the overall focus of the campus was to become exemplary by TEA standards, the campus set its goal to improve the commended levels of all students in all tested areas. In order to meet this goal the campus staff development plan required the teachers to participate in a minimum of 14 hours of professional development. As the administrator for curriculum and instruction, along with the building principal, I provided teachers the opportunity to choose between two paths for professional development. Teachers were asked to participate in sessions related to teaching gifted and talented students or on Quantum Learning strategies. The principal and I felt both types of training sessions would allow teachers to focus on teaching strategies that facilitate higher levels of thinking for students. The 2009-2010 academic year was the second year with this particular staff development focus.

During the 2009-2010 academic year the campus increased its focus on Quantum Learning (2008) strategies by incorporating an additional training session for teachers to use in order to create an optimal learning environment in their classrooms, purchasing posters and lamps, and incorporating a Quantum Learning (2008) focus at each staff

meeting. The principal incorporated the Quantum Learning (2008) focus as a way to model brain-based instruction during staff meetings that could also be used in the classroom.

Although the science department had incorporated some Quantum Learning strategies during the previous year, they had not fully embraced the concepts. Some teachers adjusted the lighting in their rooms, some of them used the hand claps as opening traditions (DePorter, et al., 1999), but in general, the department did not, as a group, implement the major tenets of Quantum Learning (2008). After learning about the 77 % pass rate of the African American student subpopulation from the 2008-2009 academic year, the science department decided to use more of the strategies in order to improve their student results. When the results of the 2009-2010 TAKS results were finally tabulated, Spotlight Middle School had earned the Texas Education Agency rating of Exemplary. All students groups (with TPM calculated in three areas) passed all areas of the TAKS test at a rate of 90% or greater. More importantly to this study, 90% of the African American subpopulation met the passing standard for eighth grade science, without using TPM! This was a 13 point increase over the 2008-2009 academic year. While a gap of nine points still existed between the African American and European Americans students, the gap represents a difference between the low and high ranges of exemplary.

What follows are the profiles of the teachers studied, the information they shared about their perceptions of the achievement gap and the teaching strategies they used to help close that gap. Two interviews took place. The first interview occurred shortly after

the Science TAKS test was administered. Additional information is included from faculty and team meetings that took place throughout the year. The interview process was purposeful. As the researcher and administrator, I worked with the teams throughout the year. I held off on interviewing them until after the TAKS testing process because it was important for them to concentrate on their work and not what they perceived I wanted to hear. I wanted them to concentrate on improving student achievement, and then tell me what they did after the test occurred. The second set of interviews took place just after the results were posted. This provided an opportunity for the teachers to analyze their individual and collective data, and then think about the activities or strategies they perceived contributed to their test scores.

### **Participant Profiles**

#### **Teacher #1 – Ms. Michaels**

Ms. Michaels is a female, European American, 16 year veteran teacher and has taught at Spotlight Middle School for four years. For the last three years she has served as the department chairperson at Spotlight Middle School. Ms. Michaels explained that she became a teacher because when she was growing up school was a safe and fun place for her. Although she did not go into specifics, she stated that her home life was sometimes scary and unstable, but school was “...consistent, fun, entertaining....athletics was great, cheerleading was great, all the extracurricular activities so, I was just...I (knew) I would just grow up to be a teacher”.

She worked at another school in the district and when Spotlight Middle School opened, she was able to interview and transfer to Spotlight Middle School, allowing her to work

closer to home. She also knew the principal because she taught his child at her previous campus. When asked about how she feels about leading the science teachers at Spotlight Middle School she replied, “Humbled, everyone is usually very professional, tries really hard, works really hard, really cares about the kids...there’s passion, and I feel humbled to get to have that opportunity”.

In addition to leading the department of sixth through eighth grade science teachers, Ms. Michaels also teaches eighth grade science. Since eighth grade science is a TAKS tested subject she is responsible to not only teach the curriculum, but also to monitor the alignment of the other teachers as well. While discussing her role as a teacher-leader for the academic year she indicated, “I felt like this year my responsibility was to make sure that we were more consistent across the board in each team about how we’re teaching things and presenting things and approaching things”.

Throughout the study year, Ms. Michaels seemed very concerned about her role as a teacher-leader and how her expectations of her colleagues were also mirrored in the expectations she held for herself in the classroom. She commented regarding this,

“I absolutely try everyday. And it’s funny when I go into another classroom and I see someone maybe word it a little bit differently and I’m like, aw, I should have put it that way. You know, sometimes you get the best ideas from dealing with teachers. We definitely beg, borrow off of each other and learn from each other. I hope to always present that, and then I also learn off of other colleague’s presentations as well”.

When asked about specific goals for teaching science to African American students, Ms. Michaels discussed the goals for all students in all of the subpopulations,

“... just in general, all the sub pops ...reaching a certain level of passing rate, not only on TAKS, but in their classrooms. Just like – I know TAKS is really, really important – but also the everyday classes – just in passing their unit test, just them passing their projects – just their – getting their homework in, getting their daily grades up , and things of that nature. All of it across the board”.

She noted that her African American students seemed to be more kinesthetic than visual or auditory and she tried to focus more on those techniques with students during the study year. Her focus was on teaching all her students effectively, but she was able to point out the kinesthetic abilities of the African American students, “...they (African American students) have a tendency to be more kinesthetic than maybe other sub pops”.

She also talked about the importance of building relationships with all of her students, including the African American students, “I’d rather build that relationship one on one with that specific kid because I worry ...that sometimes even with the group dynamic, even if it is a small group, I’m still I’m not getting through completely to them”.

In general, Ms. Michaels indicated she had the same goals and expectations for all of her students, but, when prompted she spoke specifically about her goals for the African American students she taught.



**Teacher #2 – Mr. Kelley**

Mr. Kelley is a male, European American, 13 year veteran teacher and has taught at Spotlight Middle School for four years. When asked why he became a teacher Mr. Kelley discussed teaching as a natural transition for him. As a teenager Mr. Kelley worked with kids in summer and day camps. He wanted a change after eight years of teaching at another school within the district, so interviewed and was hired to teach science at Spotlight Middle School. When asked about how he worked with the other science teachers at Spotlight Middle School, Mr. Kelley emphasized he felt part of the team. He planned lessons with the other team members and felt that they were all on the same page as far as teaching the content and the strategies they all used, “I feel like I’m more a part of the team than I was in the past...(during) planning and having more to say”.

During the first interview with Mr. Kelley, he seemed very clear that a gap existed between African American students and European Americans students in science, he explained his goal was “to try and close the gap as much a possible between the different sub-populations while not letting the (general) population drop”. More specifically he reiterated that the general population needed to increase or remain the same while “closing the gap” between the African American students and other students.

When asked about how he worked with African American students in particular, Mr. Kelley emphasized that he used the same strategies with all his students, he “didn’t

target, specifically, African Americans”. For all his students he emphasized he used the same strategies and had the “same goal for all kids”.

### **Teacher #3 – Mr. Ryan**

Mr. Ryan is a male, European American, two year, alternatively certified teacher. Although he spent some time substitute teaching, Spotlight Middle School was his first full time teaching position. Prior to becoming a science teacher at Spotlight Middle School, Mr. Ryan worked for 18 years as a youth pastor. He indicated he always enjoyed working with students, particularly middle school students. After substitute teaching on and off over the years he decided to apply to teach full time. During his first year at Spotlight Middle School he taught both math and science. In his second year at Spotlight Middle School he taught all eighth grade science classes. He stated as his goal “...to help students realize that no matter what they think they want to do, somewhere in their life, science is going to be involved in (their) career...the rest of their life....everywhere you turn is science”.

During our interviews, Mr. Ryan did not speak specifically about an achievement gap or how he was addressing the gap in his classes. Instead he talked about how he treated all his students the same, based on their performance.

“I don’t know that I really target any ethnic group, especially in our atmosphere. Really, targeting happens in the third, fourth week, whoever is not turning in their homework and whoever is achieving lowly on daily grades or test grades. I think that our African American population, at least in my class(es) we’ve got

both ends of the spectrum of perfect straight A students and the one you just want to go “wake up, you’re throwing your life away”.

He referred to his African American students as the “African American students I got to teach”, indicating, to me, he felt good about teaching those students. When asked about using specific strategies with the African American students he indicated he didn’t do anything differently than what he did with other students, “pretty much treat them all the same”.

#### **Teacher #4 – Ms. Nichols**

Ms. Nichols is a female, European American, special education co-teacher. She has been teaching for a total of 18 years, the last five years have been spent at Spotlight Middle School. She began her career in education as a special education paraprofessional. She enjoyed the work so she decided to complete an alternative certification program (ACP) to become a teacher. She transferred to Spotlight Middle School after teaching for 14 years at another middle school, mainly to work closer to home. When referring to her time at Spotlight she explained, “now you are stuck with me”.

In NISD, special education teachers work collaboratively with the general education content teacher. During the 2009-2010 academic year, Ms. Nichols worked with both seventh and eighth grade science classes as the co-teacher. She planned with each grade-level team and worked in the classrooms where various special education students were assigned. She often taught lessons alongside the general education science teacher, and additionally spent time accommodating and modifying the

curriculum for those students assigned to her. When asked about her goal for students in science for the 2009-10 academic year she stated, “to have all of our special ed kids passing”. Ms. Nichols seemed very concerned about all of her students passing, in fact, when asked if she had a specific goal for her African American students who were also in special education she stated, “Not specifically....sometimes I use different teaching styles maybe with different sub-pops...I guess I look at each kid individually because they all learn so much differently”.

She discussed using teaching strategies to get her students more involved and even mentioned the word gap, but did not focus on the students based on their ethnicity as much as on their individual needs.

#### **Teacher #5 – Ms. Kent**

Ms. Kent is a female, European American, 20 year veteran teacher. She has taught eighth grade science at Spotlight Middle School for the past five years. She discussed becoming a teacher because she always loved working with kids. She felt kids loved her as well and she had experience with children through babysitting and working at a dance school as an older teenager. In her interview she talked about how she ended up at Spillane. For several years she worked at another middle school within the district, and then was recruited to teach at a different middle school whose population had increased. The following year, the boundaries changed and her position was eliminated. This happened the same time Spotlight Middle School opened. She interviewed and was successful in getting a science position. Ms. Kent has acted in the role of eighth grade science team leader for the past two years. As team leader she was responsible for

guiding the lesson planning process and ensuring the correct scope and sequencing of the curriculum taught. When asked about the goals she had for her science students she said, “I would love to have 100 percent of my kids pass...I want my commended numbers high...and I told the kids, I don’t see any reason why you would not pass this test”.

