To the Graduate Council:

I am submitting a dissertation written by Xiomara Reid Romine entitled “The Relationship of Personal and Professional Teacher Diversity Belief Typologies to Average Student Mathematics Achievement in Middle Schools Serving the Diverse Populations of North Georgia.” I have examined the final electronic copy of this dissertation and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education, with a major in Learning and Leadership.

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THE RELATIONSHIP OF PERSONAL AND PROFESSIONAL TEACHER DIVERSITY BELIEF TYPOLOGIES TO AVERAGE STUDENT MATHEMATICS ACHIEVEMENT IN MIDDLE SCHOOLS SERVING THE DIVERSE POPULATIONS OF NORTH GEORGIA

A Dissertation Presented for
The Doctor of Education
Degree
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Xiomara Romine
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DEDICATION

To my sister

NaJuana Lee

and my mother

Nancy Rose

Words cannot express my gratitude for all the love
and support you have given me
ACKNOWLEDGEMENTS

I would like to express my appreciation to my husband, Ronald Romine Jr, for living with me and encouraging me throughout the years. You have been there with me during this entire journey and I could not have pursued my dream without you. To my children, Jordan S. Romine and Shelby L. Romine, I am proud to be your mother and appreciate your support. And to my grandmother, Audrey Jones, you are amazing. You have been there for me my entire life and are truly the meaning of unconditional love.

I would also like to thank Dr. Vicki Petzko and Dr. Hinsdale Bernard for agreeing to serve as co-chairs on my committee and for giving me the invaluable knowledge and support that I needed. Special thanks to Dr. Chrystal Partridge for serving on my committee and always encouraging me throughout this process. I would also like to thank Dr. Sandra Watson for serving on my committee and for pushing me to produce the best dissertation possible. Thanks also to Becca McCashin for answering my endless questions and providing guidance as I worked toward this degree.
ABSTRACT

Prior research has indicated that teacher beliefs can negatively affect teacher behavior. These beliefs often include unrecognized prejudices/biases regarding diversity including race, class and gender, which can lead to learning, communication and achievement issues between diverse students and their teachers. The main purpose of this research was to determine the relationship of both personal and professional teacher diversity belief typologies to student achievement in middle level math classrooms in North Georgia in 2009. The study attempted to answer the following research questions:

1. What were the personal/professional diversity belief typologies for middle level teachers who teach diverse populations?

2. Was there a significant relationship between teacher diversity belief typologies and teacher demographics (ex. Race/ethnic background, gender, age, years teaching, education level, exposure to diversity training, participation in multicultural training and/or cultural experiences)?

3. Was there a significant relationship between diversity belief typologies and average student mathematics achievement scores (ASMA) of teachers in middle and elementary schools serving diverse populations?

The Personal Beliefs About Diversity Scale (PerBADS) and The Professional Beliefs About Diversity Scale (ProBADS) were used to classify teacher diversity belief typologies. Teacher ASMA scores were determined by averaging the final percentage based score of both the highest achieving and lowest achieving classes.
Four typologies were developed based on the combined scores from the ProBADS and PerBADS. The four typologies were as followed: High Professional/Low Personal (Typology 1), High Professional/ High Personal (Typology 2), Low Professional/Low Personal (Typology 3) and Low Professional/ High Personal (Typology 4). No significant relationship was found between teacher diversity belief typologies and the teacher demographics of race/ethnic background, gender, years teaching, education level, frequency of exposure to diversity, participation in multicultural coursework and/or cultural experiences. However, there was a significant relationship between having a gay/lesbian personal friend(s) and teacher diversity belief typologies. No significant relationship was found between teacher diversity belief typologies and teacher ASMA scores. Identifying these types of beliefs and understanding the potential impact on students is imperative if we want to impact and increase achievement for diverse students.
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CHAPTER I

OVERVIEW OF THE STUDY

Background

Diversity can cover a wide range of issues, including race, ethnicity, social class, gender, religion, languages, and sexual orientation (Pohan & Aguilar, 2001). Beliefs and preconceived expectations regarding these issues can directly affect the way in which teachers respond to and teach diverse student populations. Many studies over the last thirty years have focused on teacher beliefs and how they impact classrooms (Foster, 1990, 1993; Ladson-Billings, 1995). The results of these studies have shown that the perceptions, beliefs, and attitudes of teachers are the leading predictors of teacher behavior in the classroom (Pohan & Aguilar, 2001).

Upbringing directly impacts beliefs and/or expectations, and the background experiences of teachers are often very different than the background experiences of the students they teach (Irvine, 1997). Coming from a White, middle class, English-speaking background, many teachers may encounter difficulty finding connections with and/or serving as a role model to diverse students (Villegas & Lucas, 2002).

Another factor impacting teacher response to diversity issues is cultural awareness. Cultural awareness can be defined as being aware of, sensitive to, and/or understanding of the differences among various ethnic groups (Adams, 1995). Developing cultural awareness typically requires making changes in one’s ingrained beliefs and attitudes toward cultural differences. Traits of openness, the ability to
adapt, and acquired/learned skills are all qualities of cultural awareness and sensitivity (Adams, 1995). Cultural awareness is the first step toward cultural competence. Lindsey, Robins, & Terrell (2003) describe cultural competence as connecting with those from differing cultural groups by acknowledging and valuing their differences, reflecting on skills regarding cultural awareness, using/acquiring continuous knowledge and/or resources, and adapting the ways in which an individual connects and relates to those whose culture is different from his or her own.

Previous research has shown that many issues affecting student progress and achievement occur because of the cultural differences between teachers and students (Tettegah, 1996). These cultural issues often occur because of the difference in racial and/or ethnic identity/beliefs (Foster, 1990, 1993; Ladson-Billings, 1995). The idea that perceptions/beliefs are affected by one’s racial identity is called Racial Identity Development Theory. According to Helms & Carter (1990):

> Attitudes and characteristics are based on interactions between the self and the external environment, the latter of which includes inanimate as well as animate constructs. Racial identity can thus be seen as incorporating those aspects of personality and attitudes that are based on one’s membership in a particular racial group. (p. 152)

Gay (2000) believes culturally responsive teaching is needed to address many of the current problems facing education. Barnes (2006) expands on Gay’s view by stating: Culturally responsive teaching facilitates and supports the achievement of all students. It requires teachers to create a learning environment where all students
are welcomed, supported, and provided with the best opportunities to learn regardless of their cultural and linguistic backgrounds. (p. 85)

Many schools are beginning to focus on the projected shifting diversity of students. Twenty years ago, only one in four students was a minority child. Future projections estimate that by 2020, minority students will increase to approximately one in two, and many of these students will come from families that fall below the poverty line (Pallas, Natriello, & McDill, 1989).

A growing issue related to the increasingly diverse population is the lower academic achievement of many minority students. Studies have suggested that although the cause of these problems is very complex, lack of equity has been determined as a root cause (Banks, 2001; Ladson-Billings, 1994). Jones and Fennimore (1990) state:

Too often schools do not legitimize the knowledge or experiences these [minority] children bring to schools. Instead, schools are most likely to label these children as failures because their backgrounds- usually their language and culture- are seen as inadequate preparation for learning. (p. 16)

According to Banks’ (1998A) philosophy of multiculturalism, diversity issues, regardless of what type or characteristic, should not interfere with a student’s ability to learn. Students with cultural backgrounds that differ from the majority of the student population may face communication issues, discrimination, and/or lower expectations. Teachers willing to examine their preconceived beliefs and develop culturally aware practices can aid these students in overcoming barriers that may keep them from experiencing the same educational opportunities as their peers.
In response to these issues, there have been changes in curriculum, instruction, and multicultural/diversity education and/or training (Sleeter, 1992). Shifts in methods for teaching pre-service teachers have also been seen in teacher education programs. Research has facilitated a trend to examine who is the ideal candidate for teacher education and the best course for training (Ahlquist, 1991). Issues regarding race, gender, and social class have been topics of increasing focus and research (Gomez, 1993). Pre-service teachers’ beliefs and attitudes regarding students of a different race, culture, or social class must be examined in order to create programs and experiences that will challenge these beliefs and positively impact teachers and their students (Gomez, 1993). Grant (1992) notes:

From a multicultural perspective, all students should receive an education that continuously affirms human diversity—one that embraces the history and culture of all racial groups and that teaches people of color to take charge of their own destinies….With regard to teaching, a multicultural perspective assumes that teachers will hold high expectations for all students and that they will challenge those students who are trapped in the cycle of poverty and despair to rise above it. (p. 31)

Statement of the Problem

Cultural sensitivity/awareness and diversity are becoming increasingly important issues in education. Burns, Keyes, and Kusimo (2006) state, “As America becomes more and more ethnically diverse, there is a growing acknowledgement that cultural proficiency is important for teachers” (p. 15). Predictions show that the demographics in
the United States will soon undergo drastic changes. Marx (2002) reports that by 2050 non-Hispanic Whites will fall from 64.2% of the population to 46.2%, while Hispanic children and Asians will show the most increase from 16.2% to 30.5% and 4.2% to 9.2%, respectively. African American and Native American children will have a slight decrease, with African Americans declining from 14.5% to 13.3% and Native Americans moving from 1.0% to 0.9%.

The socioeconomic gap between teachers and their students can be problematic. In the 1960s under Presidents Kennedy and Johnson, the poverty level dropped from 22% to 12.6% (U.S. Bureau of the Census, 1999). In 2008, the poverty rate held steady at 12.5%, but the number of children experiencing poverty increased to 18%, up .6% from 2007 and up 3.1% from 1970 (U.S. Bureau of the Census, 2008). This increase makes children the fastest growing group of people living in poverty (Seccombe, 2000). Typically, the teachers who teach these children come from middle class backgrounds, which can hinder the way in which they relate to and communicate with students from lower income families (Murrell, 1994).

While the student population is changing drastically, the teaching force is staying the same. The majority of current teachers and prospective teacher candidates are predominately White, and many of these teacher candidates do not have the opportunity during the course of their training to develop skills or increase their knowledge regarding cultural and/or diversity issues (Grant & Gillette, 2006). Multicultural coursework is often limited in higher education and many teacher education programs do not offer and/or require these courses for graduation. Lack of knowledge and/or inadequate
training can lead to problems in the classroom. Pohan and Aguilar (2001) state:

Clearly, if schools are to better serve the needs and interests of all students, particularly students from groups that have not fared well in the U.S. educational system, then low expectations, negative stereotypes, biases/prejudices, and cultural misconceptions held by teachers must be identified, challenged, and reconstructed. (p. 160)

Bandura (1982) concluded that beliefs guide both knowledge and action including behavior and/or skills. Applied to culturally competent educators, his theory suggests that educators use their beliefs to determine what they regard as knowledge. This belief-based information will ultimately decide what actions they will take in their classrooms. Based on these observations, educator beliefs and cultural competencies can have a direct effect on how students learn (Pohan & Aguilar, 2001).

The rapidly increasing diversity among the student population in K-12 schools has led to a push for classroom teachers who have the ability to increase achievement of diverse students, regardless of their own backgrounds or personal beliefs. Although previous research has focused on teacher beliefs and effective teaching practices, a number of research gaps and misinformation remain. More research is needed in order to categorize teacher beliefs and better understand how belief-based practices can impact student outcomes, especially those of diverse students (Pohan & Aguilar, 2001).

**Purpose of the Study**

This study, conducted among middle level math teachers in North Georgia, had three main purposes. The first purpose was to develop teacher diversity belief typologies,
based on combined responses from the Personal Beliefs About Diversity Scale (PerBADS) and the Professional Beliefs About Diversity Scale (ProBADS), developed by Pohan & Aguilar (2001). The second purpose was to determine if there is a significant relationship between middle level math teachers’ personal and professional diversity belief typologies and the level of their average students’ mathematic achievement as determined by teacher assigned scores. The third purpose was to determine if there is a significant relationship between teacher diversity belief typologies and specific teacher demographics.

**Research Questions and Related Hypotheses**

The study encompassed three main aspects: (a) classification of professional/personal diversity belief typologies of middle level math teachers, (b) examination of the relationship between teacher diversity belief typologies and specific teacher demographics, and (c) determination of any relationship between teacher belief typologies and teacher average student mathematics achievement (ASMA) scores. The corresponding three general research questions were:

1. What are the personal/professional diversity belief typologies for middle level teachers who teach diverse populations?

2. Is there a significant relationship between teacher diversity belief typologies and teacher demographics (ex. race/ethnic background, gender, years teaching, education level, exposure to diversity, participation in multicultural coursework and/or cultural experiences)?

3. Is there a significant relationship between diversity belief typologies and
average student mathematics achievement scores (ASMA) of teachers in middle level classrooms serving diverse populations?

The following related hypotheses were generated from the research questions:

Hypothesis 1: There is a significant relationship between race, gender, years teaching, education level, and exposure to diversity or multicultural training and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

Hypothesis 2: There is a significant relationship between teacher diversity belief typologies and average student mathematics achievement scores (ASMA) of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

Overview of Methodology

The researcher used a causal-comparative design that attempted to investigate the relationship between teacher diversity belief typologies and teacher average student mathematics achievement scores (ASMA). The subjects of this study were middle level math teachers employed in diverse schools in North Georgia, who teach standard math courses in grades 5 through 8. Leveling courses and inclusion classes were not included in the study. To be eligible as research participants, the teachers had to be employed in diverse schools specified by having a combined minority population greater than 25% of the total population, a mixed socioeconomic background specified by 25% or more of the population receiving free or reduced lunch, and a representation of at least four different ethnic groups from the total student population.

Participants were given two surveys adapted from Pohan & Aguilar (2001), the
Personal Beliefs About Diversity Scale (PerBADS) and the Professional Beliefs About Diversity Scale (ProBADS). Teachers were grouped into four possible typologies based on their diversity belief scores. The four possible outcomes were high professional/low personal (Typology 1), high professional/high personal (Typology 2), low professional/low personal (Typology 3), and low professional/high personal (Typology 4). Each teacher had two average student mathematics achievement (ASMA) scores, determined by averaging the final percentage based score of their highest and lowest achieving classes. Mean ASMA scores for the four groups were compared using the Analysis of Variance (ANOVA).

The resulting data was used to discover the Personal and Professional Diversity Belief Typologies for middle level math teachers, the relationship (if any) between teacher diversity belief typologies and teacher demographics, and the relationship (if any) between diversity belief typologies and average student mathematics achievement scores (ASMA).

**Significance of the Study**

Prior research has evidenced that cultural, racial, and diversity beliefs can negatively affect the learning process by contributing to confusion, conflict, misunderstandings, and inconsistencies between teachers and students (Banks, 2001; Ford, 2006; Foster, 1997). Teacher behavior, including both attitude and action, is the one factor that has had the greatest impact on student academic performance and is directly related to the deeply imbedded attitudes, beliefs, and practices that teachers hold (Barnes, 2006).
Gomez (1993) notes:

At first glance, it may not appear to be a problem that representatives of one group—White, middle-class, English-speaking people, most of whom are females—teach most of the children in the United States. However, when we add to these data findings from several large-scale studies commissioned by the American Association of Colleges for Teacher Education (AACTE), the Metropolitan Life Insurance Company, the federally funded National Center for Research on Teacher Education (NCRTE), and a smaller study conducted by Sears (1992), we develop a sharper picture of the nation’s prospective teachers. From this picture, we can begin to understand how the race, social-class, sexual orientations, and language backgrounds of prospective teachers affect their attitudes toward Others—persons different from themselves—and their willingness to live near and be a part of communities of Others, and to expect that Others can learn. (p. 461)

Atkinson and Thompson (1992) also examined the importance of teacher-student relationships. They believed that a teacher’s behavior and/or actions toward his/her students is directly linked to his/her racial identity, beliefs, and attitudes. This behavior could have a direct effect on student achievement, both current and in the future, and can also impact a student’s view of himself/herself and his/her self-worth.

**Conceptual Framework**

When teachers encounter unusual situations in which normal strategies do not work and in which there is no readily available knowledge base, beliefs become the
guiding force on which to base their actions. As previously established, belief systems have an abundance of flaws when used as filters for teacher actions. This is especially hazardous for teachers who often are engaged in over 1,000 daily contacts and interactions (Parajes, 1992).

The researcher established the conceptual framework for this study using three concepts: the domino effect proposed by Brookhart and Freeman (1992), the two-dimensional approach developed by Pohan and Aguilar (2001), and a model of teacher belief typologies based on the two-dimensional approach.

Figure 1 demonstrates how beliefs teachers hold have a domino effect on student learning. Beliefs lead to specific ideas and decisions, ideas and decisions impact teacher actions, which in turn influence student achievement. Understanding this process can help practicing teachers and pre-service teachers improve their understanding of diverse students and their classroom practices (Brookhart & Freeman, 1992).
Figure 1: Domino Effect of Teacher Beliefs on Student Learning

The two-dimensional approach used in this study was developed by Pohan and Aguilar (2001) in order to give a more holistic result by examining both personal and professional diversity beliefs. In looking at both personal and professional beliefs, one can account for certain overlapping situations where personal beliefs may conflict with
professional beliefs due to the specific context involved. In order to get an accurate reflection of these beliefs in all relevant contexts, it is imperative to measure both personal and professional beliefs about diversity.

The teacher diversity belief typology model in Figure 2 was developed by the researcher in order to categorize the responses on the Personal Beliefs About Diversity Scale (PerBADS) and the Professional Beliefs About Diversity Scale (ProBADS). The researcher proposed that teacher belief typologies and student achievement are related and can therefore be treated as interactive variables. Therefore, it was proposed that the higher the combined teacher score on the PerBADS/ProBADS, the higher the level of his/her students’ achievement. In other words, teachers who fall within the range of Typology 2 will have higher student achievement than those in Typology 1, Typology 3 or Typology 4.