She was very focused on students being engaged. She mentioned particularly the African American students not being as engaged as some other students in class, “I find that I have to go to them and talk to them to see what they really know”. She further stated about her concern for her African American students, “I don’t know if I noticed that about that particular group or if it’s because I’m just worried about that sub-population (passing)”.

In general, Ms. Kent wanted all her students to pass the TAKS test and felt she needed to try other methods and strategies to help her African American students find success.

The major themes are outlined below. The sub-themes are included within some of the major themes, but in many cases overlap within the discussion of the major themes.

### **Research Questions**

What were science teachers’ perceptions regarding the achievement gap that existed for African American students in science at Spotlight Middle School?

What instructional practices did science teachers perceive they used to improve achievement for African American students in science at Spotlight Middle School?

### **Perception of Treating all Students the Same Regardless of Race/Ethnicity**

Throughout the interview process a strong theme emerged concerning treating all students the same with the strategies used in the classroom. While it is true the scores of all students increased during the study year, European American student scores increased by six percent and Hispanic student scores increased by five percent, it is significant that the scores of the African American students increased by 13 points. Some of the teachers admitted to using specific strategies with their African American students; but most teachers were resolute about using the same strategies with all their students.

As it relates to the achievement gap with African American students Ms. Michaels often grouped the discussion of African American students into a conversation that included all of the subpopulations. She mentioned that to reduce the achievement gap at Spotlight Middle School "...in general, all the sub pops ...reaching a certain level of passing rate".

She did mention she thought the group of African American students were more "...kinesthetic than anything else, and then auditory after that...just that particular group of kids..." speaking of her current African American student population.

During his first interview Mr. Ryan was very clear that he did not target any group of students based on their ethnicity. He targets them based on their performance in his class according to their performance on their daily and test grades. He said, "Our students come from so many diverse backgrounds. Really, targeting happens in the third,

fourth week, whoever is not turning in their homework and whoever is achieving lowly on daily grades or test grades...we pull in”.

Mr. Ryan felt strongly about expectations from home playing a factor in motivating the African American students to do well in his science class. When asked specifically about the African American students, he reiterated the importance of “...treat(ing) every kid like they have the potential to be anything they want to be, no matter their background or their home life...to encourage them to take charge of their life and their education”.

Even in his second interview, Mr. Ryan continued to emphasize the importance of treating each student the same; his main point was to show all students your concern for their learning.

Mr. Kelley was the only teacher who specifically addressed the achievement gap during his interview. He said his goal and the goal for the department was “...to try and close the gap as much a possible between the different sub-populations while not letting the (general) population drop...the key this is that to keep the general population up but also closing (the gap)”.

When asked about his goal for African American students he was clear that he had the same goal for all his students, but he wanted the African American students “...to perform as well as all the other students...to pass TAKS and do well in class”.

He spoke about how after the first couple of weeks of the semester he targets those students who haven't done well to keep them on task. He did this with all his students, regardless of ethnicity. After the results were returned and Mr. Kelley was

asked about what he did specifically with African American students, he reiterated that African American students were not specifically targeted, but he tried different teaching strategies this year with any student who was struggling.

Ms. Kent wanted her African American students to “...accept school and to accept the challenge to score commended on their science TAKS test”.

She said about her African American students, “That was my big goal was to get a hundred percent (passing)”, not just her African American Students, but all of her students.

During his initial interview, Mr. Kelley focused on two strategies he used in his classes in order to improve the achievement of his science students. He was insistent that the strategies were not just for the African American students, but to improve the achievement of all of his students, “(My) specific goal, I’d say the same goal for all kids. I want them to perform as all the other students”.

After the scores were returned Mr. Kelley said he was “pretty happy” with the results. When asked again about the specific strategies used this year to improve the achievement of the African American students he replied,

“I think with a lot of my students – I didn’t target, specifically, African American, but we did a lot more of vocabulary-based and more brain-based, also with the Quantum Learning stuff thrown in so that the two of those strategies were the new things we tried this year”.



He also said he would like to continue to emphasize the vocabulary building, “I think in science that’s where the weakness is. They don’t understand the words so they get confused reading the questions”.

Ms. Nichols was a special education co-teacher during the study year. She worked directly with the other four teachers to specifically meet the educational needs of students receiving special education services. Like the other teachers, she indicated her teaching strategies were the same for all students, but when asked about the special education students she served who were African American she said, “I guess doing what I do...I use different teaching styles maybe with different sub-pops. I guess I look at each kid individually because they all learn so much differently, looking at specifically what each kid needs”.

Although she initially felt she didn’t do anything differently for African American students as a group, she qualified her statement to reflect her attempt to meet the different needs of each of her students.

### **Acknowledgement of the Achievement Gap**

From the start of the year the teachers were aware of the gap in achievement that existed between the African American and European American students.

Mr. Kelley was clearly aware an achievement gap existed and wanted to close it. He changed the manner in which he taught all his students in order to close the gap.

Ms. Nichols, special education co-teacher for science responded when asked about her perceptions regarding the achievement gap, which she acknowledged the

existence of the achievement gap between the African American students and the other students, but her focus was more on the special education students assigned to her.

During her first interview, Ms. Kent talked a lot about how she felt the TAKS test was a basic skills test that everyone really had the capacity to pass. As the eighth grade team leader she was aware of the achievement gap between African American students and European Americans students. She said that as far as having a specific goal for African American students, "...that was in the back of my mind because of our scores (and) because of how that sub pop is pulled". She knew the scores of the African American students would have to be a lot higher in order for the overall science rating to improve.

Mr. Ryan spoke about the diversity of the African American students in his classes, "...we've got both ends of the spectrum of perfect straight A students and the one you just want to go 'wake up, you're throwing your life away'". He also talked about his experience with a group of African American students from last year and how they had high expectations from home, so they always did their work and studied. "I think (they had) motivation from home and self-motivation". He did not speak specifically about the achievement gap for the students he taught because they did well on last year's TAKS test, apparently part of the 77% who passed.

### **Teamwork Among Teachers**

The issue of having the members of the team work closely together throughout the academic year resonated during the interview process and was evident during team meetings and in the classrooms. During the year, I noticed each teacher had similar wall

posters and anchor charts hanging in their classrooms. The teachers all used the same activity books for warm ups and discussions about strategies were always active during the team and data dig meetings.

During her initial interview Ms. Michaels was very talkative. She shared a lot of information about her team and how they worked. She was careful to speak positively about the team and talked a lot about how she wanted them to feel comfortable with her leadership. When discussing her goal for the science department she felt it was her responsibility to bring the team together and to keep the team on the same page. She stated, “I felt like this year my responsibility was to make sure that we were more consistent across the board in each team about how we’re teaching things and presenting things and approaching things”.

She talked about how she spent time participating with all the grade level teams to learn if they were on the same page and being consistent. By her second interview, Ms. Michaels had reviewed her results and begun to analyze her data. She was clearly excited about the overall passing rate of all of her students. When asked about the performance of the African American students she commented, “...well, they went up over 10 points which was really just – it was our goal”.

During her initial interview Ms. Michaels emphasized how important it was to her as the department chairperson that the science teachers were aligned with one another, both in their scope and sequence of the curriculum and in the strategies they used with their students. She used the term “we” often to describe what occurred while

teaching students. She talked about how "...we can be more consistent about how we are teaching things, and presenting things and approaching things".

She also discussed how each teacher would review test data with students after they took a test to make sure all the concepts were understood and corrections were made so that students knew why they answered certain questions incorrectly.

One additional strategy Ms. Michaels mentioned after the results were returned was the use of a retired science teacher who met with students in small groups to review science concepts. This retired science teacher was hired by the district and was provided with a curriculum to review important concepts that were likely to be included on the TAKS test. Students were typically pulled out of an elective class once a week to meet with the retired science teacher. She thought this strategy was also helpful in increasing the overall scores for science.

In the interview after the results were returned Ms. Michaels continued to reiterate one of the main reasons the department was more successful during the 2009-2010 academic year over the previous year was that all of the teachers on the team worked together to be consistent with their teaching strategies and following the scope and sequence.

"I think everyone staying on the same page helped us so much because it was really about the good of the group. Every kid exceeded their own personal whatever. You know, I want them all to pass 100%, but some of the kids that didn't pass they came really close. Closer than I feel like they would have come had they not been given certain specific instruction and strategies and attention".

In his second interview Mr. Ryan pointed out the fact that during the 2008-2009 academic year one teacher had most of the at-risk students in his classroom. This teacher was not part of the interview set because he is no longer at the campus. During the 2009-2010 academic year, the at-risk students were spread among all the science teachers. This information will be addressed in the next chapter.

Mr. Kelley spoke specifically about the team focusing on improving vocabulary and using hands-on activities in the classroom. When speaking about the vocabulary focus he stated, “We’re focusing a little bit more on vocabulary, straight out vocabulary. While we still do the hands-on stuff, we’re pointing out that vocabulary”.

The focus on vocabulary was a change from the 2008-2009 academic year. Mr. Kelley talked about the use of hands-on activities helping the previous year, but because of the need to increase the scores of all students they decided as a department to increase the vocabulary building and add to the hands-on activities. As it relates to working as a team, Mr. Kelley said he taught in the same way that the other science teachers did with his students.

At the conclusion of his second interview Mr. Kelley added the importance of the science department working together during the 2009-2010 academic year in order to plan lessons and teaching strategies. He agreed with Ms. Michaels that this was a positive change from the previous year that he felt also added to the success of the students.

“I feel like I’m more a part of the team than I was in the past. (During) planning and having more to say; before, I’d have one or two on-level classes and the rest

were IPC(integrated physics and chemistry) so I would kind of let them (department) dictate where it went and didn't do as much as – I didn't participate as much as I could have at the planning”.

Mr. Kelley noted he had to participate in the planning during the 2009-2010 academic year, and it was helpful and different from his level of participation the previous year. Mr. Kelley also mentioned two other activities - after school tutorials and a Wednesday TAKS Blitz as helpful strategies contributing to the increase in TAKS scores.

### **TAKS Warm Up Booklets**

An additional strategy discussed by Mr. Ryan was the use of TAKS booklets with students this year. He didn't mention this in the first interview but explained the booklet contained TAKS-type questions and all the teachers used the questions as daily warm up activities. The warm-up booklet was created by the eighth grade science team leader as a way for the students to have the opportunity to review concepts and to practice answering questions formatted like they would be asked on the TAKS test. Mr. Ryan also indicated he would likely use the TAKS warm up booklets again the following year as a strategy. This was another example of the eighth grade science teachers working as a team.

Ms. Kent additionally discussed how the team used the warm up booklets to help students practice TAKS-like questions and test testing strategies. She indicated these booklets also helped to develop the stamina of students for the actual testing session.

When reviewing from the warm up booklets the students learned how to break down parts of the questions and answers for better understanding.

### **Team Use of Retired Science Teacher**

In agreement with Ms. Michaels, Mr. Ryan also mentioned the ability to include the retired science teacher to help struggling students review concepts as a helpful strategy during the 2009-2010 academic year. He indicated the retired science teacher was able to meet with students in small groups to review specific TAKS test objectives by doing fun activities and labs. The students were placed in small groups in order to receive specialized attention from the retired science teacher.

### **Team Taking Responsibility to Teach Struggling Students**

One additional point made by Mr. Ryan had to do with the grouping of students during the 2009-2010 academic year. He mentioned the importance of allowing more than one teacher focus on the students who need the most help. Mr. Ryan thought it was important to have struggling students in the same classroom with students who grasped the material more readily,

“Having them with other students who you knew were going to pass, I think helps encourage them to want to do a little better. So I think spreading them, this year as opposed to last year, was a big thing”.

Ms. Kent reiterated the use of recapping and anchor charts throughout the academic year helped to review major concepts for teachers. In her second interview she added information indicating there was a teacher on the team the previous year that did not follow the plans set out by the department. She noted that this year, all team

members were on board, worked and planned together to make sure all the students received the support they needed in order to be successful.

### **Use of Quantum Learning (2008)**

Although the science teachers decided to use severalThe use of Quantum Learning (2008) strategies was a re-occurring theme throughout the interviews with the teachers. Ms. Michaels mentioned that in the 2008-2009 academic year the department did a good job of giving the students a practice TAKS test then “pulling students into their advisory periods for one on one help”, but because the group of (African American) students during the 2009-2010 academic year were “more kinesthetic than the other sub-pops” they tried using more Quantum Learning (2008) techniques during the 2009-2010 academic year. Ms. Michaels talked specifically about the Quantum Learning (2008) strategy of using anchor charts as a major teaching strategy added during the 2009-2010 academic year. The science department only used anchor charts during the spring of 2009, but they had “done them from the get-go on, along with a body mnemonics and a little speech that goes with it” during the 2009-2010 academic year. Ms. Michaels said all the teachers, “...made more of a conscientious effort to incorporate that (anchor charts) in every single, main concept that we taught”.

She described the anchor charts and the body mnemonics as ways to help the students to remember a concept,

“And then when we say it – instead of me saying top of the head – mid – torso- we were actually sing-singing –crust- and move around a little bit. Mantle – outer core- inner core. Yeah, they can kinda dance around it if they feel like it . If



they're comfortable. Some are comfortable and love it, some look at me like I'm nutty. It depends on their personality”.

Ms. Michaels also talked about the concept of re-capping. She explained this as a Quantum Learning (2008) strategy the math department used for the past year. The science department only did a small portion of Quantum Learning (2008) strategies, but, according to the math department, students really benefited from it in math. Recapping is a way to review what was previously learned so students don't forget it. They also tied it to their anchor charts. She explained,

“...at the beginning of the unit, we recapped the last unit and at the end of the unit we recapped the entire unit and then the next day we recapped the entire year. Then when we were working on something it maintained the position at the front of the room to show its importance and then when we were done, we put it at the back of the room. Not to dismiss it, but to remember. And then also they could always refer to it as a visual when they were testing”.

After the TAKS test results were returned Ms. Michaels indicated she “was very pleased” with the results. The overall pass rate was 96% with 90% of the African American students passing. When asked about the specific strategies she felt led to the positive results she cited the Quantum Learning (2008) strategies – call backs/body mnemonics, recaps, and the anchor charts as important new strategies that she believed had a positive effect on the higher pass rate for TAKS.

Mr. Kelley also cited the emphasis of Quantum Learning (2008) strategies as being helpful, “They got to actually experience the stuff, not just read about it. I think

that's probably the biggest part of it... (It) kept them focused, kept them more engaged with the material". He talked about using many of the Quantum Learning (2008) strategies in the 2009-2010 academic year he didn't know or use the previous year, "...anchor posters, a little more music, different technologies of smart board". Mr. Kelley continued to emphasize the importance of the brain-based Quantum Learning (2008) strategies as well as the emphasis on vocabulary building with the students.

During his initial interview Mr. Ryan focused on the Quantum Learning (2008) training he received during the previous summer and how he incorporated those strategies in his classroom with his students. He emphasized the importance of repetitiveness in making sure his students were learning. When asked about what he did differently in the 2009-2010 academic year from the previous year he replied,

"A lot more Quantum Learning. I wasn't quantum learning trained last year, and I took day 1-2-3 of QL last summer. So I incorporated a lot of the lighting, the music, the mnemonics, doing the hand motions, the posters, (a) lot of repetitiveness to try to get those things to sink in"

Mr. Ryan also mentioned using music and lower lighting in the classroom. When asked if he had used any of these methods the previous year he replied, "I didn't do any of that last year".

After the TAKS test results were returned Mr. Ryan continued to emphasize the importance of using Quantum Learning (2008) strategies with his students and how these strategies "helped a ton". He talked specifically about the repeated review strategies they used from the beginning of the year "keeping it fresh on their minds". He

discussed how each day there was time to review major concepts and big ideas. These concepts were placed on posters and referred to daily and throughout the academic year. Reviewing the posters along with using the body mnemonics served as a daily review for every student in science.

When asked about the teaching strategies used during the 2009-2010 academic year that were different from the previous year, Ms. Nichols discussed the use of mnemonic devices and pictures on the wall. The wall pictures were used as anchor posters or anchor charts. She indicated the anchor charts were used as supplemental aides for the students she worked with. Supplemental aides were used to assist students on their TAKS test if the supplemental aide was used on a regular basis in the classroom. The anchor charts were used for her students daily as a way to recap or provide a repeated review of concepts. During her initial interview she expressed the need for a way to provide the repeated reviews for the students. "Recapping is something that we really didn't do last year, so recapping and the posters helped with the repeated review process". When asked about strategies used to close the achievement gap with the African American students she said she was anxious to see if any of the Quantum Learning (2008) strategies of recapping, posters, and music would have any effect. She did mention the music helped to get them more involved.

During her second interview, after the science scores were returned Ms. Nichols said she felt "good" about the scores. Overall, her special scores were up to 90% passing from 88% the previous year. When I asked her about the scores for African American

students she said, “We had a huge difference. I’m trying to remember if it was 13 points or something like that, it was big”.

I asked her about specific strategies she felt led to the increase in scores. Her reply was similar to her first interview, “I think the posters around the room that we used. Also, we incorporated those as our supplemental aides before the test, were big...and all the quantum learning strategies...the recapping”. She also mentioned the use of narrative chains. This is another Quantum Learning (2008) strategy that she said they didn’t use a lot, but some students remembered them and would refer to them, “...we didn’t use a ton of those, but three of four of the kids still always remembered those at the end”.

Just before the end of the second interview Ms. Nichols mentioned the professional development day for teachers held prior to the beginning of the year. She called it the “Quantum Learning Day”. It was a day designed to reinforce Quantum Learning (2008) strategies for teachers who had been previously trained. It also provided an opportunity for teachers to prepare their classrooms to have an inviting atmosphere when students arrived. She mentioned this day would be good to incorporate at the beginning of the next year as well.

“A lot of those strategies we didn’t use last year. In looking at the difference in the scores from last year to this year, those strategies obviously had to have a positive impact on some of those kids that maybe weren’t reached in years previous”.

Ms. Kent also talked about anchor charts, “I used the anchor charts before, but I never recapped them. So I recapped those. I had the kids recap them, which is interesting because it goes down a lot harder”. The recapping served as a method of review to make sure the students were grasping the concept. Ms. Kent said it was a way to make the students use their brain,

“I kept telling them, ‘see, it’s really easy to sit and listen, but when you have to do it, that’s when you really need your brain. I think a lot of them are real idle. They don’t use their brains. It looks like they’re learning. It looks like they’re doing the work, but they’re not really. They’re not really doing it. Making them write it out or saying it – they’re like – “oh, I don’t really know this”.

One other strategy Ms. Kent mentioned during her first interview was tying in her daily objective to one of the Quantum Learning (2008) “8 Keys to Excellence” (p.1.15). She mentioned the 8 keys because it was different from what she did in previous years. She explained that she would use the key, commitment, for example, to make sure students understood the importance of making the commitment to complete their homework or other assignments. She also talked about using music in her classroom more during the study year versus the previous year.

In her second interview, Ms. Kent was “very excited” about the science TAKS scores. When asked again about the specific instructional strategies she used during the study year that she felt led to the success of the students overall and the African American students in particular, she said,

“I think being more active and getting the kids out of their seats and the activities that we did, the strategies that we did helped these kids; the mnemonic devices, the brain-based stuff, constantly telling them that their brain is for them to use and create...and the more you use your brain the better it’s going to be.

Teaching them how to study and using those brain-based strategies helped”.

### **Building Relationships with African American Students**

Throughout the year, relationship building was stressed. Teachers were constantly asked by the principal and I, “do you know your students?” It was important for teachers to be able to identify which students needed to participate in interventions based on data from SFA (benchmark) exams. During data digs, these questions were asked while reviewing the data. Teachers were often able to discuss students individually as well as groups of students who were getting extra assistance.

There were African American students within Ms. Nichols’ special education assignment group, but she focused on looking at each student and what worked for them individually. She mentioned that her African American students in special education seemed to be “a little bit higher level than some of those kiddos last year”. So in acknowledging the existence of the gap and the improvement in the scores she also seemed to feel the students were at a higher academic level during the 2009-2010 academic year. Ms. Nichols first interview concluded with talking about the importance of making a connection with her students at the beginning of the year,

“It’s just finding something to connect with each kid because if they feel you have that connection, I think they will feel more comfortable being able to come

to you saying ‘I don’t get it’ or asking for what they need. If they don’t feel that connection then they don’t feel like they can approach you”.

Ms. Kent talked about focusing on the African American males in her class to make sure they were working and learning. She said, “I held them responsible. You cannot leave this room until I have an answer. It showed me that they were getting it or if they weren’t getting it”.

Additionally, Ms. Kent talked about the need to engage her African American students in order to be sure they were learning. She was cautious to not try and put the African American students in a group with her comments, but she did feel like she worked harder this year to find ways to engage them or help them to physically be a part of their learning. When asked specifically about noticing the lack of engagement among the African American students she replied, “I don’t know if I noticed that about that particular group or if it’s because I’m just worried about that sub-population...I’m worried about them passing”.