Figure 2: Teacher Diversity Belief Typologies

<table>
<thead>
<tr>
<th>Professional Beliefs</th>
<th>Personal Beliefs</th>
<th>Typeology 1</th>
<th>Typeology 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low Personal</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>High Professional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>Low Personal</td>
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<td></td>
<td>High Professional</td>
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<td>High Personal</td>
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<td></td>
<td>High Professional</td>
<td></td>
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</tr>
</tbody>
</table>

*Figure 2. Teacher diversity belief typologies based on scores from the Personal Beliefs About Diversity Scale and the Professional Beliefs About Diversity Scale.*
This model shows how the scores from the Beliefs About Diversity Scales were used to develop four typologies. Cut-off points were determined that divided the scores in the two scales as low or high on personal and professional beliefs. The four typologies were based on four possible outcomes of scores as shown in Figure 2. The low and high scores of both personal and professional beliefs were grouped into the four possible outcomes of high professional/low personal (Typology 1), high professional/high personal (Typology 2), low professional/low personal (Typology 3) and low professional/high personal (Typology 4). Teachers were assigned to a typology group based on their scores from the PerBADS and ProBADS. The teacher’s typology was compared against the teacher’s average student mathematics score (ASMA).

Limitations

This study has the following limitations:

1. It includes voluntary responses to the Personal Beliefs About Diversity Scale (PerBADS), the Professional Beliefs About Diversity Scale (ProBADS) and the demographic information. It cannot be determined why participants responded a certain way to questions or ensure every question was answered.

2. It does not specify what grading procedures or mathematical processes were used to determine the numerical score representative of the average class achievement.

3. Teachers may have answered in a manner in which they perceived an answer to be correct rather than how they truly believe due to the sensitive nature of the study.

4. There were many uncontrolled outside variables that could have affected the outcome of the study. Evidence must therefore be carefully considered when determining causality.
5. Research participants were limited due to the exclusive focus on middle level math and diverse settings. Typically, elementary schools have on average two to four 5th grade math teachers, with most middle schools averaging between two to twelve 6th to 8th grade math teachers depending on school size.

**Delimitations**

This study has the following delimitations:

1. The study only included middle level math teachers who teach diverse student populations in purposely selected schools located in North Georgia.

2. Teacher ASMA scores were based on average class mathematics score using the final numerical average provided by the teacher.

3. The only instruments used to determine teacher belief typologies were the Personal Beliefs About Diversity Scale (PerBADS) and the Professional Beliefs About Diversity Scale (ProBADS).

**Assumptions**

This study has the following assumptions:

1. The teachers who participated in the study have specific diversity beliefs that determine the way in which they approach students and instruct classes.

2. The Personal Beliefs About Diversity Scale (PerBADS) and the Professional Beliefs About Diversity Scale (ProBADS) were appropriate instruments for determining the teacher diversity belief typologies.

3. Teacher responses on the Personal Beliefs About Diversity Scale (PerBADS) and the Professional Beliefs About Diversity Scale (ProBADS) were honest reflections of their true beliefs.
4. The questionnaire used to gather the demographic information was appropriate for the use in which it was intended.

5. Well-established grading procedures, based on the Georgia Professional Standards grade level recommendations for math, were utilized to determine the student’s final numerical score reflective of his/her mathematics achievement. Teachers then used these scores to determine their average math score of their strongest and weakest classes.

6. Without interventions, diversity beliefs of teachers remain unchanged.

7. Diversity in the classroom was representative of the diverse school population.

**Definition of Terms**

Terms used as defined for the purposes of this study:

- **Additive belief** is a teacher belief in which the focus is on the attributes and knowledge that students bring with them to the learning process (Freeman, 2004).

- **Assimilation** is the process whereby a minority group gradually adopts the customs and attitudes of the prevailing culture (http://www.thefreedictionary.com).

- **Assumed similarity** occurs when individuals assume that their characteristics are the correct ones and that everyone should be or should want to be like them (Wittmer, 1992).

- **Beliefs** are the attitudes, preconceptions, and values that individuals have in regards to their profession. Beliefs also can be defined as “judgments and
evaluations that we make about ourselves, about others, and about the world around us. Beliefs are generalizations about things such as causality or the meaning of specific actions” (Yero, 2002, p. 1).

- Cultural awareness is the development of sensitivity and understanding of another ethnic group. Cultural awareness usually involves internal changes in terms of attitudes and values. Awareness and sensitivity also refer to the qualities of openness and flexibility that people develop in relation to others (Adams, 1995).

- Cultural blindness is acting as if differences among cultures do not exist and refusing to recognize any differences (Lindsey, Robins, & Terell, 2003).

- Cultural capital is “the different sets of linguistic and cultural competencies that individuals inherit by way of the class-located boundaries of their family” (Giroux, 1983, p. 268).

- Cultural competence is the process of interacting with other cultural groups in ways that recognize and value their differences, that motivate one to assess one’s own skills and expand one’s knowledge and resources and that, ultimately, cause one to adapt one’s relational behavior (Lindsey, Robins, & Terell, 2003).

- Cultural conflict occurs when an individual from the dominant culture only focuses exclusively on his or her culture and does not acknowledge that other cultures exist. He or she believes everyone is the same as him or herself (Fine & Weis, 2003).
• Cultural discontinuity occurs when pre service teachers have negative beliefs and low expectations of success for [non White] students even after some course work in multicultural education (Irvine, 2003).

• Cultural destructiveness occurs when an individual participates in negating, disparaging, or purging cultures that are different from one’s own (Lindsey, Robins, & Terell, 2003).

• Cultural incapacity is elevating the superiority of one’s own cultural values and beliefs and suppressing cultures that are different from one’s own (Lindsey, Robins, & Terell, 2003).

• Cultural inversion is a phenomenon that occurs when members of a minority group specifically reject those forms of behavior, events, symbols and meanings deemed characteristics of the majority culture (Murrell, 1994).

• Cultural knowledge is an individual’s familiarization with selected cultural characteristics, history, values, belief systems, and behaviors of the members of another ethnic group (Adams, 1995).

• Cultural precompetence is recognizing the lack of knowledge, experience, and understanding of other cultures limits one’s ability to effectively interact with individuals different than one’s self (Lindsey, Robins, & Terell, 2003).

• Cultural proficiency is honoring the differences among cultures and viewing diversity as a benefit, and interacting knowledgably and respectfully among a variety of cultural groups (Lindsey, Robins, & Terell, 2003).

• Cultural reproduction theory is “a set of particular cultural, social, and
linguistic characteristics possessed by the people of advantaged backgrounds that contribute to the reproduction of the existing class structure in society through a seemingly objective, yet fundamentally biased schooling process” (Lim, 2008, p. 83).

- Cultural sensitivity is knowing that cultural differences as well as similarities exist, without assigning values, i.e., better or worse, right or wrong, to those cultural differences (Texas Department of Health, National Maternal and Child Health Center on Cultural Competency, 1997).

- Culture is a group of people who possess and share deep-rooted connections such as values, beliefs, languages, customs, and norms (Milner, 2007a).

- Deficit belief is a teacher belief in which the focus is on the attributes and knowledge that students are lacking as they start the learning process (Freeman, 2004).

- Diverse is the quality of being made up of specific characteristics or elements that differ from one another (Merriam-Webster, 2003).

- Diversity is characteristics and developmental progressions that differ from one individual to another (McDevitt & Ormrod, 2002, p. 9).

- Dysconsciousness is an uncritical habit of mind (including perceptions, attitudes, assumptions, and beliefs) that justifies inequity and exploitation by accepting the existing order of things as given (King 1991).

- Equity is the state, ideal, or quality of being just, impartial, and fair (American Heritage Dictionary, 2000). In an educational setting, equity can be expanded
to indicate a state in which all children—minorities, males and females, successful students and those who have fallen behind, and students who have been denied access in the past—have equal opportunities to learn, to participate in challenging programs, and to have equal access to the services they need in order to benefit from that education (North Central Regional Educational Laboratory, 2007).

- Equity pedagogy is the use of specific teaching methods and curriculum to aid in and enhance the academic achievement of diverse students (Banks, 2001).

- Existential presumptions are the incontrovertible, personal truths everyone holds (Rokeach, 1968).

- Facts are statements for which there is an overwhelming body of support with no contradictory evidence, rarely questioned.

- Habitus is “a system of culturally embedded dispositions shared by both the institution and individuals. [Consist of both] durable (i.e., inscribed in the social construction of one’s identity) and transferable (from one field to another) dispositions that make groups, institutions, and individuals generate practices conforming with embedded cultural principles and rules without any expressed regulation or explicit reminder of the rule” (Bourdieu, Passeron & Nice, 1990) (p. 83, as cited in Lim, 2008).

- Homogeneous is being the same or similar in characteristics (Swartz, 2003). For this paper, predominately White, female, and middle-class.

- Interculturally competent person is an individual who purposively investigate
his or her beliefs about different cultures and then use this information to interact in appropriate ways with individuals from different cultures (Friedman & Antal, 2007).

- Intercultural person is “a facilitator and catalyst for contacts between cultures” (Gudykunst & Kim, 1984, p. 230).

- Leveling courses are courses intended to prepare students for their appropriate and/or recommended level. Leveling courses are established so that the playing field can be “even” or level for those students who are not on the same/average level as the majority of their classmates.

- Middle Level, for the purposes of this study, is 5th through 8th grades.

- Minstrel approach is an instructional approach that relies on outdated, superficial or biased resources that do not present positive portrayals of minorities (Thomas, Chinn, Perkins & Carter, 1994).

- Missionary approach (or Messiah complex) occurs when teachers believe that they are meant to save students of color from their socioeconomic disadvantage or cultural issues (Thomas, Chinn, Perkins & Carter, 1994).

- Multicultural education is a field of study and an emerging discipline whose major aim is to create equal educational opportunities for students from diverse racial, ethnic, social-class, and cultural groups. One of its important goals is to help all students to acquire the knowledge, attitudes, and skills needed to function effectively in a pluralistic democratic society and to interact, negotiate, and communicate with peoples from diverse groups in
order to create a civic and moral community that works for the common good (Banks & Banks, 1995).

- Others are persons different from one’s self or in regards to the typical teaching force, it would refer to anyone not White, middle-class, female or English speaking (Gomez, 1993).

- Perseverance phenomena is the view that most beliefs persist beyond the point where logic and reason suggest they are no longer useful (Nisbett & Ross, 1980).

- Personalization is “a learning process in which schools help students assess their own talents and aspirations, plan a pathway toward their own purposes, work cooperatively with others on challenging tasks, maintain a record of their explorations, and demonstrate their learning against clear standards in a wide variety of media, all with the close support of adult mentors and guides” (Clarke, 2003, p. 15).

- Racial identity is a “Sense of group or collective identity based on one’s perception that he or she shares a common racial heritage with a particular racial group” (Helms, 1990, p. 3).

- Racial identity development theory is the notion that perceptions and beliefs about oneself and others are influenced by the particular racial group(s) to which persons belong and vary according to a sequenced process in which individuals move from a depreciating view of themselves as racial beings to a healthy and sound sense of racial consciousness (Atkinson & Thompson, 1992).
• Social capital is “the various social relationships that facilitate one’s access to other forms of capital, such as cultural and economic networks” (Lim, 2008, p. 83).

• Teacher perspectives is “a reflective, socially defined interpretation of experience that serves as a basis for subsequent action… a combination of beliefs, intentions, interpretations, and behavior that interact continually” (Clark & Peterson, 1986, p. 287).

• Tolerance approach occurs when teachers ignore multicultural issues and students therefore do not learn to value cultural differences (Thomas, Chinn, Perkins & Carter, 1994).

• “White privilege is the historical privilege of possessing the characteristics associated with being White” (Juarez, Smith & Hayes, 2008, p. 21).

• Worldview is a person’s ability to organize information about the world around him and her; it serves as the basis for one’s perspective, which is informed by culture (Helms, 1994).

**Organization of the Study**

This study contains five chapters.

Chapter 1 consists of the introduction/background, the statement of the problem, the purpose of the study, the research questions and related hypothesis, the significance of the study, the conceptual framework, the limitations, the delimitations, the assumptions, the definition of terms, the organizational framework, and the overview of methodology.
Chapter 2 contains the review of literature. The main topics include the importance of diversity beliefs, cultural sensitivity and awareness, middle level math achievement and its importance as future success indicators, and student achievement in relation to teacher practices.

Chapter 3 describes the research design, the population and the sample, the instruments used, the procedure for data collection, the data analysis procedures and the summary.

Chapter 4 presents the findings of the study. It includes the development of the typologies and the relationship, if any, between these typologies and teacher ASMA scores. Teacher demographics are presented relative to the diversity belief typologies.

Chapter 5 consists of the discussion of the findings, conclusions, and recommendations for further research.
CHAPTER II
LITERATURE REVIEW

Introduction
Definitions vary as to what specifically can be used to define individual beliefs and/or the term culture. Lindsey, Robins, and Terell (2003) defined culture as:

Everything you believe and everything you do that enables you to identify with people who are like you and that distinguishes you from people who differ from you. Culture is about groupness. A culture is a group of people identified by their shared history, values, and patterns of behavior. The purpose of culture is to assist people who are members of a group in knowing what the rules are for acceptable behavior and to provide consistency and predictability in everyday actions. (p. 5)

Problems can occur when teachers and students have different cultural backgrounds and/or styles of communication. During the teaching/learning process, barriers may form due to both parties (teacher and student) having different methods of obtaining, processing, and displaying information (Ballenger, 1999). To overcome this problem, teachers need to develop the ability to recognize the problem and respond accordingly by learning the needs of all students, especially those from different cultural, social or ethnic backgrounds (Burns, Keyes, & Kusimo, 2005). Elliott and Schiff (2001) expand on this issue by stating:
Our nation’s schools show a pattern of differential achievement across racial and economic groups. Bias and prejudice, whether or not teachers are aware of it, affect teaching, learning, curriculum and assessment. Only by transforming teachers’ attitudes and developing culturally sensitive and relevant ways to interact with and instruct students will we see the changes we want in student learning and close the achievement gaps. (p. 39)

Middle level years are perceived by many educators as the most important in terms of social and educational impact. According to the Carnegie Council on Adolescent Development (1989), middle schools are “potentially society’s most powerful force to recapture millions of youths adrift” (p. 8). Research has shown that both motivation and overall performance decreases for a large number of students as they transition from elementary school to middle school (Eccles & Midgley, 1989). Midgley (1993) states that these findings also show that the degree of change is directly related to the specific learning environment that these students encounter. Teachers can display many different attitudes and ideas that can, even without the teachers’ knowledge, have an impact on the different expectations they set for each student (Grant, 1992).

Schools can counteract this problem by providing students with an environment that will expand their academic abilities, help develop a positive sense of self, and foster relationships with accepting, supportive adults. Unfortunately the middle school setting often does not provide this type of environment during a time when adolescents need it most (Carnegie Council on Adolescent Development, 1989; Eccles & Midgley, 1989). During these years when the development of supportive adult relationships is most
important, the quality of interactions between student and teacher often diminishes (Midgley, Feldlaufer, & Eccles, 1989).

*Breaking Ranks in the Middle* (2006), a publication of the National Association of Secondary School Principals, explores the concept of personal attention further. *Breaking Ranks in the Middle* (BRIM) concedes that many students will be able to successfully pass through middle school regardless of the level of support provided or personal relationship formed with teachers at this critical level. However, if schools intend to reform strategies and provide “personalization” for all students, they will provide students with “opportunities to develop a sense of belonging, a sense of ownership over the direction of their learning, and the ability to recognize options and make choices based on their own experience and understanding of the options” (p. 129).

**The Growing Gap Between Teachers and Students**

Data collected from 1999 to 2000 show that 74.5% of U.S. public school teachers were female. The same data indicated that 84% were White, 7.8% were African American, 5.7% were Hispanic, 1.6% were Asian American and .8% were Native American (National Center for Education Statistics, 2003). By contrast, students of color made up 43% of the population in public schools. Percentages are even higher in the South and West with 48% and 55% respectively (Lee, Grigg & Donahue, 2007). Students of Hispanic origin now make up 20% of the student population. These students, along with other minorities, are represented in greater numbers in high-poverty schools. Combined, African American students and Hispanic students make up approximately 66% of students enrolled in high-poverty schools compared with only 4% of White students (Lee, Grigg & Donahue, 2007).
Teachers in today’s rapidly changing society, the majority of whom are from conventional, middle-class backgrounds, are being challenged to teach a constantly changing, highly diverse student population. Preparing teachers for this task can be problematic especially when factoring in differences in race, ethnicity, and class. These factors continue to cause teaching, achievement and communication issues between teachers and students (Murrell, 1991, 1993). The constantly increasing number of diverse students has led to a call for all schools to increase their efforts in finding teachers who can communicate with and foster growth in all types of students (Murrell, 1994).

Unfortunately, the background and educational training of teachers frequently does not assist them in or prepare them for teaching diverse populations. These individuals often do not have the opportunity to obtain relevant information and/or instructional strategies regarding culture and diversity from their professors or classmates. The majority of these prospective teachers come from suburban areas or small towns and 69% report that most of their time is spent with people similar to themselves, especially in the areas of race and ethnicity (McDiarmid, 1990). Many of these pre-service teachers also state that they prefer to work with students with backgrounds similar to their own (Zimpher, 1989). Also of concern are findings that indicate that many of these candidates believe that minority and/or low socioeconomic students do not have the capability to achieve at higher levels or learn more advanced concepts (Stoddart, 1990). Delpit (1995) states, “One of the most difficult tasks as human beings is communicating meaning across our individual differences, a task confounded immeasurably as we attempt to communicate across social lines, cultural lines, or lines of unequal power” (p. 66).
Regardless of whom or where these prospective teachers end up teaching, there is now a “moral mandate” to recruit a more diverse teacher pool and to prepare teachers with larger exposure to cultural knowledge (Grant & Gillette, 2006, p. 293). Selection and retention is especially important and emphasis should be given to identification of candidates dedicated to teaching all students. Building over the last 20 years, “culturally relevant teacher” research is a rapidly growing field with a widening base of information (Grant & Gilette, 2006).