When I asked her if worrying about the African American students makes her focus more on them she agreed it did. She said she didn’t tell the kids the test was a basic skills test, she told them it would challenge them, but they were up for the challenge. She wanted them to accept school and to accept the challenge to score commended on their science TAKS test. She said about her African American students, “That was my big goal was to get a hundred percent (passing)”, not just her African American Students, but all of her students.

### **Building Relationships Through the Advisory Period**

Another new strategy mentioned by Ms. Michaels was the creation of a science advisory period. All students at Spotlight Middle School are assigned to an advisory period where important school information is shared through the announcements and it is also typically considered to be a homeroom for students. During the 2009-2010 academic year, the science department selected 13 students to participate in an eighth grade science advisory, led by Ms. Michaels. During the advisory period Ms. Michaels reinforced science vocabulary with vocabulary books and gave the students practice science TAKS test questions. She also gave them an opportunity to work on their science homework and get help if they needed it. One important aspect of the science advisory was the opportunity she had to pre-teach the students concepts. Because she would see them on Monday, she had the opportunity to preview the information and homework to be covered for the week. The students then had an opportunity to ask questions in a smaller setting and when they arrived to their regular science period they had the opportunity to feel more confident because they were already introduced to the assignment. The science advisory is a time when Ms. Michaels can give the students one-on-one attentions. She states about the science advisory period,

“...but I get the best results when I really sit down with them one on one and really focus on certain things. Yes, I use it to remind them of the strategies that are used in the class – and it also helps them in class – they like they’ve gotten my one on one attention then when they go back to class they have a leg up on the other students which makes them excited”.



She talked about the advisory time as “very risk free...sometimes they just need extra time”. Of the 13 students enrolled in the advisory period, five of them were African American.

In addition to the Quantum Learning (2008) strategies Mr. Ryan discussed making parent contacts early in the academic year.

“I did a lot more parent contact this year than last year instead of waiting. You know, if a student wasn’t turning in their homework, I’d shoot mom an email real quick. I tried to increase my parent communication this year, made it a point of initiating a few conferences”.

When asked about the effect talking to the parents had on the achievement of his students Mr. Ryan further stated,

“I think for the parents who are involved in their students’ lives to the point where they were being the parents and not being the friends, it had a huge effect. You know, I would notify mom and, “hey, your son or daughter is not getting their work done in class or they’re acting up in class”, we got an immediate response. If we called mom or dad, we got “well, we can’t do anything at home with ‘em either”...not so much”.

Additionally, Mr. Ryan emphasized that he tried to treat all of his students the same by using the same tactics, strategies and encouragement. When asked specifically about what he did in his classroom with African American students he stated,

“I think trying to treat every kid like they have the potential to be anything they want to be, no matter their background or their home life, they need to realize –

you know, try to encourage them to take care of their life and their education. They can achieve anything they desire if they're willing to put their hearts and minds to it. And I think that goes a long way with African American students, Hispanics or White kids, no matter who they are if somebody will believe in them”

### **Taking Ownership**

Most of the teachers in the study felt a sense of responsibility toward improving their scores for the different student groups. This feeling of ownership often came through during the interview process.

When talking about students being engaged and him being aware of it, Mr. Kelley said he had to check for understanding on a daily basis,

“Checking for understanding on a regular basis. Going by. When we're doing group work and stuff, stopping by the groups – specifically, even if I'm not addressing that child specifically; looking specifically at that paper so that I can keep an eye on and make sure they're just not writing down what everyone else is writing down but actually engaged in whatever we're doing”.

Although over 90% of Ms. Michael's students passed the test, she still showed disappointment over the ones who did not pass – from any race or ethnicity. She talked about reviewing the data with her students and expressing those times when a student may have missed the passing standard by one or two questions, “...you always want more, human nature, you know”. She mentioned that “pulling them in one on one gave opportunities to build relationships, (and that) helped as well”.

## **Training**

Ms. Kent, the eighth grade team leader, was very involved during the study year, implementing and modeling the strategies used by the other eighth grade science teachers. She discussed three main professional development activities that influenced her teaching strategies for the year. She was previously trained in Quantum Learning (2008) but did not use the strategies very much in the 2008-2009 academic year. She noted the anchor charts and recapping were major strategies used in her classroom during the study year. Additionally she attended the Rigor, Relevance and Relationships Conference hosted by Northwestern ISD during the summer of 2009 which helped her to think about presenting information to African American students, boys in particular, in different ways to improve their level of interest and understanding. She also mentioned attending a day of training focused on differentiated instruction in the classroom presented by a consultant from the Association of Supervision and Curriculum Development. During the training day she learned how to incorporate exit tickets in her classroom to check for understanding and also about ways to rephrase questions for students. Both strategies helped to make sure students understood the concepts taught for the day or for the unit. She gave the example, “Why does it make sense that earthquakes and volcanoes occur at the same place?” The student would answer, “it makes sense because...” If the students can explain why it makes sense, then the student likely understands the concept. She used the exit ticket as both a way to spend individual time with the students as well as to check for their understanding,

“...it gave me an opportunity to visit, especially with African American boys in my class. A lot of time if they didn’t put an answer, I held them responsible.

‘You cannot leave this room until I have an answer.’ It showed me that they were getting it of if they weren’t getting it”.

Finally, Ms. Kent talked about how she encouraged her students throughout the year, “I kept telling them they were ready”.

### **Summary**

The results of this study show that after one year of focusing on improving student achievement in science for all students, and highlighting the needs and expectations of African American students in particular, better results in science and a significant reduction in the achievement gap between European Americans students and African American students occurred.

During the study year, four major themes emerged from the meetings and interviews with participants. 1) The perception of treating all students the same regardless of race or ethnicity, 2) Teamwork among teachers, 3) The use of Quantum Learning (2008) strategies, 4) Building relationships with African American students. Responses from each participant were reported within the context of each theme. The teachers reported the importance of treating all of their students the same during the study year. As a team, the teachers planned together, and focused on vocabulary building and TAKS test taking strategies in addition to providing in time during the advisory and elective periods in order to remediate and pre-teach important science concepts. Additionally, the participants were focused on using Quantum Learning (2008) strategies

such as recapping, anchor charts and narrative chains to engage students in brain-based learning. While interviewing the teachers, many strategies were discussed. Most of the teachers interviewed discussed the strategies they used as being the same for all students, regardless of their ethnicity; however, throughout the year, the various sub-pops were constantly highlighted in team meetings to determine areas for growth and of strength.

## CHAPTER V

### DISCUSSION AND CONCLUSION

#### **Introduction**

In this final chapter I conclude with recommendations for future practice, research and systematic implementation as evidenced by the literature and findings from the study. This study was a problem of practice to investigate the perceptions of five science teachers in a suburban middle school regarding the achievement gap in science between eighth grade African American and European American students. This study sought to identify and describe the teaching methods and practices, as perceived by the science teachers, at Spotlight Middle School aimed at closing the achievement gap. When educators can identify and admit that a gap in achievement exists they may possibly work more diligently on strategies to reduce the gap in achievement. Enhancing and increasing the knowledge base on successful teaching strategies can possibly lead to a reduction in the achievement gap between African American and European American students in eighth grade science and other subjects as well.

The following questions were explored in this study: What were science teachers' perceptions regarding the achievement gap that existed for African American students in science at Spotlight Middle School? What instructional practices did science teachers perceive they used to improve achievement for African American students in science at Spotlight Middle School?

Field notes from faculty and team meetings, as well as, the semi-structured participant interviews provided a wealth of data regarding the existence of an

achievement gap, in addition to successful strategies used by teachers to reduce the achievement gap. In this chapter a summary of the research findings will be given, followed by implications and recommendations for future practice.

Throughout this study four major themes emerged: 1) Treating all students the same regardless of ethnicity, 2) Teamwork among teachers, 3) Quantum Learning (2008) strategies, and 4) Building relationships with African American students.

The first theme, treating all students the same regardless of ethnicity was repeated overwhelmingly during the interview process with teachers. Every teacher said they treated all the students the same, and used the same strategies with everyone. Each one, at some point also said about their African American students when asked, that they wanted them to perform as well as all the other students in their classes. The statements made by the teachers underscore the acknowledgement that there is a gap in African American student achievement, but not a real acknowledgement that something different may need to occur in order to close the gap.

Delpit (1988) discussed how many European American teachers may have the best intentions for their non-European American students when expressing statements such as, “I want the same thing for everyone else’s children as I want for mine” (p. 285); however, the cultural experiences that African American children bring to the classroom don’t often mirror those of European American children. Delpit (1998) further explained, European American students often enter the classroom with an internalized understanding of power relationships, but African American and other non-European American parents “want to ensure that the school provides their children with

discourse patterns, interactional styles, and spoken and written language codes that will allow them success in the larger society” (p.285).

The teachers in the study seemed convinced that treating all students the same was important in how they taught on a daily basis. However; I submit, the pressure on the teachers to improve the achievement of their African American students could have caused the teachers to exert their authority and work harder to make sure they were reaching the African American students academically. Furthermore, Delpit (1998) proposed, “Black children expect an authority figure to act with authority”, (p. 289) and tell them what they are expected to do and learn. Ms. Michaels noted her African American students were more kinesthetic, so she incorporated more activities that allowed them to move while learning. Mr. Ryan said it was important to treat each student like they had potential and encourage them to take charge of their lives. Both of these teachers, although they discussed treating everyone the same, actually adjusted their teaching in order to help increase the success of their African American students.

The second theme, teamwork among teachers was additionally resonated throughout the study year. During team meetings the teachers demonstrated their collaboration throughout the year. Teachers compared their data to each other’s and asked about different strategies that were used to help certain students grasp particular concepts. Flowers, Mertens, and Mulhall (2003) discussed the importance of teams working together in order to improve the academic achievement of middle grades students; “Our data show that the length of time a school has been teaming, particularly school with high levels of common planning time, has a positive impact on the



implementation of effective team and classroom practices” (p. 56). The eighth grade science team at Spotlight Middle School had a common planning period during the study year and they met together to plan four to five days a week. Each teacher mentioned the importance of planning together and working together as a team during their interviews. Mr. Kelley particularly mentioned the importance of working as a team during the study year compared to the previous year. He said, “I feel like I’m more a part of the team than I was in the past” and of the previous year, “I didn’t participate as much as I could have at the planning”. During their planning time the teachers decided on activities, timelines, strategies and reviewed benchmark data. The research of Mertens and Flowers (2003) showed, “teaming creates a context that enables students and teachers to better know one another and allows teachers to better understand and support the learning of students” (p.37). The practice of working together to plan, discuss, and analyze data was shown to be one key component in the improvement of student results during the study year.

The third theme that emerged among all the teachers who participated was the use of Quantum Learning (2008) strategies to improve student achievement. The Quantum Learning (2008) system included eight central components. “FADE – foundation, atmosphere, design, and environment create an empowering context in the classroom” and “PFL – presentation, facilitation, learning skills, and life skills” (p.1.12A) are the specific skills that both the educator and student use to improve their ability to learn. Each teacher in the study cited the use of Quantum Learning (2008) training and strategies as important in improving the achievement of their students.

Many of the Quantum Learning (2008) strategies involved using visual, auditory and kinesthetic (VAK) activities in order to engage students in learning. Ms. Michaels mentioned that her African American students were very kinesthetic more than once during her interviews. The inclusion of the body mnemonics and anchor charts were used as key strategies in her classes. Mr. Ryan and Mr. Kelley also cited the music, and hand motions as being helpful to help engage students and helped them to remember important concepts.

The fourth theme that emerged was building relationships with African American students. Although every teacher consistently mentioned the importance of treating all the students the same in the first theme, the last major theme suggests something different did occur. Ms. Nichols tried to find “something to connect with each kid”. Ms. Kent, “held them responsible” and wouldn’t let them leave if they “weren’t getting it”. Ms. Michaels worked with her African American students on a one on one basis to help them feel more comfortable with the concepts once they got to class. And finally, Mr. Ryan contacted parents to develop relationships and hold students accountable for their actions and school work.

The National Middle Schools Association asserted the importance of developing “close, trusting relationships between students and adults and to increase engagement with learning and feeling of positive self-esteem and belonging” (p. 2) Although none of the teachers specifically said they formed deep relationships with their students, four of the five teachers found it important to establish a relationship and try to make connections with their African American students in order to show interest in their

learning. Midgley and Edelin (1998) suggested that “relationships are enhanced when children are truly learning, and learning is enhanced when children are in a caring environment” (p. 200). The teachers in the study seemed to want their students to do well and tried to build relationships with their students as a way to improve their achievement.

### **Relationship of This Study to the Research Literature**

#### **Perception of Treating All Students the Same**

As it related to the teachers’ perception of the existence of the achievement gap at Spotlight Middle School, the teachers were aware that a gap in achievement existed between African American and European American students. According to Education Week (2004), the “achievement gap in education refers to the disparity in academic performance between groups of students. It is most often used to describe the troubling performance gaps between many African American and Hispanic students, at the lower end of the performance scale, and their non-Hispanic white peers” (p.1). “The federal No Child Left Behind Act takes aim at the achievement gap. It requires states to disaggregate student achievement data by racial subgroups of students, so that performance gains for all children can be tracked” Education Week (2004, p. 3). Additionally, due to the No Child Left Behind Act, “schools now are considered successful only if they close the achievement gap (and) many schools are struggling to make this mark” (National Governor’s Association, 2005, p. 1).

The eighth grade science teachers at Spotlight Middle School said they treated their students the same regardless of race; however, when discussing the strategies they

used during class time, and even though all students received the same instruction, the instructional strategies used were different during the study year, as a result of trying to improve the achievement of the African American students. The results of the study showed that, according to the teachers, the instructional strategies they used throughout the year helped to narrow the gap in achievement between the African American and European students. Scores for the European American students in science increased by five percentage points, Hispanic student scores increased by six percentage points, and African American scores increased by 13 percentage points. Although the teachers perceived their changes were the same for everyone, the implementation of the new instructional strategies and focus on African American students led to a double-digit gain for the school.

### **Teamwork Among Teachers**

As it related to the perception of the achievement gap, the teamwork that took place among the teachers played a great role in decreasing the gap that existed between the African American and European American students in science. The teachers met almost daily to review data and to discuss and decide on instructional strategies that would be used in the classroom. Teachers met at least three times per week to plan activities and made decisions regarding teaching and re-teaching specific concepts. Including the times the teachers met to analyze student performance data, they met a minimum of 155 times for at least 45 minutes.

Research on middle school practices insists that “curricular coordination and integration, as well as classroom instructional practices, are linked to student

achievement (Mertens & Flowers, 2003, p. 1). The teachers discussed the importance of planning together and using the same types of materials throughout the year with their students. Additionally they would analyze their benchmark and unit test data to determine which concepts needed to be re-taught. When we participated in data digs and a teacher noticed a colleague had higher scores on a particular test question, they would share the strategies used in order to teach the concept to the student so it could be replicated during re-teaching for other students. According to Allington and Johnston, 2000; Sosniak and Stodolsky, 1993 (as cited in Heller, Calderon & Medrich, 2003), “little research has been conducted on student achievement as it relates to particular instructional practices in the middle grades” (p.7). This study adds to the body of literature by citing particular instructional strategies used in eighth grade science classrooms that improved the achievement of all of the students, in general, and the African American students in particular.

### **Use of Quantum Learning (2008)**

As related to the perception of the achievement gap, using the Quantum Learning (2008) approach during the study year at Spotlight Middle School led to a narrowing in the achievement gap in science for eighth grade students. During the 2008-2009 school year the gap in science was 77% passing for African American students and 94% passing for European American students, a total of 17 percentage points. After implementing the Quantum Learning (2008) strategies during the 2009-2010 the gap decreased to 90% passing for African American students and 99% for European

American students. The gap in achievement was reduced by eight percentage points, and all the students scored in the exemplary range.

In addition to the strategies mentioned above, each teacher participating in the study overwhelmingly expressed the use of Quantum Learning (2008) strategies as having a major impact on improving the academic success of the students during the study year. Ms. Nichols, the special education teacher thought that the higher scores in science during the 2009-2010 academic year could be attributed to the increased use of anchor charts, re-capping and the use of music in the classroom, strategies that were used only sparingly the previous year. She mentioned how the music helped to get the African American students more involved in their learning while Mr. Ryan indicated the repeated review strategy of re-capping helped to keep concepts fresh on the minds of the students. Mr. Kelley agreed the use of Quantum Learning (2008), brain-based strategies as well as continued vocabulary review was an important part of the improvement in the science TAKS scores.

### **Building Relationships with African American Students**

As related to the perception of the achievement gap, the research on middle schools advised that success occurs for African American students when “providing an environment in which African American students feel good because they are challenged, work hard, and learn and achieve” (Ladson-Billings, 1994, as cited in Midgley & Edelin, 1998, p. 202). Four of the five teachers in the study discussed how they worked to build relationships with their African American students. They had high expectations for their success, while taking an interest in the student personally.

Mr. Ryan spoke specifically about holding his students to high standards and talking to them about how learning about science would affect their future. Massey, Scott, and Dornbusch (1975 as cited in Midgley & Edelin, 1998) discussed that even in cases “where teachers were not overtly racist or hostile toward African American students, they were doing great damage by expressing warmth toward black students but...not accompanying their friendliness with challenging academic standards” (p. 201). The teachers at Spotlight Middle School seemed not to fall in this category. Although they worked to try and establish relationships with their African American students, they additionally held them to high academic standards because they knew if the students did not learn the necessary concepts, they would not be successful when it was time to take the TAKS test. It seemed the teachers at Spotlight were able to navigate through the fine line of being empathetic while still holding students responsible for their learning.

### **Implications for Practice and Future Research**

In general, if academic improvement is to occur, the specific issue needing improvement must be voiced. During the study year, and prior to beginning of the academic year, the school leadership, myself included, and the eighth grade science teachers specifically discussed the importance of improving the performance of African American students in order for science scores to improve and to increase the likelihood of Spotlight Middle School earning the exemplary rating from the Texas Education Agency. During team meetings, data was analyzed and discussed to determine where gaps existed in order to improve scores on future benchmark exams and determine which

groups needed to be re-taught important concepts. Although the teachers, when interviewed, were hesitant to admit they specifically used strategies for African American students, the data, shared by them, indicated they did.

During team meetings the science teachers viewed their student data to determine areas of strength and areas for growth. If one teacher had a higher set of scores for a particular sub-pop than the others, the rest of the team would ask what was done specifically to make the students in the successful sub-population grasp the concept. The team would then plan when and how they would use the same strategy with that particular group to re-teach. Although the teachers did not mention this purposeful strategy in their individual interviews, it occurred in nearly every team meeting.

### **Current Practices at Spotlight Middle School**

When all the dust settled and TPM was calculated for all tested areas, Spotlight Middle School had earned the exemplary rating. The principal and I were elated that our biggest concern, African American students in science, had scored exemplary without the assistance of TPM. Our concerns were transferred to the areas of math for African American (83%) and economically disadvantaged (89%) students and science for Hispanic (89%) and economically disadvantaged (84%) students. Although these scores fell in the TEA recognized range, prior to calculating TPM, Spotlight had actually earned the recognized rating. Because of the decision of the State of Texas to include the TPM once again in the accountability ratings, the scores for all sub-populations in all tested areas were increased and reached the exemplary level. Spotlight Middle School had earned the exemplary rating.



For the 2010-2011 academic year, Chapter 17 of the 2010 TEA Accountability Manual indicates TPM will again be part of the accountability system, however there has been public outcry over the inflated ratings for schools and the State of Texas has is considering whether TPM will again factor into the accountability ratings. The best practice is for all schools to work to meet the actual levels of performance in order to receive the desired ratings. For Spotlight Middle School this means that this year, both the math and science teachers must fine tune their strategies in order to continue the success found during the 2009-2010 academic year, and place a continued focus on how these strategies can help the African American and economic disadvantaged students in math, and the Hispanic and economically disadvantaged students in science.

*Working as a Team.* In speaking with the science department chairperson to determine which strategies were being implemented during the current academic year to sustain and improve upon the gains made during the 2009-2010 academic year she had a lot to share. Ms. Michaels is still serving in a leadership role in the department. She said the most important thing they are doing as a department is looking at data to analyze and make decisions about how they are teaching. They review the data, discuss how each sub-population is performing, compare strategies with one another, then make plans for re-teaching. This is consistent with the research of Flowers, Mertens, and Mulhall (2003) and Merten and Flowers (2003) asserting the importance of participation in team planning, curricular coordination, and diverse teaching and learning strategies in order to afford positive achievement results to all sub-populations of students in schools.

Additionally, Ms. Michaels discussed the willingness of the team of teachers to use their advisory time to work with individual students who are struggling on certain concepts. This year the campus does not have access to the Retired Science Teacher (RST) as they did during the 2009-2010 academic year, so the teachers requested the curriculum used by the RST from the previous year, and they are implementing it during an advisory pull out program. Students still have the benefit of belonging to an advisory, but once a week they participate in structured learning sessions with a science teacher to review the key concepts they need to know in order to be successful on TAKS. This was a team decision.