Teachers, Future Students and Diversity

The changing student population. The term minority is currently changing in significance with the increasing diversity of classroom students. It is predicted that by 2075, minorities in the United States such as African Americans, Hispanic Americans, Asian Americans, Alaskan Natives, and American Natives will become the majority (Locke, 1992).

Connections and communication between individuals are grounded in foundational beliefs regarding race, gender, ethnicity, sexuality and social status (Aptheker, 1989). These beliefs lead to social constructs that affect both individual and public practices (Cannon, 1990). Although scholars have identified the impact of diversity categories on families, most literature regarding family studies is representative of mainstream families, those who are typically white, heterosexual and middle-class (MacDermid, Jurich, Myers-Walls & Pelo, 1992).

Student diversity characteristics fall within the range of two main categories: those that are more easily observed such as gender, ethnicity/race, age, and those that
may be harder to determine such as sensitivity, stability, sexual orientation, and social status (Nichols, 1999). Recently, there has been an increase in untraditional families. More single-parent, unmarried cohabitants, combined or remarried, and lesbian/gay families exist today than in previous times making it more difficult and less effective to gear strategies toward “typical” households (Levin & Trost, 1992). Exposure and understanding of the diversity of families is imperative, especially in teacher education, in order for pre-service teachers to be adequately prepared to teach diverse student populations (Higgenbotham, 1990; Thompson & Disch, 1992).

Although racism is not as blatant and visible today as in previous times, racism continues to be a problem in America and is still impacting minority students, especially in areas of achievement and discipline (Lewis, 2003). Cultural differences must be identified and understood. Minority students’ perceptions and behavior should not be compared against the perceptions and behaviors of the central culture (Lewis, 2003).

According to Grant & Gillette (2006), the No Child Left Behind Act (2001) has shifted the educational focus more toward obtaining and retaining content knowledge of core subject matter. The act does little to examine teacher relationships with diverse students, even though these relationships have a direct result on teacher effectiveness. Broader, more beneficial data would include defining and identifying effective teaching methods that would work for all students regardless of achievement level, social status, race/ethnicity, family dynamics, sexuality, gender or native language (Grant & Gillette, 2006). Hoy & Hoy (2006) remind us,” Creating culturally compatible classrooms will require that teachers know, respect, and effectively teach all their students.” (p. 25)
Highly diverse schools with a large population of minority and/or immigrant students have seen a considerable gap in the academic achievement of these students when compared to the achievement of White students (Gay, 2000). Hispanic students show the largest gap in terms of achievement and achievement continues to decline as these students enter middle and high school (Krashen & McField, 2005). Latino students, and other minority students, are at a higher risk of not completing high school and/or entering college (Alvarez & Bali, 2004).

The largest population of immigrants currently entering the United States comes from Mexico (Fry, 2007). These Mexican immigrant students can face specific challenges in typical American classrooms, especially in the areas of language and culture (Ruiz-de-Velasco, Fix & Clewell, 2000; Trueba, 1999). Mitchell (2009) states, “As teachers recognize the cultural disconnect between what is taught in schools (curriculum), how it is taught (instruction), and the students’ home environments, they can make a real difference in the educational achievement of all students” (p. 9). Significant progress can be made if teachers recognize and choose to respond positively to the cultural differences of the students they teach.

This group of immigrants is especially challenging due to its specific demographics. This population is in general a younger, unmarried, largely male population with a tendency to be unauthorized. They are often uneducated, and are from low socio-economic backgrounds. Their families tend to be larger than average and they are more likely to experience unemployment and/or low wages (Pew Research Center, 2010).
Minority students and students who speak languages other than English make up approximately 30-37% of U.S. students. This number is expected to grow to 46% by 2020. The majority of students in urban schools are members of this population. Schools, however, gear their main policies and curriculum toward English speaking students raised with typical American backgrounds (Salend, 2001).

The increase in childhood poverty has also made American classrooms more diverse than ever before (Pellino, 2007). These students are particularly challenging for teachers because they often experience conditions such as high-mobility, hunger, homelessness, and neglect. Pellino (2007) states, “Combine [these conditions] with the multitude of other issues faced by mobile and homeless children and the impact on their emotional, social and cognitive development can be overwhelming.” (p. 2) Teachers must take into account the effects of poverty on their students as they prepare to teach. Recognizing a student’s frame of reference can allow teachers to base lessons on prior knowledge and/or help students obtain a new knowledge base by immersing them in a variety of educational experiences (Pellino, 2007).

**Current and future teacher population.** In examining these factors in regards to the teaching force, the question becomes: why is it a problem that the majority of teachers are White, female, middle-class, and English speaking and are teaching a highly diverse population? Research shows that differences in race, social status, gender, and language can directly affect beliefs about those different from themselves, known as the “others.” This can negatively impact a teacher’s willingness to live among and teach the “others” (Gomez, 1993, p. 461).
The majority of teachers in the United States come from middle class families and were raised in rural or suburban homes (Fine & Weis, 2003). In contrast, 15% of White students, 34% of African American students and 28% of Latino students live in poverty with 25% of these students living in inner cities. The number of children living in poverty has grown from 500,000 to 13.3 million with 5.8 million living in extremely poor circumstances (Children’s Defense Fund, 2008).

Teachers may also unknowingly contribute to the problem when they base teaching methods on their educational backgrounds. Individuals who choose to be teachers often have positive memories of school and therefore often feel that the traditional schooling they encountered is effective for future students. Consensus among educational scholars is that there is a major need for educational reform. The concern is that pre-service teachers will be unable to work toward change when they believe the system they encountered was effective (Ginsburg & Newman, 1985).

Prospective teachers often use their own personal experiences and upbringing to determine how to react to the diverse students they teach. Unfortunately, this means that the majority of teachers, who are White, female and middle-class, believe that their own personal frame of reference can be applied to situations that arise with students unlike themselves. This misinterpretation can result in a lack of achievement and learning among minority students (Gomez, 1993).

Irvine (2003) defined the concept of “cultural discontinuity” with regard to pre-service teachers by stating that “pre-service teachers have negative beliefs and low expectations of success for students of color even after some course work in multicultural
“education” (p. xvi). These unfortunate expectations can lead to miscommunication between teachers and students causing negativity and bringing out deep rooted prejudices. Irvine goes on to say that cultural discontinuity leads to teachers “ignoring their students’ ethnic identities and their unique cultural beliefs, perceptions, values and worldviews” (p. xvii). This can directly impact teacher perceptions and beliefs by strengthening the idea that being different is being substandard (Freire, 1998).

In a study conducted by Tettegah in 1996, 126 White prospective teachers were given the Oklahoma Racial Attitude Scale and the Teachable Pupil Survey to assess their attitudes and perceptions regarding the teaching of various racial groups. Findings revealed that the vast majority of White pre-service teachers rated Asian American students as having more appropriate school behavior as compared to African American, White, or Latino students. The same majority also rated African American students lowest in the areas of knowing/understanding, independence, motivation and appropriate school behavior categories. Interestingly, the White prospective teachers rated Asian American students higher than any other group in most areas except for the “personal-social” category where African American students received the highest ratings (Tettegah, 1996).

In another study conducted by Paine (1989), pre-service teacher education students stated that home life, student attitudes, motivation and ability were factors that should be taken into consideration when teaching diverse populations. These pre-service teachers were concerned about treating their students equally but were not sure how to address this in the classroom. Many expressed worry that the increasing student diversity would be a problem for schools.
These preconceived ideas and other types of misinformation can also affect classroom practices. Many White pre-service teachers do not fully understand the concept of multicultural teaching. Most explain it as a technicality and believe it only involves simple inclusions of diverse materials to the current teaching materials (Vavrus, 1994). In contrast, pre-service teachers of color understand and practice multicultural education, are committed to equity and have higher standards for students of color. These future teachers have often experienced discrimination and therefore already have a predisposition to help children of color and a respect for minority children (Su, 1996, 1997).

Research conducted around the country supports the findings that a large percentage of White pre-service teachers are encouraged by the multicultural knowledge they had gained in their coursework yet still felt unprepared to teach and/or communicate with diverse students (Barry & Lechner, 1995). Schultz, Neyhart and Reck (1996) found that these pre-service teachers have often formed untrue and stereotypical beliefs about students in highly diverse or urban schools. An example of one such belief would be that cultural backgrounds do not impact the educational process and that urban students often have attitudes or behavioral problems that interfere with learning.

During the course of teacher education, pre-service teachers are also exposed to research that connects low achievement to socioeconomic status, cultural differences and home environment. These future teachers may form negative assumptions toward children who seem to “fit” in these research categories and therefore mistakenly assume that the focus should be on their shortcomings instead of their assets (Delpit, 1992).
When pre-service teachers faced inquiry as to whether or not they felt they had adequate skills to work with students unlike themselves, nearly all Black, Latino and Asian teachers affirmed their abilities and 80% of White teachers stated that they felt ready. However, when asked directly if they preferred teaching in predominately White settings all participants, regardless of ethnic group, answered affirmatively (Gomez, 1993).

Goodlad (1990) found that new teachers “were less convinced that all students can learn. They voiced the view that they should be kind and considerate to all, but they accepted as fact the theory that some simply can’t learn” (p. 264). Ahlquist (1991) adds that although many pre-service teachers are interested in learning more about multicultural education, they do not believe that sexism or racism is currently still a problem. Many teachers resolve to adopt a “color or culture-blind” view, but this way of thinking can be counter-productive. According to Lorde (1982), teachers who function under color-or-culture-blind views believe that the best means to fight racism and inequality is to not bring attention to these issues. Unfortunately, the adopting of this type of attitude often results in teachers who do not develop the racial or cultural skills or knowledge necessary to help diverse students achieve (Milner, 2007A).

Ladson-Billings (1995) state:

Too many teacher educators (and teachers) believe that they can implement an effective multicultural education program without effecting fundamental change in the classrooms and schools in which they teach. This belief contributes to the superficial and trivial treatment of issues of race, class, and gender in
Although enthusiastic to teach during pre-service and at the beginning of their career, many teachers become disillusioned with teaching due to the difficulties encountered. Twenty-nine percent of teachers leave the profession during their first three years of teaching. Thirty-nine percent leave after five years of teaching making teaching the profession with the highest turnover rate (Ingersoll, 2001).

**Educational impact of diversity.** There are multiple issues that need to be addressed in preparing European-American pre-service teachers to teach diverse populations. Differences in race, culture and social status can cause communication problems in the classroom as well as pre-service concerns (McIntyre, 1997). New teachers usually prefer to teach in communities most like their own and often express concern and discomfort in relating to ethnic families/students (Gomez, 1996). Pre-service teachers need to examine the baggage they bring with them to the field of education and develop accurate methods for reflecting on their background experiences, beliefs and attitudes (Taylor & Fox, 1996).

It is imperative that racial and cultural practices not be ignored in research, especially those that seem habitual. Identification of teacher and administrative practices that may unknowingly single out students of color can lead to modified approaches that better serve minority students (Milner, 2007b). Educational prejudices filtered through teacher and/or administrative belief systems embed themselves in the educational programs, policies, and instructional methods. Mitchell (2009), states “The intentional and unintentional messages that teachers give to their students support prejudice in the
classrooms… people function in inviting and disinviting ways, and they give these messages in an intentional or unintentional manner” (p. 17). Teachers must become aware of the messages they are sending to students in order to eliminate harmful beliefs and/or prejudices.

Due in part to the increasing diversity of the population and the impact race has on personal identity, it is important that all races develop a positive racial/ethnic identity that does not involve a feeling of predominance or disadvantage in regards to other races. This identity is usually a lifelong process that requires the individual to reject incorrect information and imbedded stereotypes (Milner, 2007B).

Race and socio-economic status are not, however, the only factors affecting the teaching and learning of diverse students. Sears (1992) discovered that attitudes of pre-service teachers toward those different than themselves also included negativity toward gay, lesbian and bisexual students. The majority of teachers expressed some level of concern for students of different sexual orientations, but deeply imbedded prejudices and ignorance regarding these types of students typically results in them receiving different treatment than their peers.

Homosexual youth are often just beginning to explore their sexual identity as they enter middle level grades. These students often face teasing, physical assault and other forms of discrimination from their classmates (Anderson, 1997). Homosexuality is more openly discussed in today’s society so homosexual youth often distinguish themselves as homosexual at an earlier age. Bias still remains against homosexual adolescents especially by their heterosexual peers. Homosexual youths are at a greater risk for
depression, suicide and under-achievement (Anderson, 1997). It is important that deterrent actions are in place for these students by the start of middle school. Diversity education and acceptance should start with schools due to the large amount of time spent there and the interaction that occurs among students (Nichols, 1999).

Gender bias in schools is another problem that needs to be addressed. Girls are often stereotyped, expected to follow standard gender roles and exhibit ‘typical’ female behaviors, which may hinder them in reaching their full potential (Sadker & Sadker, 1994). A little over a decade ago, girls had typically fallen behind boys by the high school years in the areas of academic achievement and self esteem (American Association of University Women, 1998). Currently, the focus has shifted and boys are now presumed to be the gender in danger of low achievement and teacher neglect (Kindlon & Thompson, 2002).

Despite this assumed shift from boys doing better in school to girls, the majority of students regardless of gender still feel that boys have more advantages than girls (Reay, 2001). Sadker (2002) feels that the debate over which gender is doing better in today’s classroom is irrelevant. He explains that both genders have unique characteristics, strengths and needs; therefore gender biases and/or stereotypes affect both genders and are harmful to all students.

Research has shown that teachers tend to interact more with male students than they do female students (Jones & Dindia, 2004). Behavior expectations are often lowered for male students and they are called on and/or responded to more frequently than their female classmates (Hutchinson & Beadle, 1992). Males may also receive the majority of
attention due to their increased incidences of misbehavior (Chesterfield & Enge, 1998).

Educators are also increasingly perplexed on how best to handle the rise of diverse religions exhibited by the diverse student populations that they teach. Many teachers are confused about how to address the distinct beliefs and/or customs associated with many religions and how to incorporate these cultures into their curriculum. One educator states, “Schools are the one place where all of these different religions meet. It follows that religious diversity must be dealt with in school curriculum if we’re going to learn to live together” (Kilman, 2007).

Students with disabilities also comprise a unique and challenging group for teachers. Those with learning disabilities often struggle to keep up with their classmates. Falling behind in class can lead to a lower self-esteem, lack of motivation, anxiety over performance and/or behavior problems. Many times, school programs follow a “one-size-fits-all” approach that fails to meet the individual needs of learning disabled students (Levine, 2008, p. 14). Teachers can identify individual deficiencies by observing the student and the work he or she produces. It is also important for teachers to identify the student’s strengths and utilize them as much as possible in the learning process (Levine, 2008).

Teaching in today’s highly diverse classrooms requires individuals who provide high expectations, excellent instruction, and a successful environment for all students, especially minority students and students living in poverty. Effective reform in teaching methods is needed in order to affect teacher perceptions, beliefs, and actions that hinder the achievement of culturally diverse students (McAllister & Irvine, 2000). When cultural
backgrounds are used as teachers’ and students’ reference for communication and interaction, confusion based on differences can occur thus hindering the learning process (Ballenger, 1999).

**Diversity, Beliefs, and Perspectives**

Existential presumptions are the typically unchanging, personal beliefs that all individuals hold. Rokeach (1968) believed that these often overlooked beliefs about ourselves and the world around us are so ingrained that one does not even question them. Therefore, they are widely held, very personal and cannot be changed through simple persuasion. Existential presumptions are formed unintentionally, through an extreme experience, or a series of impacting events. They include how an individual feels about himself/herself as well as how he/she views others. Research suggest that there may be a relationship between how an individual feels about his/her own racial group and the racial groups of others and his/her beliefs on social issues such as racism, injustice and inequality (McAllister & Irvine, 2000).

Hanson & Avery (2000) state, “Valuing diversity is a way in which individuals and groups within education and beyond could stand in solidarity with one another, challenge one another and empower themselves in ways that do not diminish others” (p. 121). More focus has been placed on teacher beliefs and perceptions in recent years (Pajares, 1992). These beliefs and perceptions have been linked to classroom procedures, problem solving, materials covered and grading. These beliefs not only affect these various areas by being the guiding force behind thoughts and actions, but have also shown to be consistent and unchanging (Kagan, 1992A; Kennedy, 1990).
Sigel (1985) defined beliefs as “mental constructions of experience- often condensed and integrated into schemata or concepts” (p. 351). Dewey (1933) defined belief as “something beyond itself by which its value is tested; it makes an assertion about some matter of fact or some principle or law” (p. 6). He went on to signify the importance of belief by saying “it covers all the matters of which we have no sure knowledge and yet which we are sufficiently confident of to act upon certainly true, as knowledge, but which nevertheless may be questioned in the future” (p. 6).