Finally, I asked Ms. Michaels if any new teaching strategies were being implemented during the current academic year that weren't included during the 2009-2010 academic year. She indicated the teachers were continuing the use of Quantum Learning (2008) strategies and incorporating the additional component of enrolling or grabbing the students' interest. DePorter, et al., (1999) emphasized the enroll "creates buy-in by addressing what's in it for me (WIIFM), and taps into the learner's life", (p. 10). "Enrolling establishes rapport and commonality or relate-ability. It taps into their experience, finds the 'Yes!' response, and gets commitment for exploration", (p. 89). Ms. Michaels provided an example of an enroll used during the current academic year. She explained while teaching the Texas Essential Knowledge and Skill (TEKS) related to how humans affect the environment, she created a movie maker presentation for her students showing them the affect of the gulf oil spill, from 2010, and how it affect plant and animal life in the gulf region. The students could relate to the incident because they

saw so much of the oil spill while it was occurring, so during class they had a frame of reference to what they were being asked to learn. Ms. Michaels said for her, she uses the enroll technique to try and find an entertainment value for the students that will make them more interested in the content they need to learn.

### **Future Practice**

Just prior to the beginning of the 2010-2011 school year I was promoted to be principal at another district middle school. Although the promotion was welcomed, it was bitter sweet because of the hard work put in to Spotlight Middle School to earn the exemplary rating and not being able to share the accomplishment with the campus and especially with the science teachers. Although my new assignment was at another school in the same district, the school had very different demographics from those at Spotlight Middle School.

Faith-Hope Middle School, a Title One school that opened in 1979 had a student population of 1250 students for the 2010-2011 academic year. At the time of this study, the student demographics were African American 23%, Hispanic 43 %, European American 21 %, Asian 13% and less than one percent Native American. Faith-Hope Middle School additionally had 55% economically disadvantaged students at the time of the study. The school earned the recognized rating in the 2009-2010 academic year by using TPM in several categories; science for African American learners was one of those categories. The challenge for me after I became the new instructional leader was how can the successes gained at Spotlight Middle School be replicated at Faith-Hope Middle School? The challenge for me as a researcher was how can the gains made at Spotlight

Middle School be replicated at any middle school to improve the success of African American students in science? My recommendations, based on the results from the present study follow.

***Team Planning.*** Research on successful middle schools has clearly stated the importance of providing interdisciplinary teaming (NMSA, 1995) that affords academic and social support to students and teachers in the middle grades. Spotlight Middle School science teachers were successful in working as a team to gather and analyze data and strategically plan for student achievement. As a new principal, I quickly learned that the willingness to work as a team toward student achievement must occur over a period time and should not be assumed to exist on every campus.

At Faith-Hope Middle School, some teams were used to planning together on a regularly basis, and others typically use their planning time to grade papers and prepare for labs. Because the school district does not provide for two separate times to plan – personal and team planning, the capacity does not exist at Faith-Hope for teams (especially those in high stakes areas like science) to collaborate daily in order to plan for the success of their students. This capacity must be built over time. As the new instructional leader, one way I intend to build this capacity is to share the positive results of this study with the hope that teams will be motivated to try and duplicate the results gained at Spotlight Middle School.

***Advisory Programs.*** Additionally research from the National Middle Schools Association (1995) on successful middle schools asserted advisory programs created a welcoming environment for middle school students to build relationships with teachers

and build the self-concept of students. Spotlight had a strong advisory program that allowed students to connect with a teacher in addition to obtain tutorial assistance when necessary. Students were able to request a tutorial session, and teachers had the ability to require a student to attend a tutorial session. Those sessions were available for re-teaching, completing assignments or to make up a failed test.

When I became principal, Faith-Hope Middle School had an advisory program as well. One adjustment made to the advisory program was a tutorial component where students could request to visit their teachers on a specific content tutorial day in order to get assistance with concepts and complete missing assignments. This program was well received and expected to build capacity in future years.

As related to other characteristics of middle schools, the NMSA (1995) proposed that successful schools,

“use varied instructional practices including integrating learning experiences, addressing students’ own questions and focusing upon real life issues relevant to the student; actively engaging students in problem solving and accommodating individual differences; emphasizing collaboration, cooperation, and community; and seeking to develop good people, caring for others, democratic values, and moral sensitivity” (Research Summary p. 2).

During the study year, Spotlight Middle School engaged in various instructional practices in order to improve the achievement of their students, especially their African American students in the area of science. In addition to teaming and building relationships with their students, they implemented instructional strategies using

Quantum Learning (2008). The eighth grade science teachers at Spotlight Middle School focused on daily review by using call-backs, body mnemonics and songs (DePorter, et al., 1999) to improve the likelihood students would remember the concepts learned.

Howard (2001) discussed the verbal characteristics of African American learners and recognized that “many African American students prefer oral to written expressions”, (p. 191). The propensity for many oral activities in the Quantum Learning (2008) system likened it to the successful tenets and strategies of culturally responsive teaching. To establish linkages between culturally responsive teaching and the Quantum Learning (2008) system would be an area for future research to engage African American learners and improve their academic achievement in both suburban and urban schools.

At both Spotlight Middle School and Faith-Hope Middle School there exists room for growth, the study of culturally responsive teaching and pedagogy. The teaching strategies used in the Quantum Learning (2008) program mirror many of the tenets of culturally responsive teaching. The works of Gay (1993, 2000), Howard (2006), and Irvine and Armento (2001) will be shared during professional development activities with the instructional leadership teams at Faith-Hope Middle School in addition to the above mentioned middle schools research to begin the critical process of improvement for upcoming academic years.

## **Recommendations for Future Practice and Research**

### **What I Learned From This Study**

There were several lessons I learned from studying this problem of practice and documenting a successful solution to the narrowing of the achievement gap at Spotlight Middle School. As an African American educator and researcher I have always been concerned about the achievement of all students, and particularly that of African American students. As a mother of two African American daughters I often have been concerned that my children would receive the free and appropriate education promised to all children. My own children moved into suburban middle and high schools after spending their elementary and middle school years in very diverse urban schools. As a result, the issue of a quality education for them had always been a concern for our family. My position as a school administrator, and in particular as a Director of Instruction, enabled me to help my daughters navigate through a new system in order to find success.

Success was not automatic, however. Like anyone new to a system, we had to learn the rules and learn how to operate within those rules. There were also times where we challenged the established rules. Further, there were times when the success of all students did not appear to be the goal of their teachers, but fortunately, the majority of the teachers did desire to see all of their students achieve. However, that did not negate the fact that as parents, my husband and I had to be vigilant. We had to purposefully advocate for the effective education of our daughters. My personal experience was replicated in some fashion in this problem of practice. Purposeful and intentional

intervention on behalf of children of color and children from economically challenged environments is a cornerstone of culturally responsive teaching and pedagogy (Gay, 2000; Irvine & Armento, 2001)

During the study year, I found the teachers who participated in the study wanted to be successful teachers. They wanted their scores to be high and their students to be successful. I believed they learned that in order for their scores to be high, their students needed to be successful. These teachers learned that relationship building was important and it assisted them in the process of improvement, particularly among African American learners, When their success of the Science Department was tied to student achievement, the teachers I worked with wanted to be successful in spite of the make up of their classroom. The teachers from the study were aware they needed to try different and assertive strategies in order to improve the success rate of their African American students; however, when it was time to discuss how they did things differently and specifically for African American students, they were hesitant. It is not clear to me why most teachers were resistant to singling out students by race or ethnicity when they described and discussed their classroom practices, but the research has clearly stated that in order to ensure success among non-European students in traditional school settings, specific strategies addressing culturally responsive teaching must be implemented (Gay & Kipchoge, 2003; Howard, 2001; Ladson-Billings, 2000; 2001; 2006; 2009; and Lewis et al., 2008; and Mertens & Flowers, 2003).



### **Culturally Responsive Teaching**

Culturally responsive teaching is a theoretical model that requires deliberate attention to the needs of non-European students in order to improve their academic achievement. In order for African American, Hispanic and other non-European student groups to continue to show academic success in all classroom settings, educators must consciously attempt strategies that are culturally responsive (Gay, 2000; Howard, 2001, 2010; Ladson-Billings, 2000, 2001, 2006, 2009; Lewis, et al., 2008).

Finally, I learned that Quantum Learning (2008), could be easily classified as a culturally responsive teaching program. When the eighth grade teachers at Spotlight Middle School learned that their content area scores were responsible for the campus missing the exemplary rating, they became focused on the goal to become exemplary the following year. They knew they had to work differently in order to raise the scores of all their students, but to raise the scores of the African American students, who needed to move up 13 points, was going to take a lot of work. Although they were hesitant to admit they focused on African American students differently than other students, they willingly expressed that the changes in the teaching strategies during the study year had a significant impact on the African American students in comparison to European American, Hispanic, and Economically Disadvantaged students in science at the eighth grade level.

The Quantum Learning (2008) program was not introduced as a new instructional strategy at Spotlight Middle School during the study year. The Quantum Learning (2008) approach had been used by individual teachers throughout the building

for at least two years prior to the study year. The difference during the study year occurred when the campus leadership decided to infuse the Quantum Learning approach throughout the building. As the curriculum administrator on campus, I, along with the principal put a three-year plan in place to increase the likelihood of infusing Quantum Learning as a school-wide practice.

Although Quantum Learning (2008) has not been advertised as a culturally responsive teaching approach to learning, the tenets of Quantum Learning (2008) mirror many of the tenets of culturally responsive teaching. Armento (as cited in Irvine & Armento, 2001) cited five student engagement principles of culturally responsive curriculum and teaching. Within each of the stated student engagement principles there are tenets of Quantum Learning that were exhibited during the study year.

Student Engagement Principle 1 – Creating a purpose for learning, or  
“Why should I bother learning this?”

This principle mirrors the Quantum Learning (2008) enroll technique used at Spotlight Middle School to get students interested in learning and gave them something to relate to in order to pique their interest.

Student Engagement Principle 2 – Addressing the full range of learning modes, or “My mind is complex and unique”.

This was a way for teachers to “build on the knowledge and skills students bring into the classroom” (p.30) and to explore the prior knowledge students already possess. Both the Enroll and Experience frames of Quantum Learning (2008) provide

opportunities for students to relate their prior experiences to their current learning in order to make learning interesting and more meaningful for students.

Student Engagement Principle 3 – Considering the oral/written communication patterns of students or “Me...talk?”

Howard (2001) discussed the importance of the opportunity for African American students to use oral language in the classroom. Quantum Learning (2008) provided for oral language opportunities with call-backs, body mnemonics and songs as ways to review and demonstrate student learning.

Student Engagement Principle 4 – Considering the range of interactive patterns, or “With whom shall I work to achieve the learning goals?”

This principle highlights the need for students to have opportunities to work alone as well as in paired or grouped settings. In Quantum Teaching, DePorter, et al., (1998) explained that students often work together to review, demonstrate and celebrate their learning by teaching their peers, performing skits, and even showing off for visitors. Finally,

Student Engagement Principle 5 – Addressing the power relationships in the classroom and passing the ownership for learning to the student, or “Must I do it that way?”

provides students with alternate ways of completing assignments that meet the learning goals for concepts taught. Sometimes non-European students can easily become a part of power challenges with teachers, especially when teachers are not aware of

varied strategies. Teachers in this problem of practice learned multiple ways of teaching science concepts.

### **Multiple Intelligences**

Further, Gardner (2000) discussed the use of multiple intelligences among different students as a way of presenting and accepting assignments based on the way individuals learn best. During the study year, Quantum Learning (2008) strategies supported the use of multiple intelligences for students to show their mastery of a topic or concept by presenting learning outcomes in varied forms. Eighth grade science students were engaged in

- a. Drawing (spatial-visual)
- b. Writing essays (linguistic)
- c. Skits (interpersonal)
- d. Song (musical-rhythmic)
- e. Changing a story to make a different outcome (naturalist)
- f. Dancing or hand movements (bodily-kinesthetic)
- g. Taking on the role of a character (intrapersonal)
- h. Creating timelines (logical-mathematical)

The use of Gardner's work was already an established part of the Quantum Learning (2008) strategies. I have learned that the established tenets of multiple intelligences also support culturally responsive pedagogy. Gardner (1991) stressed the importance of not treating children as variations of the same individual by teaching all children in the same manner.

Spotlight Middle School science teachers were deeply engaged in improved pedagogy for all their eighth grade students. However, their improved pedagogy was supported by purposeful leadership engagement to ensure that they maintained a focus on the achievement of African American, Hispanic, and Economically Disadvantaged students during the course of the study year. As a result, the achievement gap between African American learners and European American learners was narrowed significantly.

### **Conclusion**

The achievement gap has been highlighted since the authorization of the No Child Left Behind Act (2001). Because the federal legislation required schools, school districts and states to report the achievement of all students by student group; schools, school districts and states have had to think differently about how they addressed the needs of all student groups. Each representative student group is highlighted with the intention to eliminate the gaps in academic achievement seen throughout the nation between European and non-European American students. Some places have been more successful than others. The present study sought to identify the strategies used at one suburban middle school to address the achievement gap in science for eighth grade African American students. The gap was significantly narrowed during the study year by teachers working collaboratively in teams to analyze achievement data and plan for teaching, building relationships with their African American students and implementing Quantum Learning (2008) teaching strategies. Implementing the strategies that were successful at Spotlight Middle School may lead to similar gains in the academic

achievement of African American and other non-European students, in both suburban and urban middle schools. This study offered one model of success.

Further, as a result of this study, the following recommendations are offered for future practice and research:

1. Observations in classrooms. The current study only included information shared by teachers in meetings and interviews about their perceptions of what they did in their classrooms. Actual classroom observations would serve to verify if reported strategies were actually used in the classroom.
2. Contributions of African-Americans to science as a part of curriculum and instruction. During the study year, information was not shared regarding African American inventors or scientists. Allowing all students to learn of the contributions of African American scholars to the field of science is recommended to enhance the current curriculum.
3. Community Engagement. The invitation of community members from institutions of higher learning and science industries to visit classrooms would provide opportunities for students to forecast themselves as future scientists.
4. Replication in urban and rural settings of leadership focus on African American learners and use of Quantum Learning strategies. In the suburban context, Quantum Learning (2008) strategies were successful in narrowing the achievement gap between African American and European American students. The utilization of these strategies in alternate contexts would possibly yield similar results.

5. Leadership development teams that include the contributions of African American male and female leaders who are well versed in Culturally Responsive Pedagogy and Culturally Responsive Teaching. Leaders with knowledge of these practices would be well suited to provide persistent engagement in varied educational settings with the intention to improve the success of all learners, especially African American, Hispanic and Economically Disadvantaged learners.
6. Research to create a culture of "Great" classrooms and schools as a result of purposeful improvement of school and district climate that systematically supports teachers in focusing and engaging culturally responsive strategies when working with African American and other non-European American students.
7. A focus on the achievement gap (Chambers, 2009) that **may** currently exist in schools. The recognition that students achieve based on what they receive from their school with the purpose of focusing on teacher improvement strategies.
8. Review of existing policies that may interfere with delivery of culturally responsive teaching strategies. Reviews should include diverse groups of parents and community advocates to objectively offer suggestions for improvement.

## REFERENCES

- Alexander, W. M., & George, P. S. (1981). *The exemplary middle school*. Orlando, FL: Holt, Reinhart, & Winston.
- Becker, B. E. & Luthar, S. S. (2002). Social-emotional factors affecting achievement outcomes among disadvantaged students: Closing the achievement gap. *Educational Psychologist, 37*(4), 197-214.
- Boyatzis, R. E. (1998). *Transforming qualitative information*. Thousand Oaks, CA: Sage.
- Chambers, T. V. (2009). The “achievement gap”; School tracking policies and the fallacy of the “achievement gap.” *The Journal of Negro Education, 78*(4), 417-431.
- Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: Sage.
- Delpit, L. (1988). The silenced dialogue: power and pedagogy in educating other people’s children. *Harvard Educational Review, 58*(3), 280-298.
- DePorter, B., Reardon, M., & Singer-Nourie, S. (1999). *Quantum teaching: Orchestrating student success*. Needham Heights, MA: Allyn & Bacon.
- Education Week (2004, September). *Achievement gap*. Retrieved from <http://www.edweek.org/ew/issues/achievement-gap/>
- Flowers, N., Mertens, S. B., & Mulhall, P. F. (2003). Lessons learned from more than a decade of middle grades research. *Middle School Journal, 35*(2), 55-59.
- Ford, D. Y., Grantham, T. C., & Whiting, G. W. (2008). Another look at the



- achievement gap: Learning from the experiences of gifted black students. *Urban Education*, 43(2) 216-239.
- Gardner, H. (1991). *The unschooled mind: How children think and how schools should teach*. New York: Basic Books.
- Gardner, H (2000). *Intelligence reframed: multiple intelligences for the 21st century*. New York: Basic Books.
- Gay, G. (1993). Building cultural bridges: A bold proposal for teacher education. *Education and Urban Society*, 25(3), 285-299.
- Gay, G. (2000). *Culturally responsive teaching: Theory, research, and practice*. New York.: Teachers College Press.
- Gay, G. & Kipchoge, K. (2003). Developing cultural critical consciousness and self-reflection in pre-service teacher education. *Theory into Practice*, 42(3), 181-187.
- Glaser, B. & Strauss, A. (1967). *The discovery of grounded theory*. Chicago: Aldine.
- Heller, R., Calderon, S. & Medrich, E. (2003). *Academic achievement in the middle grades: What does research tell us? A review of the literature*. Atlanta, GA: Southern Regional Education Board.
- Howard, G. R. (2006). *We can't teach what we don't know: white teachers, multiracial schools*. New York: Teachers College Press.
- Howard, G. R. (2007). As diversity grows, so must we. *Educational Leadership*, 64(6), 16-22.
- Howard, T. C. (2001). Powerful pedagogy for African American students: A case of four teachers. *Urban Education*, 36(2), 179-202.

- Howard, T. C. (2010). *Why race and culture matter in schools: Closing the achievement gap in America's classrooms*. New York: Teacher's College Press
- Irvine, J. J. & Armento, B. J. (2001). *Culturally responsive teaching: Lesson planning for elementary and middle grades*. New York: McGraw-Hill.
- Kahle, J. B., Meece, J. Scantlebury, K. (2000). Urban African American middle school science students: Does standards-based teaching make a difference? *Journal of Research in Science Teaching*, 37(9), 1019-1041.
- Kesidou, S. & Roseman, J. E. (2002). How well do middle school science programs measure up? Findings from Project 2061's curriculum review. *Journal of Research in Science Teaching*, 39(6), 522-549.
- Ladson-Billings, G. (1994). *The dreamkeeper: Successful teachers of African American children*. San Francisco: Jossey-Bass.
- Ladson-Billings, G. (2000). Fighting for our lives: Preparing teachers to teach African American students. *Journal of Teacher Education*, 51(3), 206-214.
- Ladson-Billings, G. (2001). *Crossing over to Canaan: The journey of new teachers in diverse classrooms*. San Francisco: Jossey-Bass.
- Ladson-Billings, G. (2006). From the achievement gap to the education debt: Understanding achievement in U.S. schools. *Educational Researcher*, 35(7), 3-12.
- Lagowski, J. J. (1995). Editorially speaking: National Science Education Standards. *Journal of Chemical Education*, 72(4). 287.
- Larke, P.J. (2010). The future of multicultural education research. *National Forum of*

*Multicultural Issues Journal*. 7(2) 3-6.

- Lee, O. (2003). Equity for linguistically and culturally diverse students in science education: A research agenda. *Teachers College Record*, 105(3), 465-489.
- Lewis, C. W., Hancock, S., James, M., Larke, P. (2008). African American students and no child left behind legislation: Progression or digression in educational attainment. *Multicultural Learning and Teaching*, 3(2), 9-29.
- Lincoln, Y. & Guba, E. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.
- Mertens, S. B., & Flowers, N. (2003). Middle school practices improve student achievement in high poverty schools. *Middle School Journal*, 35(1), 33-43.
- Midgley, C. & Edelin, K. C. (1998). Middle school reform and early adolescent well-being: The good news and the bad. *Educational Psychologist* 33(4), pp.195-206.
- NAEP (2011). *The nation's report card: Science 2009 trial urban district assessment*. Retrieved on March 16, 2011 from <http://nces.ed.gov/pubsearch/pubinfo.asp?pubid=2011452>
- National Governor's Association (2005). *Closing the achievement gap*. Retrieved on February 27, 2010, from <http://www.subnet.nga.org/educlear/achievement/>
- National Middle School Association (1995). *NMSA Research summary #4: Exemplary middle schools*. Retrieved March 2, 2010 from <http://www.nmsa.org>.
- Owens, R. G. & Valesky, T. C. (2007). *Organizational behavior in education: Adaptive leadership and school reform*. Boston: Pearson.
- Public Law 107-110 (2002). No child left behind act of 2001. Retrieved on March 1, 2011 from <http://www2.ed.gov/policy/elsec/leg/esea02/107-110.pdf>.