Pajares (1992) states:

Attention to the beliefs of teachers and teacher candidates should be a focus of educational research and can inform educational practice in ways that prevailing research agendas have not and cannot. The difficulty in studying teachers’ beliefs has been caused by definitional problems, poor conceptualizations, and differing understandings of beliefs and belief structures. (p. 45)

Beliefs are often perceived as knowledge. For example, teachers may think they know that girls have less behavior problems than boys or know that boys are better at science than girls. This type of knowledge may unknowingly affect students when teachers base their actions on this information (Pajares, 1992). Research linking poor achievement to socioeconomic levels, home environment, and cultural differences is often examined in teacher education programs. The information pre-service teachers study and receive from these examples can lead to the false assumption that the focus should be on student deficiencies rather than student strengths. Teachers must have an understanding of students’ backgrounds in order to change this focus (Delpit, 1992).
Teachers who operate under an additive belief shift their focus to students’ prior knowledge and incorporate the information and culture the student brings with him or her into the learning process. Teachers who operate under a deficit belief focus on what knowledge and/or skills the student is lacking. This negative approach can cause frustration in both teacher and student as they focus exclusively on the overwhelming task of catching up (Freeman, 2004).

Teachers and teacher educators often hold beliefs about teaching diverse students that can make it difficult to enhance teaching practices to reflect the increasing diversity. These beliefs are often based on the teaching “transmission” model and learning “absorptionist” model (Prawat, 1992). These models are based on the idea that students passively receive the information passed to them from teachers (Tatto, 1996). Believing that all children learn in a static or passive way can hinder teachers from using new and innovative ways to reach students. Any differences noted among students are typically used for grouping students rather than becoming the basis for understanding how students learn (Prawat, 1992). A teacher’s understanding of these differences and how they affect learning can determine academic success in the classroom (Tatto, 1996).

Misconceptions can also affect teacher beliefs, which can in turn affect teacher behavior. For example, during an interview one student teacher expressed her intent to teach in a private, mostly white school because she made the assumption that low parental involvement in the urban school in which she student taught was an indication that parents did not care about their children (Milner, 2007a).

Rokeach (1968) warns that:
Understanding beliefs requires making inferences about individuals’ underlying states, inferences fraught with difficulty because individuals are often unable or unwilling, for many reasons, to accurately represent their beliefs. For this reason, beliefs cannot be directly observed or measured but must be inferred from what people say, intend, or do (Pajares, 1992, p. 47). (p. 233)

Educational beliefs are formed prior to pre-service teachers entering college (Wilson, 1990). These beliefs develop during the time an individual spends in school, starting as early as kindergarten and continuously developing/strengthening through high school. These beliefs form around such topics as desired student behavior and effective teaching practices. These pre-conceived beliefs are already imbedded as individuals enter teacher preparation programs. Beliefs are formed from background experiences (Nespor, 1987). The school experiences an individual had growing up will have a direct impact on how he/she views and operates his/her own classrooms. Goodman (1988) calls these past influences “guiding images” through which we filter information. Calderhead and Robson (1991) expand on this further by explaining that these past experiences influence the way in which pre-service teachers understand and interpret teaching practices. These early formed ideas and interpretations directly determine the classroom practices they later utilize as future teachers.

Beliefs are created when an individual accepts and adopts others’ ideas. Beliefs then continue uninterrupted unless they are purposefully altered or changed (Lasley, 1980). The earlier a belief is formed and the longer held, the harder it is to change especially since beliefs influence perception and the way in which information is
processed. Unfortunately, individuals often hold on to beliefs based on incorrect information even after solid evidence has been presented. The stronghold of previously held beliefs often is more powerful than any other proof no matter how strong (Munby, 1982). Holding on to these beliefs even when no longer logical is known as perseverance phenomena (Nisbett & Ross, 1980).

Beliefs, unlike typical knowledge bases, do not require that the majority of individuals believe in their accuracy or morality. Belief based actions therefore are more unchanging and static than knowledge based actions. Individual beliefs often are illogical whereas knowledge based beliefs are reason driven and more readily explainable. Despite these inconsistencies, beliefs have more impact than knowledge in determining how individuals respond to issues and decide which actions to take in any given situation (Nespor, 1987).

Pajares (1992) states:

Beliefs color not only what individuals recall but how they recall it, if necessary completely distorting the event recalled in order to sustain the belief. Once beliefs are formed, individuals have a tendency to build causal explanations surrounding the aspects of those beliefs, whether these explanations are accurate or mere invention. Finally, there is the self-fulfilling prophecy that beliefs influence perceptions that influence behaviors that are consistent with, and that reinforce, the original beliefs. (p. 317)

A culture can be defined as a group of people who possess and share deep-rooted connections such as values, beliefs, languages, customs, and norms. A culture is dynamic
and encompasses other concepts that relate to its central meaning. The supplemental categories that make up culture include, but are not limited to, identity (race and ethnicity), class, economic status, and gender (Milner, 2007a). Many White teachers will admit to having prejudices toward individuals in the general population but claim not to have any prejudices toward students in their classrooms (Ahlquist, 1991). Too often these teaching professionals do not recognize the effect of cultural and/or ethnic differences (Atkinson, Morten, & Sue, 1993).

Racial identity development theory is based on the idea that race impacts one’s beliefs about self and others (Atkinson & Thompson, 1992). “Assumed similarity” occurs when individuals assume that their characteristics are the correct ones and that everyone should be or should want to be like them. Those who have obtained a more self-aware perception do not have these misconceptions (Wittmer, 1992).

Beliefs are typically immobile and unchanging, held as truth despite the situation. On the other hand, knowledge is dynamic and experiences occur to strengthen and/or expand the information learned (Parajas, 1992). Parajas also states:

[Researchers have] concluded that beliefs influence what teachers say outside the classroom, but their behavior in the classroom is a result of beliefs being filtered by experience. Knowledge on the other hand, represents efforts to make sense of experience, and thus knowledge, not belief, ultimately influences teacher thought and decision making. (p. 312)

Nisbett and Ross (1980) found evidence to suggest that beliefs continue to be strongly held even when it is necessary for them to be changed. Beliefs can change but
typically do not without specific interventions. Beliefs are instrumental in self-reflection and help individuals assess the world around them, identify with others, and provide structure for future endeavors. Because of the importance of beliefs on how individuals operate and/or make decisions, more focus is needed specifically on how teachers perceive their positions, their work environment and the students they teach (Nespor, 1987).

Researchers such as Sears (1992) and Gomez (1993) have suggested that a new focus is needed in examining and understanding teacher behaviors. Looking closely at the specific ideas and resulting actions of teacher beliefs can support findings that show that personal beliefs are the most influential force behind an individual’s decisions and actions (Pintrich, 1990; Bandura, 1986). Beliefs, and the attitudes one has about his or her beliefs are all interconnected. Many times, an individual’s beliefs on one topic are a direct result of beliefs formed on an entirely different subject. For example, a teacher’s feelings about an educational topic may directly stem from a belief about a societal issue. These connections are important to recognize because they “create the values that guide one’s life, develop and maintain other attitudes, interpret information, and determine behavior” (Parajes, 1992, p. 319).

**Historical Significance**

**African Americans.** African Americans experienced slavery in the United States for over 250 years. By 1790, slavery existed in all of the states except for Maine, Vermont, and Massachusetts. Approximately 94% of all slaves lived in the South. Almost 700,000 slaves were living in the U.S. at that time making 1/5 of the population slaves.
By 1860 this number had grown to over 4 million slaves making the U.S. 'the world’s largest and most powerful slave-holding republic.' (Johnson, 2008, p. 1)

The majority of slaves were people of African descent. The justification for slavery was based on the belief of black inferiority. Johnson (2008) states:

The capstone of this racial context of slavery is Whites’ belief in black inferiority. Today, most Americans believe in racial equality even though the daily practice of racial equality leaves an enormous amount to be desired. In the 19th century the belief in black inferiority was virtually universal among Whites, with the exception of abolitionist and some anti-slavery people. Most Whites in both the South and the North had a bone-deep conviction about black inferiority that justified slavery in their eyes. Even Whites who recognized some evils about slavery tended to shrug them off as necessary evils, given the fundamental inferiority of Black people. White racial prejudice served as a kind of Kevlar vest, an ideological protection that shielded slavery from assault, both political and moral. (p. 2)

Slavery directly resulted in the “second-class” classification of African Americans. It ingrained the deeply imbedded belief that African Americans are inferior to Whites. This perception still exists today even though slavery ended over a century ago.

In the early 1950’s, racism was imbedded in everyday society. African Americans were faced with outright discrimination in all areas including education, housing and employment. The United States Supreme Court’s decision in \textit{Brown v. Board of Education (1954)} helped to initiate reform against the segregation that was occurring in
public education. However, although many decades have passed since Brown, racial inequalities still exist in the educational system. The majority of African American students attend schools that have inadequate facilities, funding issues, and inexperienced teachers (Edwards, 2004).

The legislative action, including the Civil Rights Act of 1964 which prohibited discrimination based on race, religion or ethnic background, that resulted from the discrimination against African Americans had the goals of righting past discriminations, opening opportunities regardless of race and ending segregation (Edwards, 2004).

Integration was meant to help African Americans “blend in” with the White population. The idea was that schools, neighborhoods and society in general would be blended, multicultural and equal. Dr. Martin Luther King helped to facilitate this assimilationist ideal. The hope was that African Americans would move their status from “Negros” to “Americans” but unfortunately the negativity against African Americans was more deeply rooted in general than the biases held against other minorities. The assimilationist ideal did not work as it was intended in American society, though individual rights have advanced African Americans are still viewed as “different” and/or inferior (Edwards, 2004).

Brown aimed to force equality by eliminating segregation while Grutter v. Bollinger (2003) wanted to achieve equality by focusing more on diversity. In Grutter v. Bollinger (2003) the Supreme Court ruled that the University of Michigan Law School could factor race into the admissions decision process since diversity had been previously established as a compelling state interest and the Law School’s use of race was merely a
potential factor considered along with other qualifying factors.

Although the intentions of Brown were equality among students in public schools, the reality was a continuation of a curriculum that was focused on the White culture. Schools conformed to the ruling but not in a truly transformative way. Segregation may have ended, but the ruling did not ensure the equality that was desperately needed in order for minorities to excel (Thomas, Chinn, Perkins, & Carter, 1994).

**Assimilation of African Americans and other minorities.** In recent years many African Americans no longer work toward assimilation but choose instead to embrace diversity. They often reject the idea that the minority population must take on the characteristics and beliefs of the majority and instead choose to have a distinctive and unique racial identity (Edwards, 2004).

African American children are directly influenced by cultural inversion especially in the areas of education. They often reject the typical characteristics of the dominant cultures. Hip Hop music that is so popular among these youths arose from the rejection of what was deemed appropriate (Perry, 1995). Fordham & Ogbu (1986) found that many African American high school students purposively avoid acting White. Unfortunately this often means academic underachievement as they sometimes avoid classroom participation, turning in work, and following classroom procedures.

African Americans are not the only minority group that values individual diversity and has therefore chosen to embrace the unique characteristics of its culture. In the past, many ethnic groups that could more easily blend in with the White culture chose to do so. In present times these groups often choose to show their distinctive cultural
characteristics instead of blending in (Edwards, 2004). Whether the issue is race, religion, sexual orientation or the existence of a disability, groups that have been discriminated against in the past now want equality and recognition of their unique perspectives (Edwards, 2004).

Edwards (2004) further explains recognition by stating:

Diversity, understood through the valuing-our-identities approach, has the potential to reinvigorate the ideal of integration. Although the journey from assimilation to diversity has been long, the ideal of integration has not been lost along the way. Between Brown and the present, the valuing-our-identities ethos has reshaped the ideal of integration. It has empowered many African Americans to be who they want to be, without shame or apology. (p. 977)

The election of Barack Obama as President in 2008 has had a profound effect on minorities. Many minorities, especially African Americans, saw this election as vindication for America’s past wrongs of slavery and racial discrimination (Gray, 2008).

Shortly after the election Atlanta Mayor Shirley Franklin stated:

Just a little more than 10 years ago it was inconceivable to any of us that we would see an African American win a national party’s ticket and then compete effectively. It’s mind boggling how much this means about the opportunities available to all people- Asians, Latinos and other people who’ve historically been locked out of the system (Gray, 2008, ¶ 12).

Currently it is unclear what effect, if any, the Obama election & presidency will have on minority students. Professors, teachers and those involved in educational policy
hope that Obama’s success will serve as inspiration to minority students, especially African Americans, and therefore help to improve their achievement in school (Dillon, 2009).

**Mexican immigration.** Immigration from Mexico to the United States has diversified the student population even more. This movement of Mexicans to America began in 1848 as a result of the ending of the Mexican-American War. The Treaty of Guadalupe Hidalgo gave the U.S. part of Mexico’s territory including the states now known as California, Texas, New Mexico and Arizona. Migrant workers began to cross over from Mexico to work for Americans who settled in these new territories (Roberts, Frank & Lozano-Ascencio, 1999).

In the 1970’s immigration from Mexico to America greatly increased due to problems in Mexico with unemployment and low wages. Families have become dependent on the prosperity experienced in America and often use these wages to support family back in Mexico (Roberts, Frank & Lozano-Ascencio, 1999). In 2008 the largest number of Mexican immigrants, 12.7 million, were residing in the U.S. This is 17 times the number of immigrants that came to the U.S. in 1970. Thirty-two percent of all immigrants living in this country are from Mexico. Approximately 55% of these Mexican immigrants are considered illegal. The United States has more Mexican immigrants than the total number of all immigrants residing in any other country (Pew Research Center, 2010).

The Hispanic population, expanding throughout the United States at an astounding rate (Fry, 2007), has forced schools to focus on how cultural issues may be
hindering the new influx of Latino students (Mitchell, 2009). Novak (2005) emphasizes the importance of this expanding population by pointing out that the Latino influence has impacted communities in ways that other immigrant groups have not, especially in the areas of economic and political power.

**Other diversity issues.** Unfortunately there are other issues that have historically hindered the education of diverse students. Gender bias in the classroom has been a political focus since the 1960’s. Both Title VII of the *Civil Rights Act* (1964) and Title IX of the *Education Amendment* (1972) aimed to establish sex equity in schools. No student, whether male or female, should face discrimination based on his or her gender. Schools receiving federal funds must make sure their policies and programs are free of sex discrimination under Title IX. Title IX also encourages students to work towards achieving their desired occupation regardless of whether or not that occupation falls within typical occupations for his or her gender (Bailey, 1993).

It is important to note that race is not the only characteristic that has historically been the object of discrimination. Homosexuality, poverty, and those with disabilities have also experienced harsh discrimination that still is pervasive in today’s society. Students in the same school and educational settings often receive vastly different information regarding their skills and abilities based on race/ethnicity (McCormick, 1994), gender (Grossman & Grossman, 1994), achievement level (Good & Brophy, 1995), and sexual orientation (Savin-Williams, 1990).

Nichols (1999) believes that the discrimination often experienced by diverse students and its adverse effects occur because “(a) schools promote some of these
negative outcomes through the creation of normative climates that are insensitive to
students’ varying needs, and therefore, that (b) schools can and should play a more active
role in helping to prevent negative developmental outcomes.” (p. 505)

**Critical Race Theory, Color Blindness and White Privilege**

Educational opportunities and achievement are limited when teachers do not reflect on how their own racial/cultural backgrounds contrast from those of their students. Many teachers do this by adopting a color or culture “blindness” view towards their students. Lorde (1982) believes that these views are adopted in order to “conquer it [racism and discrimination] by ignoring it” (p. 81). Furthermore, this view can hinder teachers from obtaining the skills necessary to succeed with diverse students, especially those who have historically had the most disadvantage (Milner, 2007A).

Multicultural researcher Banks (2001) explains:

A statement such as ‘I don’t see color’ reveals a privileged position that refuses to legitimize racial identifications that are very important to people of color and that are often used to justify inaction and perpetuation of the status quo. (p. 12)

Racism should not be viewed as atypical or uncommon. Critical race theorists start their investigations by assuming that racism is a normal, deeply imbedded concept in our current society (Lopez, 2003). The terms “American” and “normal” are often associated with being White “both outside and inside the United States” (Jay, 2003, p. 3).

One aspect of critical race theory is that racism and issues regarding race are highly influential, embedded and widespread throughout society. Because it is so common to filter experiences around race, it becomes standard practice. Most individuals
do not typically recognize the symptoms and effects of this hidden racism (Ladson-Billings, 1998). The main goal of critical race theorists is to raise awareness of both racism and bias. By exposing the results of methodical racism they hope to aid in interrupting its practice and alter current procedures, directives, theories and actions (Milner, 2007B).

Ladson-Billings (1994) states:

My own experiences with White teachers, both pre-service and veteran, indicate that many are uncomfortable acknowledging any student differences and particularly racial differences. Thus some teachers make such statements as “I don’t really see color, I just see children” or “I don’t care if they’re red, green, or polka dot, I just treat them all like children.” However, these attempts at colorblindness mask a “dysconcious racism” and “uncritical habit of mind” that justifies inequity and exploitation by accepting the existing order of things as given. This is not to suggest that these teachers are racist in the conventional sense. They do not consciously deprive or punish African American children on the basis of their race, but at the same time they are not unconscious of the ways in which some children are privileged and others are disadvantaged in the classroom. (p. 31-32)

White privilege occurs when White individuals automatically experience all the privileges associated with being White. These privileges just naturally occur, based on a historical precedence (Juarez, Smith & Hayes, 2008). White privilege is a phenomena that has a direct impact on educators. The majority of teachers who are White may have
difficulty relating to students of color. Many do not understand the challenges students and families of color face. “For most White, middle-class educators, their race (skin tone) and ethnicity (historical, geographical origin), is an unearned asset, not a liability” (Burns, Keyes & Kusimo, 2006, p. 14).

**Importance of Middle Level Research**

**Why focus on middle level students?** Middle level students, those in grades 5 through 8, have emerged as a distinctive and unique educational challenge (Breaking Ranks in the Middle, 2006). Caught in between childhood and full adolescence, they are dealing with self-discovery and physical changes at a time when their educational situation has also changed. More demanding schedules, harder schoolwork, increases in both number of teachers and levels of responsibility can all lead to feelings of inadequacy. Feeling overwhelmed and/or disconnected, many middle level students lose motivation and therefore do not put forth the effort necessary for academic success (Eccles, Wigfield, Midgley, Rueman, MacIver, & Feldlaufer, 1993).

Physical development as well as changes in relationships with friends and family combines with educational transitions to effect the manner in which students react to the middle school environment (Wigfield, Byrnes & Eccles, 2006). Emotional and academic decline are the norm during this time (Harter, Whitesall & Kowalski, 1992). Because of the problems associated with this age group, middle school reform has been an important topic for over 20 years (Meece, 2003). Results of this reform have focused on improving the environment of middle schools through varying techniques including increases in counseling programs, block scheduling, and the formation of new programs and teaching practices (Jackson & Davis, 2000).
Not only do the students themselves change during this time, but noticeable changes also occur in the school environment. Middle level schooling has a vastly different environment than that of elementary schools. These schools typically have more students, are more rigid with structure/rules, and are less personal (Eccles & Midgley, 1989). Elementary school tends to be more supportive of their younger students and parents are generally more involved at this level. Also, unlike elementary school teachers, many middle school teachers specialize in a specific subject that they teach to classes ranging in size from approximately 24-33 students. This set up makes it harder for teachers to get to know their students on a personal level. Achievement is also affected due to the short amount of time teachers see each student (Eccles & Midgley, 1989).

Experiencing more structure, different teacher control/discipline, less individual attention, a limited teacher/student relationship and less individual choice can negatively impact students especially in the areas of motivation, achievement and behavior (Midgley, Anderman & Hicks, 1995). These declines in motivation are influenced more by the non-supportive environment of traditional middle school settings rather than by the developmental changes that occur during adolescence (Eccles et al, 1993). In fact, research has shown an increased negativity from grade six to eight in how students feel about school (Haladyna & Thomas, 1979). Compounding these problems are the typically held assumptions that early adolescents are unstable, unmotivated and difficult (Eccles et al, 1993).

Many adolescent students are experiencing academic, social and emotional issues which put them at risk for criminal behavior, depression, suicide and academic failure.
Compounding this problem are the confusing, inconsistent messages that adolescents receive from school and society. Representations of teenagers in the media often encourage youth to emulate what is perceived to be normal, popular behavior. Many adolescents will struggle with feelings and/or the realization that they cannot achieve this example of normalcy (Nichols, 1999). Support often is not available for students facing atypical situations or exhibiting unusual characteristics even though these students are often encouraged by counselors, teachers, parents and the media to be proud of their uniqueness.

Research has shown that a middle school student’s positive feeling of belonging is directly related to achievement in class, beliefs about ability to succeed and overall engagement (Freeman & Anderman, 2002). Negative feelings of belonging are associated with absenteeism and risky behaviors (Nichols, 2003).

Often, a student’s view of school changes upon entering middle school. Many students move from finding school important and interesting to perceptions that are distinctly opposite (Eccles & Midgley, 1989). Middle school teachers, therefore, must work to get and keep students’ attention during a time when other interests may take precedence over academic achievement. Because students often experience a decline in school performance, effort and motivation during middle school years, many researchers feel that these years are critical indicators of how well these students will perform and succeed in later years (Anderman & Maehr, 1994; Eccles & Midgley, 1989).

Fulk, Brigham and Lohman (1998) found that middle level students with learning disabilities often experience more difficulties in school than their regular education
classmates. Many struggle with feelings of isolation from peers and are embarrassed by what they perceive to be their own inadequacies. These perceived inadequacies can result in behavior problems, lack of motivation and even complete disengagement from classroom learning activities. Teacher behavior has the most impact on students with low achievement. Many of these students already have a negative perception of school due to their low achievement and therefore need more encouragement and feedback than their peers. High achieving students are often intrinsically motivated and will continue to excel with or without a positive student-teacher relationship (Midgley, Feldlaufer & Eccles, 1989).

Encouraging relationships with teachers are extremely important at this age. Middle level students are asserting their independence, which often results in spending less time with parents (Collins & Laursen, 2004). Because of this, many middle level students may spend more time around their teachers than with their parents. Problems can occur, according to Lynch and Cicchetti (1997), when students feel that their relationships with their middle school teachers are not as positive as the ones they had with their elementary teachers. This negative perception may develop because students feel they do not receive the individual attention that they had before because classes may now be larger and seem to be filled with interactions that are not as positive or personal. Improving the educational experience for these students is of importance because indicators for the potential to become high school dropouts can be seen as early as middle school (Rumberger, 1995).

Research has shown that middle level students are more likely than elementary
students to have decreased motivation and/or self-esteem, to engage in cheating, and to consider dropping out of school in the future (Murdock, Hale, & Weber, 2001; Rumberger, 1995; Anderman, Maehr, & Midgley, 1999). These issues can often be connected to teacher-student interactions (Haselhuhn, Groen, & Galloway, 2007; Martin, 2008). Fairness in the classroom, treatment received in class by teachers, level of support given at school, and quality of the teacher-student relationship are all-important factors in the overall educational experience of middle level students (Finn & Frone, 2004; Roeser, Eccles, & Sameroff, 1998; Wentzel, 1998; Furrer & Skinner, 2003).

The middle school level is a particularly challenging area to address in regards to the training of pre-service teachers. Most pre-service teachers would rather teach other levels, believing that middle school students are over-emotional and difficult to control (Finders, 1999; Midgley, Feldhauer, & Eccles, 1988). Pre-service teachers also worry about dealing with middle school students’ hyper behavior, impulsiveness and lack of control (Sage, 1989-1990). Perceptions and preconceived ideas regarding middle school students can accelerate in middle school settings causing weaker teacher-student relationships (Midgley et al, 1988).

Pre-service teachers’ beliefs regarding middle school students are often formed from information that has been passed to them through previous educational experiences. Allowing these teachers to work with middle school students and gain their own firsthand knowledge can result in a more positive view toward middle school students and an understanding of teaching methods that are successful at this level (Sage, 1989-1990). In order to improve achievement among middle school students it is important to strengthen...
and improve relationships between teachers and students, provide a stable, supportive environment, strengthen the efficacy beliefs of teachers and provide individual attention to each student’s learning process (Eccles et al, 1993).

**Socioeconomic Issues, Minority Issues and Achievement**

*Socioeconomic issues.* Socioeconomic issues and their effect in the classroom cannot be ignored. Almost 20% of American students age 10-17 live in poverty. Many of these students are considered homeless (Grigg & Donahue, 2007). Research conducted by Tate (1997) revealed that when reviewing the National Assessment of Educational Progress (NAEP) data, SAT and ACT scores “a strong relationship between socioeconomic status and mathematics achievement is evident” (p. 667). He also pointed out that minority students are more likely to experience poverty than White students.

Research has proven that students from higher socioeconomic backgrounds will have higher levels of achievement than students from poor families. Wealthy parents have the opportunity to provide their children with additional learning experiences other than traditional schooling (Bock & Moore, 1986). These resources help these students strengthen and maintain interest in academic achievement (Cooper, 1990).

Another issue affecting disadvantaged students is that pre-service teachers are often exposed to an expansive amount of negative terminology in their coursework when studying diverse populations. Terms such as “disadvantaged,” “at-risk,” “learning disabled” and “the underclass” often combine with the underlying message that “culturally different” students cannot reach the achievement level of their White middle-class peers. Teachers therefore link socioeconomic disadvantage with low school
achievement instead of treating each student as a unique case (Delpit, 1992, p. 245).

Cooper (1990) states:

Regardless of ethnicity, it is commonly assumed there is a cyclical relationship among socioeconomic status, school achievement, educational attainment, and occupational attainment. Socioeconomic status predicts school achievement, which is a strong predictor of educational attainment, which, in turn, is repeatedly shown to be the strongest direct predictor of occupational attainment. Occupational attainment determines socioeconomic status which then, coming full circle, affects school achievement in the next generation (p. 160).

**Minority issues.** Schools often fail their diverse populations by: (a) failing to acknowledge and overcome issues caused by cultural differences. This can lead to the students cultural differences being misread as deficiencies and/or cause problems with the use of effective instructional methods and discipline that do not conflict with the student’s culture; (b) assuming stereotypes are correct; (c) assuming lack of achievement is due to failure of the student rather than failure of teaching methods; (d) failing to educate teachers about community norms which can cause conflict with parents and lead to a messiah complex where schools feel they must protect students from their environments instead of working with communities to achieve goals; (e) failing to include curriculum, instruction and classroom materials that incorporate the history and norms of minority students (Delpit, 1992).

Teachers may unknowingly transmit their feelings regarding a student’s abilities to the student through their teaching methods and classroom actions. Student failure is
typically associated with student ability rather than student motivation. Teachers then resort to teaching methods typically used for low achieving students, such as direct instruction, which only creates a greater disadvantage for minority students (Tatto, 1996).

Nichols (1999), states:

Societal messages about normative culture permeate the lives of adolescents. Schools, as reflections of societal cultures, weave these messages throughout the informal curriculum by way of discipline, rules, and formal curricula. Many school climates foster norms, values, and belief systems that communicate rejection and intolerance to some students. (p. 505)

African Americans experience higher levels of unemployment, low socioeconomic status and incarceration than any other ethnic group. In 2004 the poverty rate for African Americans was 10.2%, twice the rate of Whites. The imprisonment rate of Black men (ages 25-29) was 10.4% as compared to 1.2% of White males in the same age range (Edwards, 2004). Edwards (2004), states:

The causes of the Black underclass are both ‘external’ (the legacy of slavery, segregation, discrimination, poor systems of public education, and failed economic policy) and ‘internal’ (the failure of some African Americans to take needed personal steps to avoid drugs, crime, unplanned pregnancies, and other self-destructive behavior that worsens their plight. (p. 968)

Morgan (1990) conducted a study that suggested African American boys seek out peer interaction more frequently than other students while performing classroom tasks. Morgan therefore concluded that African American boys will achieve more and obtain a
stronger sense of belonging in a classroom setting that allows for increased mobility and communication (Delpit, 1992).

Many discipline problems between students/teachers of different cultural backgrounds are often a result of ingrained beliefs regarding the appropriate levels of directness and control taken in the classroom. In order to be effective, teachers must take into account how students ‘read’ teacher intent. African American boys are most at risk for having negative interactions with their teachers because of their typically higher degree of verbal and physical interaction with peers (Delpit, 1992).

Delpit (1992) explores how cultural misinterpretations can affect students by sharing this example:

Many African American teachers are likely to give directives to a group of unruly students in a direct and explicit fashion, e.g., “I don’t want to hear it. Sit down, be quiet, and finish your work now!” Not only is this directive explicit, but with it the teacher also displays a high degree of personal power in the classroom. By contrast, many middle-class European American teachers are likely to say something like, “Would you like to sit down now and finish your paper?” making use of an indirect command and downplaying the display of power. Partly because the first instance is likely to be more like the statements many African American children hear at home, and partly because the second statement sounds to many of these youngsters like the words of someone who is fearful (and thus less deserving). African American children are more likely to obey the first explicit directive and ignore the second implied directive. (p. 239)
Researchers Skiba, Michael, Nardo, and Peterson (2002) found that African American students “are referred to the office for infractions that are more subjective in interpretation” (p. 317). Teachers may misinterpret the behavior as “completely disrespectful and intolerable,” therefore minority students also suffer harsher consequences when referred to authority figures than do their White counterparts (Milner 2007b, p. 393). Black students continue to face inequity in schools and the problem seems to be escalating. These students are three times more likely today to be suspended for the same action as their White peers. In 1972 they were twice as likely. Black students are subject to less experienced teachers, lower test scores, more referrals for special education and lower graduation rates (Adams, 2008).

Research has shown that African American girls are valued for their caring or nurturing attitudes rather than for their academic achievement. Although many have been given the opportunity to care for younger siblings or relatives, they should be encouraged to reach academic goals instead of just being valued for their helpful nature (Delpit, 1992). Other examples of how culture can impact the classroom can be seen in Latino girls and Native American students. Many Latino girls find it hard to show their academic abilities in front of their male counterparts yet most classrooms continue to be gender mixed. Native American students often have been raised believing it is wrong to speak for others. Asking them “What does the author mean in this passage?” or assigning them the task of summarizing an author’s work can cause difficulties as these students struggle to maintain their cultural beliefs (Delpit, 1992).

Delpit (1992) asserts that Asian American students are often viewed as excellent
students who will excel regardless of classroom environment. This attitude can result in Asian American students not receiving the support and guidance they need. Their quiet demeanor and good behavior also tend to strengthen the high regard most teachers hold for Asian American students. She also maintains that many Native American students are also not very verbal in the classroom. Questions asked of these students may seem inappropriate to them and they also may prefer to express themselves in smaller group settings rather than in front of the whole class. Teachers may try to minimize their discomfort by not calling on them, which only further isolates them (Delpit, 1992).

Walker (1993) states:

Underrepresented groups are compared against a mainstream standard— that is, White, middle-class, and heterosexual. In such a comparison, these groups are seen as deficient. Simultaneously, the tremendous variability within diverse groups is ignored and their strengths are minimized. (p. 343)

Trumbull, Rothstein-Fisch, Greenfield and Quiroz (2001) expand on this problem by examining ways to counteract it:

A broader understanding of the cultural value system in which children grow up is necessary to improve the education of minority students. If school reforms are to close the achievement gap, they must recognize the role of culture in schooling and the relationships between home culture views of child development and those implicit in school practices. (p. 182)

The measuring of minority students' abilities is almost exclusively based on standardized tests that do not accurately or equally determine achievement. The results of
these tests help the gap between social classes grow larger. Research has shown a  
stronger relationship between test scores and socioeconomic status than the relationship  
between test scores and future achievement (Edwards, 2004). The unique diversity seen  
among ethic groups should be recognized and valued for their strengths. They should not  
be compared to those individuals from the mainstream standards. Incorporating class  
materials developed and written by a diverse population can help to ensure a variety of  
work that appeals to all students (Walker, 1993).

Stereotypes regarding the family lives of diverse or minority students are often  
hard to overcome. Typical stereotypes may be that African-Americans don’t have fathers  
present in their households, gays/lesbians do not want or have children and/or families,  
and Asians are typically from highly educated upper-income families (Walker, 1993).  
Minority students are often assigned to lower or remedial coursework in order to obtain  
the normal level of achievement set by their White classmates. It is not taken into account  
that minorities may have life experiences that differ from what is considered “normal”  
and therefore may express knowledge in different ways (Milner, 2007A).

Achievement. Bourdieu, Passeron and Nice’s (1990) cultural reproduction theory  
is based on the assumption that people from the dominant culture have the advantage by  
displaying the prevalent cultural and social norms including language. Bourdieu,  
Passeron and Nice (1990) believed that families pass on cultural and social traits, referred  
to as “cultural capital” and “social capital,” to their children. These traits can advance or  
delay a child’s success in school.

The crossroads where an individual’s beliefs and an institutions cultural policies
meet are defined by Bourdieu and Passeron (1990) as a concept known as habitus. This set of cultural guidelines governs the institution as a whole, but also impact the perceptions and attitudes of each individual within that institution (Lim, 2008).

Individuals take in these institutional guidelines and adapt their own practices to match and/or confirm the existing norm (Lim, 2008). Lim (2008) states, “Individuals who practiced a sense of linguistic preference (e.g., preference of standard English to Black Vernacular English), developed patterns of social /cognitive engagement (e.g., separate/individuated mode of learning), or acquired [personal taste] are often provided as examples of habitus” (p. 83).

Unfortunately, school systems tend to base their institutional habitus on the cultural norms of the predominant societal group and therefore expect all students to display cultural and social traits that affirm the existing practices (Bordieu, Passeron & Nice, 1990). This setup may hinder students who possess cultural and/or social traits different than the norm. Cultural reproduction theory can help schools evaluate their procedures to eliminate policies that may discrimination against any specific group of students (Zevenbergen, Atweh, Forgasz, & Nebres, 2001).

Delpit (1992) sums it up by stating:

If we do not have some knowledge of children’s lives outside of the realms of paper-and-pencil work, and even outside their classroom, then we cannot know their strengths. Not knowing students’ strengths leads to our “teaching down” to children from communities that are culturally different from that of the teachers in the school. Because teachers do not want to tax what they believe to be these
students’ lower abilities, they end up teaching less when, in actuality, these students need more of what school has to offer. (p. 242)

For over 30 years research has shown consistent mathematics achievement gaps between White, middle-class male students and female, minority and lower socioeconomic students (Lee, 2002). One of the perceived causes of the continuing gap in academic achievement is the lack of equity in regards to opportunity. Teachers can help to provide this equity and alleviate racial and/or cultural conflicts by immersing themselves in a climate of multicultural education. Banks & Banks (1993) describe multicultural education as a “total school reform effort designed to increase education equity for a range of cultural, ethnic, and economic groups” (p. 6).

A teacher can adopt a multicultural climate that will result in increased achievement for diverse students if they prepare lessons based on multicultural principles and develop an understanding of their students’ unique characteristics without lowering expectations of their students’ achievement (Tidwell & Thompson, 2008-2009). These teachers must embrace multicultural concepts such as being aware of cultural discrimination, recognizing their own lack of cultural knowledge, avoiding disparaging cultural behavior, not forcing their own cultural values/beliefs on students, understanding the cultural dynamics in their school, and designing culturally relevant work for their students (Tidwell & Thompson, 2008-2009).