- Quantum Learning Network (1999, 2008). *Quantum learning for teachers: Orchestrating success*. Oceanside, CA.: Quantum Learning Network.
- Schwandt, T. A. (2001). *Dictionary of qualitative inquiry* (2<sup>nd</sup> ed.). Thousand Oaks, CA: Sage Publications.
- Scheurich, J. (2009). *The record of study as a problem of practice*. Handout, Problem of Practice Group, Texas A&M University, College Station.
- Southern Regional Education Board. *Academic achievement in the middle grades: What does research tell us? A review of literature*. Retrieved on November 28, 2010 from [www.sreb.org](http://www.sreb.org).
- Strategies for teaching science to African American students*. Retrieved on March 15, 2011 from <http://www.as.wvu.edu/~african.html#sect2>
- Texas Education Agency (1998). *Educators code of ethics*. Retrieved March 20, 2010 from <http://www.tea.state.tx.us/index3.aspx?id=1658>
- Texas Education Agency (2009). *AEIS Glossary*, retrieved on February 27, 2010 from <http://ritter.tea.state.tx.us/perfreport/aeis/index.html>.
- Treagust, D. F., Jacobowitz, R., Gallagher, J. G., & Parker, J. (2001). Using assessment as a guide in teaching for understanding: A case study of a middle school science class learning about sound. *Science Education*, 85(2),137-157.

### **Supplemental Sources Consulted**

- ASCD (2010). Caught in the middle. *Education Update* 52(7), 1-7.
- Allen, J. (2007). *Creating welcoming schools: A practical guide to home-school*

*partnerships with diverse families*. New York: Teachers College Press.

Anderson, R. D., Helms, J. V. (2001). The ideal of standards and the reality of schools:

Needed research. *Journal of Research in Science Teaching*, 38(1) 3-16.

Brown, K. A., Anfara, V. A., & Roney, K. (2004). Student achievement in high

performing, suburban and low performing urban middle schools: Plausible

explanation for the differences. *Education and Urban Society*, 36(4), 428-456.

Campbell, F. A., & Ramey, C. T. (1995). Cognitive and school outcomes for

high-risk African American students at middle adolescence: Positive effects of

early intervention. *American Educational Research Journal*, 32(4), 743-772.

Clewell, B. C., & Forcier, L. B. (2000). *Increasing the number of mathematics and*

*science teachers: A review of teacher recruitment programs*. National

Commission on Mathematics and Science Teaching for the 21<sup>st</sup> Century, Glenn

Commission. Washington, DC: Department of Education.

Darling-Hammond, L., Chung, R., & Frelow, F. (2002). Variation in teacher preparation:

How well do different pathways prepare teachers to teach? *Journal of Teacher*

*Education*, 53(4), 286-302.

Denzin, N. K. & Lincoln, Y. S. (2008). *Collecting and interpreting qualitative materials*.

Los Angeles: Sage.

Ford, D.J., Harris, J. J., Tyson, C. A. & Trotman, M. F. (2002). Beyond deficit thinking:

Providing access for gifted African American students. *Roeper Review*, 24(2),

52-58.

Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction*.

Boston: Pearson.

Gay, G (1997). The relationship between multicultural and democratic education. *The Social Studies*, 88(1) pp. 5-11.

hooks, b. (1994). *Teaching to transgress: Education as the practice of freedom*.

New York: Routledge.

International Center for Leadership in Education, Inc. (2003). *Closing the achievement gap: A practical handbook for teachers*. Rexford, NY: International Center for Leadership in Education.

International Center for Leadership in Education, Inc., *Rigor/relevance framework*, retrieved on March 17, 2010 from <http://www.leadered.com/rrr.html>.

Jackson, R. R. (2010). Start where your students are. *Educational Leadership*, 67(5), 6-10.

Ladson-Billings, G. (1995a). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal*, 32(3), 465-491.

Ladson-Billings, G. (1995b). But that's just good teaching! The case for culturally relevant pedagogy. *Theory into Practice*, 34(3), 159-165.

Ladson-Billings, G. (1997). It doesn't add up: African American students' mathematics achievement. *Journal for Research in Mathematics Education*, 28(6), 697-708.

Madsen, J. A. & Mabokela, R. O. (2005). *Culturally relevant schools: Creating positive workplace relationships and preventing intergroup differences*. New York: Routledge.

- Merriam, S. B. (1991). *How research produces knowledge*. In J. M. Peters, & P. Jarvis (Eds.), *Adult education* (pp. 42-65). San Francisco: Jossey-Bass.
- Merriam, S. B., Lee, M., Kee, Y., Ntseane, G. & Muhamad, M. (2011). Power and positionality: Negotiating insider/outsider status within and across cultures. *International Journal of Lifelong Education*, 20(5), 405-416.
- Mooney, N. J. & Mausbach, A. T. (2008) *Align the design: A blueprint for school improvement*. Alexandria, VA: Association for Supervision and Curriculum Development.
- National Middle School Association (1995). *This we believe: Developmentally responsive middle level schools*. Columbus, OH: NMSA.
- Ogbu, J. M. (1992). Understanding cultural diversity and learning, *Educational Researcher*, 21(8), 5-14.
- Ogbu, J. M. (2003). *Black American students in an affluent suburb: A study of academic disengagement*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Rodriguez, A. J. (1997). The dangerous discourse on invisibility: A critique of the National Research Council's Science Education Standards. *Journal of Research in Science Teaching*, 34(1), 19-37.
- Rotherman, A. J., Mikuta, J., & Freeland, J. (2008). Letter to the next president, *Journal of Teacher Education*, 59(3), 242-251.
- Scantlebury, K., McKinley, E., & Jesson, J. (2001). Imperial knowledge: Science, education and equity. *ACE Papers*, Issue 8, 71-83.
- Terrell, R. D. & Lindsey, R. B. (2009). *Culturally proficient leadership: The personal*

*journey begins within*. Thousand Oaks, CA: Corwin Press.

Texas Education Agency (1999). *Approved educator standards*. Retrieved March 19,

2010 from <http://www.tea.state.tx.us/index2.aspx?id=5938>.

Tobin, K., Seiler, G., & Smith, M. W. (1999). Educating science teachers for the sociocultural diversity of urban schools. *Research in Science Education*, 29(1), 69-88.

Uhlenberg, J. & Brown, K. M. (2002). Racial gap in teachers' perceptions of the achievement gap. *Education and Urban Society*, 34(4), 493-530.

Webb-Johnson, G. (2002). Are schools ready for Joshua? Dimensions of African-American culture among students identified as having behavioral/emotional disorders. *Journal of Qualitative Studies in Education*, 15(6), 653-671.

Wenglinsky, H. (2004) Closing the racial achievement gap: The role of reforming instructional practices. *Education Policy Analysis Archives*, 12(64), 1-24.



**APPENDIX A****INTERVIEW QUESTIONS****Principal**

1. What is your role as principal as it relates to student achievement?
2. What is your goal for science achievement for the 2009-10 school year?
3. Do you have a specific goal for African American student achievement in science?
4. What are you doing differently this year than you did last year in order to achieve these goals? Please be specific.
5. What do you think contributed to the performance in science for the different sub-populations? (Compare 2008-09 to 2009-10)
6. What do you think has contributed to the achievement gap for African American students at this school?

**Science Department Chairperson**

1. What is your role as the department chairperson as it relates to student achievement?
2. What is your goal for science achievement for the 2009-10 school year?
3. Do you have a specific goal for African American student achievement in science?
4. What are you doing differently this year than you did last year in order to achieve these goals? Please be specific.
5. What do you think contributed to the performance in science for the different sub-populations? (Compare 2008-09 to 2009-10)
6. What do you believe contributed to the performance of African American students on TAKS last year?
7. Are there teaching strategies used by science teachers that weren't used last year?

**Teachers**

1. What is your goal for science achievement for the 2009-10 school year?
2. Do you have a specific goal for African American student achievement in science?
3. What are you doing in your classroom differently this year than you did last year in order to achieve these goals? Please be specific.
4. What do you think contributed to the performance in science for the different sub-populations? (Compare 2008-09 to 2009-10)
5. What do you believe contributed to the performance of African American students on TAKS last year?
6. What teaching strategies are you using this year that are different than what you used last year?

**APPENDIX B****POST INTERVIEW QUESTIONS**

1. How do you feel about the scores?
2. What changes did you notice about the scores of AA students in particular?
3. Do you believe there were specific instructional strategies that led to the scores?  
Be specific.
4. What specific strategies will you use next year with all your students? African American students?
5. Comparing 2008-09 to 2009-10, what do you think contributed to the difference in scores?
6. How might I contact you over the summer to review your responses?

**APPENDIX C****SFA THOUGHTS/QUESTIONS TO DISCUSS****Strengths**

1. On which objective(s) were students most successful? Why?

**Areas of Concern**

2. On which objective(s) were students least successful? Why?

**Sub-Populations**

3. What gaps do you see?

**Adjustments**

4. What curriculum and/or instructional adjustments will be implemented

## APPENDIX D

### TEXAS A&M UNIVERSITY DIVISION OF RESEARCH AND GRADUATE STUDIES – OFFICE OF RESEARCH COMPLIANCE

**TEXAS A&M UNIVERSITY**  
**DIVISION OF RESEARCH AND GRADUATE STUDIES - OFFICE OF RESEARCH COMPLIANCE**

1186 TAMU, General Services Complex  
College Station, TX 77843-1186  
750 Agronomy Road, #3500

979.458.1467  
FAX 979.862.3176  
<http://researchcompliance.tamu.edu>

Human Subjects Protection Program

Institutional Review Board

---

**DATE:** 26-Apr-2010

**MEMORANDUM**

**TO:** HENRY, CHERYL T  
77843-3578

**FROM:** Office of Research Compliance  
Institutional Review Board

**SUBJECT:** Initial Review

---

**Protocol Number:** 2010-0302

**Title:** Examining the achievement gap among African American students in eighth grade science: A case study of educators in one suburban middle school

**Review Category:** Exempt from IRB Review

---

It has been determined that the referenced protocol application meets the criteria for exemption and no further review is required. However, any amendment or modification to the protocol must be reported to the IRB and reviewed before being implemented to ensure the protocol still meets the criteria for exemption.

---

**This determination was based on the following Code of Federal Regulations:**  
(<http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.htm>)

45 CFR 46.101(b)(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior, unless: (a) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (b) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

---

**Provisions:**

This electronic document provides notification of the review results by the Institutional Review Board.

**VITA**

Name: Cheryl Turner Henry

Address: Department of Educational Administration and Human Resource  
Development (EAHR)  
Texas A&M University  
4226 TAMU  
College Station, TX 77843-4226

Email Address: [cherylthentry@sbcglobal.net](mailto:cherylthentry@sbcglobal.net)

Education: B.A., Psychology and Afro-American Studies, The University of  
California at Los Angeles, 1988  
M.A., Education , Stanford University, 1989  
Ed.D., Education, Texas A&M University, 2011