Unknowingly, teachers may use poorly constructed teaching methods when trying to incorporate multicultural education. These methods may actually impact diverse students negatively, making the inequities larger. Methods of this type include the
missionary approach (or messiah complex), the minstrel approach, and the tolerance approach (Thomas, Chinn, Perkins, & Carter, 1994). Teachers using the missionary approach believe that they are meant to save students of color from their socioeconomic disadvantage or cultural issues. These teachers do not believe students can gain the skills needed at home since they come from disadvantaged backgrounds. Negative beliefs such as these can result in lower expectations and non-challenging work for these students. These students may not be at risk when they arrive at school, but may become at risk due to teacher expectations (Thomas, Chinn, Perkins, & Carter, 1994).

Teachers using the minstrel approach risk allowing stereotypical ideas to permeate the classroom. These teachers may use outdated, superficial or biased textbooks and images instead of seeking accurate, more positive portrayals of minorities. With the tolerance approach, teachers ignore multicultural issues and students therefore do not learn to value cultural differences (Thomas, Chinn, Perkins & Carter, 1994).

The connection between student and teachers is often as vital as the material that is covered in class. Students are directly impacted by the interactions they have with their teachers. What is said and how it is said can send messages to students about their perceived abilities, future efforts and even their backgrounds. Teachers must strive to “examine, reshape, and diversify their instructional practice and attitudes to eliminate gender, race, or class biases that hinder and inhibit children’s learning” (Kreinberg, 1989, p. 144).

Barr & Parrett (2006) say:

We see ourselves reflected in the people around us. If people look at us as a
loser, we’ll come to believe we are a loser. If a kid has one adult who believes in him, that person can have a transforming quality. If you surround a group of kids with people who believe in them, just imagine what can happen (Adams, 2008, p. 29).

**Achievement in Mathematics**

**Mathematics as indicator for success.** Math is important to a student’s future success because it develops and strengthens vital skills such as understanding special relationships, learning to estimate and approximate values, learning to interpret data, and using problem-solving/reasoning skills (Kreinberg, 1989). Math is also a vital subject for students because of its connection to future jobs. Occupations at just about every level use mathematics based skills. Students should be exposed and encouraged to consider math-based fields. Problem solving, another necessary skill, is embedded in math as students analyze various situations; identify patterns; utilize tables, graphs & diagrams; learn technological tools; and discuss problems and solutions (Kreinberg, 1989).

Brown and Porter (1995) explore the reasons for studying mathematics stating:

Mathematics is about pattern and structure; it is about logical analysis, deduction, [&] calculation within these patterns and structures. When patterns are found, often in widely different areas of science and technology, the mathematics of these patterns can be used to explain and control natural happenings and situations. Mathematics has a pervasive influence on our everyday lives, and contribute to the wealth of the country. (p. 1)

Brown and Porter also explore how math can push students ahead by saying:
Those who qualify in mathematics are in the fortunate position of having a wide range of career choices. The abilities to use logical thought, to formulate a problem in a way, which allows for computation and decision, to make deductions from assumption, to use advanced concepts, are all enhanced by a mathematics degree course. It is for this reason that mathematician are increasingly in demand. With a mathematics degree, you should be able to turn your hand to finance, statistics, engineering, computers, teaching or accountancy with a success not possible to other graduates. (p. 1)

In the 2006 report *The Gateway to Student Success in Mathematics and Science: A Call for Middle School Reform- the Research and Its Implications* prepared for the Microsoft Corporation by the American Institute for Research, contributors Evan, Gray & Olchefske state:

The demands of the American workplace have been changing rapidly and dramatically over the last several decades. Not too long ago, young people could enter the workplace with only limited skills and still be assured of having access to a good job and their share of the American Dream. This reality is quickly fading as our technologically driven society increasingly demands much higher levels of skill and competency from our citizens of the 21st century. (p. 47)

Elementary and secondary students in American classrooms are performing well below the required competency level in both math and science. In 2005 only 30% of 8th grade students scored in the proficient range on the National Assessment of Educational Progress (NAEP) test. In 12th grade, only 17% were performing at the desired level.
(Evan, Gray & Olchefske, 2006). Compared internationally, U. S. students fall below many other countries in math achievement and scores continue to drop as students’ progress through the K-12 school system. Elementary students score above average when compared to their international classmates, middle school students score in the average range and 12\textsuperscript{th} grade students score well below average (Evan, Gray & Olchefske, 2006).

America once led the way in science and engineering graduates. However, only 5\% of bachelor degrees were earned in engineering in the U. S. compared to 20\% in Asia and 33\% in China in 2008. Nearly 3/4 of all Chinese students earn degrees in mathematics, science, and engineering while only 1/3 of American students earned a degree in these fields (National Science Board, 2010). The percentage of minority students receiving science and math degrees is even less. Women account for 23\% of graduate students in the science and engineering field. Only 1 in 4 African American, Hispanic and Native American students who enter these fields actually graduate with a college degree (Evan, Gray & Olchefske, 2006).

Early success in math is an indicator of future success. Research has shown that when students successfully pass Algebra by grade 9, they vastly increase their chances of completing high school and enrolling in and completing college (Evan, Gray & Olchefske, 2006). Adelman (2006) researched the effects of completion of high school math on college graduation. In his study Adelman concluded that successfully completing Algebra by the 9\textsuperscript{th} grade is critical for obtaining a bachelors degree. The findings also revealed that the higher and more intense the level of math and science completed in high school, the greater the student’s odds of completing college.
Evan, Gray & Olchefske (2006) stated:

If we want to dramatically increase the proportion of students graduating from high school with high-level, globally-competitive skills, then we must dramatically increase the number of students who achieve proficiency in Algebra in their middle school or early high school years as a gateway to the advanced high school coursework that is the driver of high school graduation, college readiness and post-secondary completion rates. (p. 24)

**Reform and equity in math.** Oakes and Franke (1999) examined the long held beliefs in America regarding the large gap between student abilities and the widely held idea that these abilities are the most important determinant of future success. These beliefs about student abilities can lead to the inadequate assessment and placement of students in inappropriate groups or courses (Allexsaht-Snider & Hart, 2001). Equity in math basically follows the assumption that all students can benefit from and excel in math regardless of their gender, racial/ethnic background or social standing. It also involves the teachers of these children who must educate themselves on the various social and economic issues that can affect historically disadvantaged students (Apple, 1992). In 2000, the *Principles and Standards for School Mathematics (NCTM)* cited equity as the most important standard for reform: “Excellence in mathematics education requires equity…. Raising expectations for students’ learning, developing effective methods of supporting the learning of mathematics by all students, and providing students and teachers with the resources they need” (p. 12).

The components of equitable math instruction include teachers’ background
knowledge on the subject matter, their level of preparation from teacher training programs, and their ingrained beliefs about teaching diverse students. These factors, along with district structure and classroom procedures, all have an impact on student achievement (Allexsaht-Snider & Hart, 2001). School district dynamics also have a direct impact on math equity. A district’s support, guidance, ability to assess, development of curriculum and provision of resources all factor into a school’s ability to provide equity. District leaders must recognize and understand how negative teacher beliefs regarding class, gender and race can affect math instruction and provide ways for teachers to recognize and address these beliefs (Weissglass, 2000).

Kreinberg (1989) states:

The task for each of us is to challenge the educational system that has resulted in socially unjust outcomes in mathematics classrooms and to examine, reshape, and diversify instructional practice and attitudes to eliminate gender, race, and class biases that hinder and inhibit children’s learning. (p. 145)

According to Love (2002), there are three types of beliefs that can hinder equity in math. These include beliefs about levels of intelligence and how they affect learning, perceptions regarding the abilities of women, minorities and low-income students, and the overall dynamics of mathematics as a subject (Allexsaht-Snider & Hart, 2001). Other problems that can hinder equity in math occur when math is not viewed as a dynamic subject, when teachers believe math ability is ingrained, or when teachers view math achievement as an indicator of superior intelligence. These beliefs do not support the NCTM standards, which address the multifaceted, dynamic nature of math (Love, 2002).
There are two different ways in which a teacher may view mathematical achievement. One view is based on the concept that teachers and schools are the determining factors, the other maintains that student achievement level and family background make the difference in mathematics success. A teacher’s ability to restructure his/her classroom and strengthen student achievement is directly affected by which view he/she adopts. If achievement is believed to be based on the student, teachers may not feel that they can make a difference and therefore will not change their teaching methods (Allexsaht-Snider & Hart, 2001).

There is and has been a proven gap between White students and socioeconomic disadvantaged and/or minority students who typically take higher-level math courses. Data have shown that White students consistently outperform students of color on both standardized tests and college entrance examinations (Tate, 1997). These continuing gaps have resulted in a growing call for reform in mathematics classrooms that will result in higher achievement for all students (Allexsaht-Snider & Hart, 2001).

Although the findings show ways that a child’s reading and math achievement might be improved, according to the child’s particular ethnic and socioeconomic background and not from a general achievement model disregarding ethnicity, the reality is that for the average minority child these factors will make little difference. Poverty, the result of structural inequalities in a stratified society, produces cumulative disadvantages that are impossible for minority children to overcome when attempting to meet the reading and math achievement standards set by a dominant white culture. (Cooper, 1990, p. 181)
Grouping students according to their performance and believed ability was implemented in the past to benefit those students intended for college-preparatory coursework. It was thought to be effective for all students but now has shown to be deficient in both purpose and effect. Ability grouping and/or tracking negatively impacts minority and low-income students by denying them equal access to more challenging coursework (Kreinberg, 1989). Based on research done by Hewson & Kahle (1998), Allexsaht-Snider & Hart (2001) explain how schools can work towards equity by stating:

Equity in mathematics education requires: (a) equitable distribution of resources to schools, students, and teachers, (b) equitable quality of instruction, and (c) equitable outcomes for students. Equity is achieved when differences among sub-groups of students in these three areas are decreasing or disappearing (p. 93).

This level of reform has been a long time coming. In the late 80’s, the *Curriculum and Evaluation Standards for School Mathematics* (NCTM, 1989) introduced the new goal of equity:

The social injustices of past schooling practices can no longer be tolerated. Current statistics indicate that those who study advanced mathematics are most often white males. Women and most minorities study less mathematics and are seriously underrepresented in careers using science and technology… We cannot afford to have the majority of our population mathematically illiterate: Equity has become an economic necessity. (p. 4)

In explaining the formation and purpose of Equals, a program designed to
improve the mathematics experience for female students, Kreinberg (1989) states:

We knew that failure in mathematics began at an early age with the attitudes, values, and expectations that children encountered, and that prevented them from believing they could learn the subject. Teachers needed to be helped in reshaping their instructional practice to eliminate barriers resulting from gender, race, or class bias. They needed to examine both their practice and their materials to create a program in which: cooperation and communication were as important as the mathematical skills and themselves; heterogeneous groups could succeed in mathematics; and alternative assessment was intermingled with instruction. These were factors essential for broader-based equity programs. (p. 127)

Student diversity research and the resulting data can be an important tool for educators, especially in regards to diversity in education. Educational statistics regarding women, minorities and low-income students can be used to determine the best method for instruction. Modifying classroom strategies based on the information learned can lead to a higher level of achievement for all students (Allexsaht-Snider & Hart, 2001).

Murrell (1994) states:

Applying Vygotsky’s (1978) conception of internalization, responsive teachers of mathematics promote opportunities for mathematics discourse to become internalized as mathematics reasoning and performance. In short, the purpose of responsive mathematics teaching is to assist children in the internalization of math talk (discourse) so that it becomes “math thought” (reasoning). As such, responsive mathematics teachers are compelled to attain proficiency in framing
and reframing the dynamics of discourse in their classrooms to meet the needs of
diverse learners. (p. 566)

Middle school and high school students’ beliefs about their mathematical abilities
and the importance of math tend to be more negative than those of students still in
elementary school. It is expected that older students will experience increased negativity
towards math due to the change in classroom dynamics including the decline in the
quality of relationships they have with their teachers (Eccles, et al, 1993). Students may
disengage from their math courses because they receive negative messages from their
families, fellow students, teachers and society that excelling in math is only achievable
for a select group of students (Allexsaht-Snider & Hart, 2001).

**Teaching strategies.** A major issue in U. S. education today is the large number
of disadvantages experienced by African American males in schools and classrooms.
African American males experience higher rates of discipline, suspension and referrals
for special education than do their peers. Part of the problem is the misconceptions held
by most educators regarding the emotional and social development of these students.
Images in the media and lack of proper information in teacher preparation coursework
leaves educators with a lack of understanding regarding Black culture. Murrell (1994)
states:

> Educators are not likely to develop a pedagogical knowledge base of the critical
> aspects of class and culture for non-mainstream minority group learners unless a
> theory is developed that addresses how these students make sense of the
> curriculum in the context of their unique racial, ethnic, cultural, and political
> identities. (p. 568)
To successfully teach African American males, teachers must use instructional methods that focus on planned activity within the classroom. Classroom instruction should incorporate doing rather than just relying on verbal instruction. Research indicates that African American students perform best academically when allowed to work collaboratively, use conversation to aid understanding and engage in hands-on tasks that are culturally relevant to them (Stiff, Cooney & Hirsch, 1990; Boykin, Tyler, & Miller, 2005). Teachers should not only make sure they demonstrate concepts to students, but also make sure students, especially those who have typically been at a disadvantage, have the opportunity to demonstrate their abilities and misunderstanding (Murrell, 1994).

Kreinberg (1989) reminds us:

As long as tests drive the curriculum, and teachers are pressured to teach to the tests, we will not have a mathematics curriculum that is rich and flexible enough to provide access for all students. (p. 141)

Strategies that seem to work best with all students include providing a supportive environment that encourages students to try regardless of outcome, using a teaching method that enables early success yet provides challenging work, and making connections between math and everyday life including the exploration of math-related careers (Kreinberg, 1989). Math teachers who understand the importance of equity will strive to incorporate a problem solving focus rather than emphasizing the importance of always obtaining the right answer. Kreinberg (1989) asserts that these educators understand that although it is important to achieve the correct answer, it is equally as important to boost student confidence in one’s own mathematical abilities by mastering
problem-solving skills and understanding the calculation method that works best for him or her.

Using manipulatives in middle school math classrooms often is overlooked in favor of the standard ‘paper-and-pencil’ method of teaching math. However, manipulatives are an important tool for achieving equity at any grade level. All students gain a better understanding of mathematical concepts when allowed to use concrete objects to solve problems, especially those who have struggled with this subject matter in the past (Kreinberg, 1989).

D’Amato (1993) believes that incorporating cultural aspects into the curriculum is the key to engaging students and boosting mathematical achievement. Feeling connected to the class can affect the level of effort and engagement a student experiences in math. Teachers must investigate and implement methods to help students achieve this connection. (Allexsaht-Snider & Hart, 2001). Using cooperative learning environments, engaging groups of students in projects, and connecting the work to everyday life are examples of methods that help students excel in math (Boaler, 2006).

The National Council of Teachers of Mathematics’ (NCTM, 1989) document *Curriculum and Evaluation Standards for School Mathematics* has become the guiding standard for practices in the math classroom. The document encourages teachers to emphasize mathematical processes such as reasoning and problem solving over accurate calculations. Furthermore, it pushes educators to find methods that instill confidence in students and strengthen the view that math is important (Murrell, 1994).
Qualifications and Preparation of Teachers

Zeichner (1992) expresses his concern that little has changed since 1969 in regards to teacher population and teacher education programs. Race, class, and gender biases are present in both which ultimately can impact the achievement of present and future students. Researchers now believe it is important to examine candidates for teacher education programs in order to identify their perspectives regarding individuals unlike themselves and then question and reform their views regarding diverse students if necessary. Merryfield (2000) states, “Most of today’s teachers have not been prepared to teach for diversity, challenge inequalities or even recognize the effects of globalization in the lives of their students and communities” (p. 429).

In selecting and recruiting future teachers it is important to select those who can successfully teach diverse populations. Haberman (1995) identified seven characteristics of teachers who are successful with minority populations:

(1) Persistence, (2) willingness to work with authority on behalf of children or youth, (3) ability to see practical application of principles and research, (4) willingness to take responsibility for the learning of at-risk children, (5) a professional orientation to teaching, (6) ability to persist within an irrational bureaucracy, and (7) expectation of making mistakes and learning from them. (p. 779-780)

Ultimately, it would be beneficial if teacher education programs could expand their recruiting efforts to include a larger number of minority teachers. Currently,
recruitment efforts have not resulted in significant increases in minority enrollment. These programs instead must attempt to select from the current candidates, applicants who have experienced a variety of work and social experiences involving diverse populations. This selection process would help to limit the time and effort involved in altering negative perspectives (Gomez, 1993).

Many pre-service teachers attend universities and colleges that do not offer multicultural education courses. Students instead are prepared to teach diverse populations through their foundational coursework and student teaching experiences. An effective goal in teacher education would be to emphasize multicultural education and use it to influence preconceived ideas of pre-service students (Shaw, 1997).

To boost achievement and increase equity in their future classrooms, pre-service teachers must learn to examine and value diversity. This can be achieved through multicultural education courses and curriculum, immersion of students in diverse field experiences, and ongoing assessment of progress in achieving cultural competency (Chisholm, 1994). Teacher education programs have the important task of preparing future teachers who can educate all students. To do this, education programs must give guidance/instruction on teaching strategies specific to diverse populations, help pre-service students develop sensitivity to all cultures and acceptance of linguistic diversity.

Studies also suggest that these programs should examine pre-service students’ racial beliefs in order to counteract racism and/or stereotypes (Tettegah, 1996).

Banks (1998A) speaks of the importance of merging multicultural education with teacher education:
An effective teacher education policy for the 21st century must include as a major focus the education of all teachers, including teachers of color, in ways that will help them receive the knowledge, skills, and attitudes needed to work effectively with students from diverse racial, ethnic, and social class groups. (p. 135-136)

To become more effective, teachers must not only recognize the views of their students but also identify and understand their own views. This includes examining racist views or stereotypes that may be hindering them, increasing their knowledge about other cultures and looking at student diversity as a positive classroom characteristic (McAllister & Irvine, 2000).

Although the goal of teacher education programs is to prepare teachers to deal with student diversity, most “equip teachers to teach in idealized White, middle-class communities where children come from heterosexual, two-parent, primarily English-speaking families.” (Juarez, et al., p. 20). Making sure both current and future teachers are prepared to embrace the increasing student diversity and teach social justice is imperative (Gollnick, 1995). Gay (2002) emphasizes that by stating, “Teacher preparation programs must be as culturally responsive to ethnic diversity as K-12 classroom instruction” (p. 114).

**Strategies for Changing Beliefs and Future Suggestions**

To be effective in culturally diverse classrooms educators must believe that all students have the potential to excel. Teachers must therefore vary instruction to meet diverse students’ needs. They must also be willing to evaluate themselves and their
beliefs in order to be better teachers (Grant & Gilette, 2006). Being sensitive to those who are different than oneself is important if educators seek to find common ground on which to communicate. Learning these skills can aid teachers in understanding why students react negatively to certain types of instruction and help educators to develop methods of instruction that work with varied perspectives. Wittmer (1992) emphasizes this by saying, “The need for ‘cognitive’ empathy, that is, knowledge of that person’s culture, or knowing ‘where that person is coming from’ is also extremely important” (p. 3).

To be successful in educating diverse populations, schools can no longer rely on the standard curriculum based on typical White, middle-class expectations. Instead, the backgrounds and experiences of diverse students must be taken into account, especially for students who have experienced academic failure in the past (Kreinberg, 1989). Wittmer (1992) states:

With the make-up of the student body changing so rapidly, school counselors, teachers and administrators realize that they are now required to learn new techniques and skills for understanding, motivating, teaching, and empowering each individual student regardless of race, gender, religion or creed. (p. 1)

To increase effectiveness, teachers should provide students with learning experiences connected to their backgrounds and everyday lives. Students should also be encouraged to recognize and challenge bias situations and practices they may encounter in the future (Thomas, Chinn, Perkins & Carter, 1994).

There are several questions proposed by Love (2002) that educators can ask
themselves to examine their beliefs regarding diversity. These include:

How do racial, class, cultural, and gender bias manifest in school and classroom practices?; how can individuals come to grips with prejudice and its effect on their lives?; and who are our students and how can we better understand and appreciate their cultural backgrounds? (p. 97)

One model for helping teachers to understand and value diversity is the ASK model. ASK stands for Awareness (of oneself and others), Sensitivity (to all students)/Skills (developed by both teachers and students as they work together to understand and value diversity), and Knowledge (of the cultural differences and backgrounds of others). Models such as this can serve as a guide when trying to bridge cultural and/or diversity based gaps (Wittmer, 1992).

Teacher educators need to examine and restructure their curriculum in order to evaluate their students’ preconceived beliefs. They should strive to help students not only become aware of their beliefs but also to formulate new beliefs and/or strengthen existing ones that support diversity. Assessment techniques should also be in place in order to examine if program strategies are effective in deterring/changing harmful assumptions (Pajares, 1993).

Beliefs are impossible to change when an individual is not even aware of their existence. When these beliefs become apparent, the individual must feel compelled by reason to attempt a change. Teacher educators must guide students to recognize and, if necessary, alter their beliefs. This process should be connected to their academic learning and should occur in a gentle, supportive manner throughout the teacher education program (Pajares, 1993).
Gomez (1993) examines the difficulty involved in changing pre-service teachers’ beliefs about those different from themselves. She states:

[Many] have attempted to challenge and change the perspectives about Others of students enrolled in their teacher education courses. They report limited success in their efforts, noting that students often bring to their courses images of the accomplishments, needs, and goals of ‘Others’ that are grounded in ignorance, fear, and/or indifference. (p. 465)

Rokeach (1968) identified three strategies that are beneficial in changing beliefs. First, education students should have the opportunity to engage in activities that directly conflict with their beliefs. This, however, should be done in a careful and positive manner or the existing belief will only be strengthened. Guskey (1989) reinforces this concept by suggesting that a change in beliefs follows a change in one’s behavior. The second strategy identified by Rokeach (1968) involves having a person of significance with conflicting beliefs (someone with stature who believes differently than the student) provide new and substantiated information to the student. Rokeach’s final strategy involves having the teacher educator work with the student to identify inconsistencies in the student’s beliefs. These strategies can help students as they explore and structure a belief system (Pajares, 1993).

Pajares (1993) emphasizes the delicate nature and importance of the task at hand: Even when teacher educators understand the need to challenge students’ beliefs, they often limit their efforts to challenging only those they consider inappropriate. The development of informed scholarship, however, requires that
all educational beliefs undergo challenge, that all survive careful scrutiny and analysis. Challenge alters and destroys but also clarifies and strengthens.

Teacher educators should challenge beliefs not simply to search and destroy but to encourage self-exploration, clarity, consistency, and commitment. (p. 3)

In conclusion, the review of the literature establishes that teacher beliefs about diversity influence a teacher’s perceptions, teaching methods and interactions with students. Middle level math achievement is an important area of study since early success in math is an indicator of future success and many middle school students often lose motivation and begin to decline academically. Further study of these areas could determine ways to influence and/or change teachers negative diversity beliefs therefore improving the educational experiences of diverse students.
CHAPTER III
RESEARCH METHODOLOGY

Introduction

Prior research has indicated that teacher beliefs can negatively affect teacher behavior. Frequently these beliefs include biases regarding race, class and gender, which can ultimately lead to learning, communication and achievement problems in diverse students (Gomez, 1993).

The main purpose of this research was to determine the relationship of both personal and professional teacher diversity belief typologies to student achievement in middle level math classrooms in North Georgia in 2009. This chapter contains a description of the research methodology that was carried out including the research design, population and sample, instrumentation, procedures for data collection and data analysis.

Research Design

The researcher used a non-experimental, causal-comparative design to investigate the attempt to identify a cause and effect relationship between teacher diversity belief typologies and teacher average student mathematics achievement scores (ASMA). The study was non-experimental because, as stated by Gay, Mills & Airasian (2006), a non-experimental design does not allow the researcher the ability to control or manipulate any of the variables. The researcher instead observes, measures and/or records the information obtained from the various groups or variables and attempts to determine a possible causative relationship between two groups or variables. Approval to conduct
research was granted by the UTC Institutional Review Board (IRB) in March of 2009. See Appendix A-5.

This research was field-based with surveys and demographic data collected on full-time math teachers in middle and elementary schools in North Georgia during the 2009-2010 school year. The study attempted to answer the following research questions already presented in the Chapter 1 introduction:

1. What were the personal/professional diversity belief typologies for middle level teachers who teach diverse populations?

2. Was there a significant relationship between teacher diversity belief typologies and teacher demographics (ex. Race/ethnic background, gender, age, years teaching, education level, exposure to diversity training, participation in multicultural training and/or cultural experiences)?

3. Was there a significant relationship between diversity belief typologies and average student mathematics achievement scores (ASMA) of teachers in middle and elementary schools serving diverse populations?

These data were collected using two surveys developed by Pohan & Aguilar (2001), The Personal Beliefs About Diversity Scale (PerBADS) and The Professional Beliefs About Diversity Scale (ProBADS). Teachers were grouped into four possible typologies based on their diversity belief scores. The four typologies were as follows: High Professional/Low Personal (Typology 1), High Professional/ High Personal (Typology 2), Low Professional/Low Personal (Typology 3) and Low Professional/ High Personal (Typology 4).
In the High Professional/Low Personal typology, teachers have a high tolerance for diversity in school settings while experiencing low tolerance for diversity in a personal setting. In the High Professional/High Personal typology, teachers have a high tolerance for diversity in both school settings and personal situations. The Low Professional/ Low personal is comprised of teachers having a low tolerance for diversity in both school settings and personal situations. Teachers in the Low Professional/High Personal category have a low tolerance for diversity in school settings while experiencing a high tolerance for diversity in a personal setting. Each teacher was assigned an ASMA score, determined by averaging the final percentage based math scores of his or her students, and the mean ASMA scores for the four typology groups were compared using Analysis of Variance (ANOVA).

Population and Sample

The participants for this study were selected by purposely sampling nine middle and elementary schools in the North Georgia area. Schools and the participating teachers were chosen based on: (1) granted approval from the superintendent and school principal, (2) location with the schools/districts closest to the researcher being chosen first, and (3) greatest number of math teachers employed with schools with larger numbers being chosen first in order to increase efficiency in reaching an adequate sample size.

The schools selected had diverse student populations. For the purpose of this study, schools were considered diverse if they had a combined minority population of no fewer than 25% of the total school population, had a mixed socio-economic background as determined by having greater than 25% of the total school population receiving free or
reduced lunch, and had at least four different ethnic groups represented in the total school population. Demographics for the school were obtained from school secretaries and/or other school representatives.

Teacher selection was delimited to all 5th, 6th, 7th and 8th grade middle school math teachers teaching within the two districts that had granted research permission. Leveling courses and inclusion classes were not included in the study. Surveys and demographic questionnaire links were sent to potential participants via email. Average math classroom scores were submitted by all participating teachers to determine each teacher’s ASMA scores. Teachers averaged the scores of all students in both their weakest and their strongest classes resulting in the final scores.

All data gathered remained confidential with no identifying information requested from the participants. Teachers were able to submit their information online anonymously using the link provided. No one, including the researcher, had access as to which school districts, teacher or group of students were connected to each survey, demographic sheet or score. The link was sent to 65 teachers with a total of 30 completing the survey. Teacher participation was voluntary.

**Instrumentation**

Two surveys designed to assess teachers’ personal and professional beliefs about diversity, adopted from Pohan & Aguilar (2001), were administered to the selected teachers from each target school. One survey measured diversity beliefs from a more general, personal position. The other survey measured diversity beliefs from a more specific, professional context. The reasoning behind the two-dimensional approach of
assessing both personal and professional beliefs was determined by the realization that a teacher’s personal beliefs on a specific issue could be in conflict with his/her professional beliefs. In order to get an accurate reflection of these beliefs in all relevant contexts, it was imperative to measure both personal and professional beliefs about diversity. Permission to use instruments was obtained from the Dr. Terisita Aguilar in January 2009.

Pohan and Aguilar developed these instruments to: “(a) include a broader approach to diversity than was currently available, (b) address both personal and professional (i.e., educational contexts) beliefs regarding diversity issues, and (c) be rigorous and psychometrically sound” (Pohan & Aguilar, 2001, p. 163). Analysis in each of these areas helps to set apart individuals who have a flexible, more accepting view of diversity issues from those who have issue with or are less tolerant of diversity. The description of each instrument is as follows:

The Personal Beliefs About Diversity Scale (PerBADS) includes 15-items relating to the following diversity issues: (a) race/ethnicity, (b) gender, (c) social class, (d) sexual orientation, (e) disabilities, (f) language and (g) immigration. The 25-item Professional Beliefs About Diversity Scale (ProBADS) consists of items measuring diversity with respect to (a) race/ethnicity, (b) gender, (c) social class, (d) sexual orientation, (e) disabilities, (f) language, and (g) religion. The educational contexts (i.e., practices, resources, or approaches) included on the professional measure are (a) instruction, (b) staffing, (c) segregation/integration, (d) ability tracking, (e) curricular materials, and (f) multicultural versus
monocultural education. (p. 163-164)

The items of the Personal Beliefs About Diversity Scale (PerBADS), which measures diversity beliefs from a more general, personal position (Pohan & Aguilar, 2001), are shown in Appendix A-1. The items of the Professional Beliefs About Diversity Scale (ProBADS), which measures diversity beliefs from specific, professional context (Pohan & Aguilar, 2001), are shown in Appendix A-2.

Both scales were scored using the 5-point Likert format ranging from 1 (strongly disagree) to 5 (strongly agree). This scale results in the possible scoring range of 15-75 on the PerBADS and 25-125 on the ProBADS. Pohan & Aguilar specify that in regards to scoring:

The measures were designed to assess varying levels of acceptance for (or openness to) a range of diversity issues/topics. Low scores reflected general intolerance for diversity, whereas high scores reflect an openness or acceptance of most or all of the diversity issues. Midrange scores reflected a general tolerance or acceptance of some issues/topics and perhaps a degree of indifference for (or uncertainty toward) some of the issues/topics included in the measure. Midrange scores also indicated high acceptance of some issues/topics and low acceptance or tolerance for other issues/topics, resulting in a seemingly balanced (or midrange) score. (p. 166)

Pohan and Aguilar report that to initially measure content validity the instruments were examined by two multicultural education professors and one social psychology professor, all with at least four years teaching experience. Criteria for reviewing the
instruments included determining if all items were included in one of the specified personal or professional areas of the scale, were easily understood and unmistakable, and were complete in measuring the intended range of issues. Five graduate education students with experience in multicultural coursework also examined the instruments. These students completed the survey paying special attention to the ease of instructions and clarity of items. These students then provided feedback and suggestions for improvement. These initial examinations from both of these groups resulted in some minor changes regarding the wording of some survey items (Pohan & Aguilar, 2001).

To further validate the instruments, the developers used pilot, preliminary, and field testing procedures. In the pilot stages, two samples, equaling 280 undergraduate education students, participated voluntarily with the focus being question clarity, scale reliability and procedural issues. Cronbach’s alpha was used to assess both scales. Alpha coefficients for the personal beliefs scale were .77 for sample 1 and .74 for sample 2. Alpha coefficients for the professional beliefs scale were .86 for sample 1 and .87 for sample 2. The alpha coefficients for both scales indicated reliability, but several minor revisions were made “based on the item-total correlation data and frequency distributions, and with the goal of maximizing scale reliability” (Pohan & Aguilar, 2001, p. 167).

In further preliminary testing, 187 subjects were used to further test for item reliability and instrument validity. This included 92 undergraduate students, 25 graduate students and 70 teachers. These subjects were given a demographic sheet and completed the Multicultural Education Knowledge Test (Aguilar, 1993). Cronbach’s alpha was .95 for the knowledge test. Cronbach’s alpha for the personal beliefs scale and professional
diversity scale was .81 and .89 respectively. This range shows an acceptable level of reliability for both instruments. ANOVA’s were used to determine whether scores on The Personal and Professional Beliefs About Diversity Scales had a relationship to number of multicultural courses, experience, age and gender. It was determined that such a relationship did indeed exist (Pohan & Aguilar, 2001).

The final stage of review occurred with two rounds of field testing. The first round included 756 pre-service and practicing teachers. The second round included 539 subjects also drawn from pre-service and practicing teachers. Item reliability was once again the focus, along with response biases. Alpha coefficients for the personal beliefs scale in the first round of testing were .80 for both pre-service and practicing teachers. The alpha coefficients for the professional beliefs scale were .82 for pre-service teachers and .77 for practicing teachers. Revisions were made to both scales after the first round. In the second round, Cronbach alpha coefficients ranged from .64 to .81 for the personal beliefs scale and .74 to .83 for the professional beliefs scale. This acceptable range further strengthened and supported internal consistency and reliability (Pohan & Aguilar, 2001).

Response biases were also examined through reverse sequencing of personal and professional beliefs scales and the administering of the Crowne-Marlowe Social Desirability Scale (Strahan & Gerbasi, 1972). The reverse sequencing was given to 243 pre-service and practicing teachers in various order. For analysis, t tests were utilized to determine if the given order of scales impacted the results. This test suggested that scores were not influenced by the order in which the scales are given. The Crowne-Marlowe
Social Desirability Scale was administered to 538 pre-service and practicing teachers. Alphas for pre-service teachers and practicing teachers were .62 and .64 respectively. This is in the acceptable range for attitudinal measures (Pohan & Aguilar, 2001).

Conclusions after this extensive examination were that both the personal and professional scales measure what the developers originally intended them to measure. Although broad, it was determined that the scales measure beliefs about diversity with each one measuring unique beliefs of a more personal or professional nature thus supporting the validity of their use in diversity and teacher belief research (Pohan & Aguilar, 2001).

**Research Questions and Related Null Hypotheses**

The study encompassed three main aspects: (a) classification of professional/personal diversity belief typologies of teachers, (b) examination of the relationship between teacher diversity belief typologies and specific teacher demographics, and (c) determination of any relationship between teacher belief typologies and teacher ASMA (average student mathematics achievement) scores. The corresponding three general research questions were:

1. What are the personal/professional diversity belief typologies for middle level math teachers who teach diverse populations?

2. Is there a significant relationship between teacher diversity belief typologies and teacher demographics (ex. race, gender, years teaching, education level, exposure to diversity, participation in multicultural coursework and/or cultural experiences)?
3. Is there a significant relationship between diversity belief typologies and average student mathematics achievement scores (ASMA) of teachers in middle and elementary schools serving diverse populations?

The following related null hypotheses were tested:

Null Hypothesis 1: There is no relationship between race, gender, years teaching, education level and exposure to diversity or multicultural training and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2008.

Null Hypothesis 2: There is no relationship of teacher diversity belief typologies to average student mathematics achievement scores (ASMA) of middle level math teachers in the diverse schools of North Georgia in 2008.

The Variables

The independent variable of teacher belief typologies was determined using the Personal Beliefs About Diversity Scale (PerBADS) and the Professional Beliefs About Diversity Scale (ProBADS). Table 1 shows how the other independent variables: race, gender, age, years teaching, education level, and exposure to diversity/multicultural training were determined. See Appendix A-4. The dependent variable, the average student mathematics achievement scores (ASMA), was determined by averaging the final percentage based score of all students and assigning that score to the corresponding teacher.

Procedure for Data Collection

To obtain district permission to do this study, the researcher contacted each
district office for the required procedure for research requests. Each district policy varied, but in general the procedure was to: contact appropriate representative, submit request to do research within district, give a brief overview of the study, and answer any clarifying questions. The researcher then met with the superintendent, conversed through email or waited for committee approval/feedback. Once district approval was granted the researcher contacted each principal within the district to seek approval to send an email to all middle level math teachers in their school.

An email was sent to all middle level math teacher in middle and elementary schools in the two districts that granted permission for the research. The email included an introduction thanking the participants, explaining the study, and explaining instructions on how to fill out the surveys. Links were provided to the Professional Beliefs About Diversity Survey (ProBADS), the Personal Beliefs About Diversity Survey (PerBADS), and the demographic/teacher background survey. Teachers were asked to submit their online surveys and student grades within 14 days of receiving the email. A brief follow up email was sent approximately 2 weeks following the original email. No incentives were given for teacher participation.

**Data Analysis**

The scores from the Beliefs About Diversity Scales were used to develop four typologies. Cut-off points were determined that divided the scores in the two scales as low or high on personal and professional beliefs. The four typologies described in the Conceptual Framework in Chapter 1 were based on four possible outcomes of scores as shown in Figure 2.
As shown in Figure 2, low and high scores of both personal and professional beliefs were grouped into the four possible outcomes of high professional/low personal (Typology 1), high professional/high personal (Typology 2), low professional/low personal (Typology 3) and low professional/high personal (Typology 4). Teachers were assigned to a typology group based on their scores from the PerBADS and ProBADS.

Average student achievement scores from the current school year were obtained from the participating teachers at each school along with a general description of the teacher’s demographics. These student scores were averaged to determine the teacher’s ASMA score showing both the highest and lowest class percentages. The ASMA score was compared to the respective teacher belief typology. Determined relationship between typologies and ASMA scores were explored through one-way ANOVA. The data was analyzed using SPSS statistical software.
CHAPTER IV

ANALYSIS OF THE DATA

Introduction

A non-experimental, causal-comparative study was conducted to identify the relationship between teacher diversity belief typologies and teacher average student mathematics achievement scores (ASMA) in selected North Georgia middle and elementary schools during the 2009-2010 school year. Teacher diversity belief typologies were developed for classification and comparative purposes.

The population for the study included middle level math teachers in grades 5-8. Only schools that fit the defined status of ‘diverse’ were asked to participate. For this study, a diverse school is defined as having a combined minority population greater than 25% of total population, a mixed socio-economic background specified by 25% of population or greater receiving free or reduced lunch, and a representation of at least four different ethnic groups in the total school population.

The surveys were sent to 65 math teachers teaching 5th through 8th grades. The participants of this study were limited due to the small number of middle level math teachers per school and the difficulty encountered in receiving district approval. Many of the districts asked to participate in the study declined research approval due to the nature of the study. Several of the district representatives stated that the district was either uncomfortable with the study and/or perceived the survey to be “inappropriate.”
survey included questions on sensitive topics that could cause a hesitancy to answer and/or deter those who are not research oriented.

Two instruments were used in the classification of teacher diversity typologies, The Personal Beliefs About Diversity Scale (PerBADS) and The Professional Beliefs About Diversity Scale (ProBADS). Teacher ASMA scores were determined by averaging the final percentage based score of both the highest achieving and lowest achieving classes.

The relationship between teacher diversity belief typologies and teacher demographics (ex. Race/ethnic background, gender, years teaching, education level, exposure to diversity, participation in multicultural coursework and/or cultural experiences) was tested using chi-square. Many of the categories resulting from the chi-square have small numbers due to the small population of the study. The null hypotheses were retained and/or could not be tested due to the limited sample size, with the only exception being the factor of having a gay/lesbian personal friend. Although most of the results were found not to be significant, several trends were observed in this study.

Chapter 4 presents the demographic characteristics of the sample, the non-demographic variables of the sample, development of teacher diversity typologies, the statistical analysis and testing of the null hypotheses.

**Characteristics of the Demographic Variables**

Participants for the study were obtained by purposively sampling nine middle/elementary schools in the North Georgia area. Survey links were sent to approximately 65 math teachers in grades 5-8. A total of 30 teachers participated in the study.
Tables 2-7 show the demographic characteristics of the teachers who participated in the study. Variables include gender, ethnic background, years of teaching, grade level taught, socioeconomic level, and educational level completed.

**Gender**

Approximately three-fourths of the participants were female teachers (79.3%) in comparison to male teachers (20.7%). One participant declined to specify gender. See Table 2.

Table 2

*Gender of Participants*

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>23</td>
<td>79.3</td>
</tr>
<tr>
<td>Male</td>
<td>6</td>
<td>20.7</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Ethnic Background**

The majority of the participants were White (86.7%), with only 13.3% of the participants identifying themselves as Black. No other ethnic backgrounds were represented in the study. See Table 3.
Table 3

*Ethnic Background of Participants*

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>White</td>
<td>26</td>
<td>86.7</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Years of Teaching**

The majority of the population had taught less than 10 years with 33.3% having taught 1-5 years and 26.7% having taught 6-10 years. Approximately five percent of participants had taught for 11-15 years (6.7%) with a slightly higher percentage of approximately 10% teaching in the 16-20 years, 21-25 years and over 30 years categories (9.1%) respectively. Only approximately 3% of the participants had taught in the 26-30 year range (3.3%). See Table 4.
Table 4

Participants Years of Teaching

<table>
<thead>
<tr>
<th>Years of Teaching</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- 5</td>
<td>10</td>
<td>33.3</td>
</tr>
<tr>
<td>6- 10</td>
<td>8</td>
<td>24.2</td>
</tr>
<tr>
<td>11- 15</td>
<td>2</td>
<td>6.1</td>
</tr>
<tr>
<td>16- 20</td>
<td>3</td>
<td>9.1</td>
</tr>
<tr>
<td>21- 25</td>
<td>3</td>
<td>9.1</td>
</tr>
<tr>
<td>26- 30</td>
<td>1</td>
<td>3.0</td>
</tr>
<tr>
<td>Over 30</td>
<td>3</td>
<td>9.1</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Grade Level Taught

Approximately one-third of the participants taught 5th grade (36.7%). The second largest group of participants taught 8th grade (26.7%). The rest of the participants were split almost evenly between 6th grade (20.0%) and 7th grade (16.7%). See Table 5.
Table 5

*Grade Level Taught*

<table>
<thead>
<tr>
<th>Grade Level Taught</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>5th grade</td>
<td>11</td>
<td>36.7</td>
</tr>
<tr>
<td>6th grade</td>
<td>6</td>
<td>20.0</td>
</tr>
<tr>
<td>7th grade</td>
<td>5</td>
<td>16.7</td>
</tr>
<tr>
<td>8th grade</td>
<td>8</td>
<td>26.7</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Socioeconomic Background

Table 6 shows the distribution of the participants based on their childhood socioeconomic background. The highest percentage constituted a middle class background (53.3%), followed by a working class background (26.7%). Approximately fifteen percent of the participants came from upper class (16.7%), with less than five percent coming from poor/lower class (3.3%) backgrounds. See Table 6.
Table 6

*Socioeconomic Background*

<table>
<thead>
<tr>
<th>Socioeconomic Background</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor/Lower</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Working</td>
<td>8</td>
<td>26.7</td>
</tr>
<tr>
<td>Middle</td>
<td>16</td>
<td>53.3</td>
</tr>
<tr>
<td>Upper Middle</td>
<td>5</td>
<td>16.7</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Education Level*

Two-thirds of the participants had obtained undergraduate (33.3%) or masters level (33.3%) degrees. The next largest category consists of specialist degrees (26.7%) with the smallest category belonging to teachers with a doctorate degree (6.7%). See Table 7.
### Table 7

*Education Level*

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>10</td>
</tr>
<tr>
<td>Masters</td>
<td>10</td>
</tr>
<tr>
<td>Specialist</td>
<td>8</td>
</tr>
<tr>
<td>Doctorate</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
</tr>
</tbody>
</table>

**Teacher Diversity Belief Typologies**

**Development and Classification Criteria**

A two-dimensional approach developed by Pohan and Aguilar (2001) was used to develop the teacher diversity belief typologies. Both personal and professional diversity beliefs were examined using The Personal Beliefs About Diversity Scale (PerBADS) and The Professional Beliefs About Diversity Scale (ProBADS) respectively. The teacher diversity belief typology model in Figure 2 was used by the researcher to categorize the responses on the PerBADS and ProBADS.
Figure 2: Teacher Diversity Belief Typologies

<table>
<thead>
<tr>
<th>Personal Beliefs</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typology 1</td>
<td>Low Personal</td>
<td>High Professional</td>
</tr>
<tr>
<td>Typology 2</td>
<td>High Personal</td>
<td>High Professional</td>
</tr>
<tr>
<td>Typology 3</td>
<td>Low Personal</td>
<td>Low Professional</td>
</tr>
<tr>
<td>Typology 4</td>
<td>High Personal</td>
<td>Low Professional</td>
</tr>
</tbody>
</table>

Figure 2. Teacher diversity belief typologies based on scores from the Personal Beliefs About Diversity Scale and the Professional Beliefs About Diversity Scale.

Cutoff points for each typology was determined using guidelines set by the developers. The median score was used as the divide between high and low scores. For the PerBADS, scores were considered low if they fell between the lowest score of 65 and the median score of 84. Scores on the PerBADS were considered high if they fell between 85 and the highest score of 108. For the ProBADS, scores were considered low if they fell between the lowest score of 39 and the median score of 53. Scores on the ProBADS were considered high if they fell between 54 and the highest score of 67. The four possible outcomes were high professional/low personal (Typology 1), high professional/high personal (Typology 2), low professional/low personal (Typology 3) and low professional/high personal (Typology 4).

Research Questions and Related Hypotheses

Research Question 1

Research Question 1: What are the personal/professional diversity belief
Research Question 1 was answered using the teacher diversity belief model developed by the researcher (Figure 2). Scores on the PerBADS/ProBADS were combined, analyzed and categorized according to specified cutoff points. The following teacher belief typologies were developed:

Typology 1 (high professional/low personal): Teachers in this category have a high tolerance for diversity in school settings while experiencing low tolerance for diversity in a personal setting.

Typology 2 (high professional/high personal): Teachers in this category have a high tolerance for diversity in both school settings and personal situations.

Typology 3 (low professional/low personal): Teachers in this category have a low tolerance for diversity in both school settings and personal situations.

Typology 4 (low professional/high personal): Teachers in this category have a low tolerance for diversity in school settings while experiencing a high tolerance for diversity in a personal setting.

Results showed that the largest group belonged to high professional/high personal scorers in Typology 2 (39.4%) followed by the low professional/low personal scorers in Typology 3 (30.3%). Only 12.5% scored in the high professional/low personal range of Typology 1, with the lowest percentage (9.1%) scoring in the low professional/high personal range of Typology 4. See Table 8.
Table 8

Participants by Teacher Diversity Belief Typologies

<table>
<thead>
<tr>
<th>Typology</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typology 1 (HiPro/LowPer)</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>Typology 2 (HiPro/HiPer)</td>
<td>13</td>
<td>43.3</td>
</tr>
<tr>
<td>Typology 3 (LowPro/LowPer)</td>
<td>10</td>
<td>33.3</td>
</tr>
<tr>
<td>Typology 4 (LowPro/HiPer)</td>
<td>3</td>
<td>10.0</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Research Question 2

Research Question 2: Is there a significant relationship between teacher diversity belief typologies and teacher demographics (ex. race/ethnic background, gender, years teaching, education level, exposure to diversity, participation in multicultural coursework and/or cultural experiences)?

Null hypotheses 1a-1q were tested using chi-square with $p = .05$. For each null hypothesis tested, the decision of the test is followed by the corresponding statistics and a summary table of the results.

Ethnic background by teaching typology. Null Hypothesis 1a: There is no relationship between race/ethnic background and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

The null hypothesis was retained ($\chi^2 = 6.036$, df = 3, $P = .110$). Therefore, there
was no significant relationship between race/ethnic background and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010. See Table 9.

Table 9

Contingency Table of Ethnic Background by Teacher Diversity Belief Typology

<table>
<thead>
<tr>
<th>Ethnic Background</th>
<th>Typology 1</th>
<th>Typology 2</th>
<th>Typology 3</th>
<th>Typology 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>% of score total</td>
<td>f</td>
<td>% of score total</td>
</tr>
<tr>
<td>Black</td>
<td>0</td>
<td>0.0</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>White</td>
<td>4</td>
<td>13.3</td>
<td>9</td>
<td>30.0</td>
</tr>
</tbody>
</table>

In the area of race/ethnic background by teacher diversity belief typology only two racial backgrounds, Black and White respectively, were represented in the study. The vast majority (86.7%) of the participants were White. Of the Black participants in the study, 100% fell in the most desirable category of Typology 2 (high professional/high personal). In contrast, only 1/3 of White teachers fell under Typology 2.

Gender by teaching typology. Null Hypothesis 1b: There is no relationship between gender and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

The null hypothesis was retained ($\chi^2 = 5.261, \ df = 3, \ P = .154$). Therefore, there was no significant relationship between gender and teacher diversity belief typologies of middle level math teachers in diverse schools of North Georgia in 2009-2010. See Table 10.
Table 10

**Contingency Table of Gender by Teacher Diversity Belief Typology**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Typology 1</th>
<th></th>
<th>Typology 2</th>
<th></th>
<th>Typology 3</th>
<th></th>
<th>Typology 4</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of</td>
<td>% of</td>
<td>% of</td>
<td>% of</td>
<td>% of</td>
<td>% of</td>
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<tr>
<td>Female</td>
<td>3</td>
<td>10.3</td>
<td>12</td>
<td>41.4</td>
<td>7</td>
<td>24.1</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Male</td>
<td>1</td>
<td>3.4</td>
<td>1</td>
<td>3.4</td>
<td>2</td>
<td>6.9</td>
<td>2</td>
<td>6.9</td>
</tr>
</tbody>
</table>

In the area of gender by teacher diversity belief typology more than 50% of the female participants belonged to Typology 2 as compared to only 16% of males. Of the male participants 1/3 belonged to Typology 3 (low professional/low personal) with 1/3 belonging to Typology 4 (low professional/low personal).

**Years of teaching by teaching typology.** Null Hypothesis 1c: There is no relationship between years of teaching and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

The null hypothesis was retained ($\chi^2 = 11.407$, df = 18, $P = .876$). Therefore, there was no significant relationship between years of teaching and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010. See Table 11.
Table 11

Contingency Table of Years of Teaching by Teacher Diversity Belief Typology

<table>
<thead>
<tr>
<th>Years of Teaching</th>
<th>Typology 1</th>
<th>Typology 2</th>
<th>Typology 3</th>
<th>Typology 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>% of score total</td>
<td>f</td>
<td>% of score total</td>
</tr>
<tr>
<td>1-5</td>
<td>2</td>
<td>6.7</td>
<td>3</td>
<td>10.0</td>
</tr>
<tr>
<td>6-10</td>
<td>1</td>
<td>3.3</td>
<td>3</td>
<td>10.0</td>
</tr>
<tr>
<td>11+</td>
<td>1</td>
<td>3.3</td>
<td>5</td>
<td>10.3</td>
</tr>
</tbody>
</table>

In the area of years teaching by teacher diversity belief typology approximately 1/3 of the teachers who had taught 1-5 years and 1/3 of teachers who had taught 6-10 years belonged to Typology 2. In contrast, 2/3 of teachers who had taught 11-30+ years were in Typology 2.

**Education level by teaching typology.** Null Hypothesis 1d: There is no relationship between education level and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

The null hypothesis was retained ($\chi^2 = 8.000$, df = 9, $P = .534$). Therefore, there was no significant relationship between education level and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010. See Table 12.
Table 12

Contingency Table of Education Level by Teacher Diversity Belief Typology

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Typology 1</th>
<th>Typology 2</th>
<th>Typology 3</th>
<th>Typology 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of score total</td>
<td>% of score total</td>
<td>% of score total</td>
<td>% of score total</td>
</tr>
<tr>
<td>Undergrad</td>
<td>2 6.7</td>
<td>3 10.0</td>
<td>4 13.3</td>
<td>1 3.3</td>
</tr>
<tr>
<td>Masters</td>
<td>2 6.7</td>
<td>4 13.3</td>
<td>2 6.7</td>
<td>2 6.7</td>
</tr>
<tr>
<td>Spec (EdS)</td>
<td>0 0.0</td>
<td>4 13.3</td>
<td>4 13.3</td>
<td>0 0.0</td>
</tr>
<tr>
<td>EdD/PhD</td>
<td>0 0.0</td>
<td>2 6.7</td>
<td>0 0.0</td>
<td>0 0.0</td>
</tr>
</tbody>
</table>

In the area of education level by teacher diversity belief typology of those with only a undergraduate degree, the largest group (40%) belonged to Typology 3 (low professional/low personal). The largest group of those holding masters degrees (40%) belonged to Typology 2, while teachers with specialist degrees were split 50/50 between Typology 2 and Typology 3. Of teachers with doctorate degrees, 100% belonged to Typology 2.

**Socioeconomic background by teaching typology.** Null Hypothesis 1e: There is no relationship between socioeconomic background and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

The null hypothesis was retained ($\chi^2 = 12.963, \text{ df} = 9, \text{ P} = .164$). Therefore, there was no significant relationship between socio-economic background and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010. See Table 13.
Table 13

Contingency Table of Socioeconomic Background by Teaching Diversity Belief Typology

<table>
<thead>
<tr>
<th>SocioEcon Background</th>
<th>Typology 1</th>
<th>Typology 2</th>
<th>Typology 3</th>
<th>Typology 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of score total</td>
<td>% of score total</td>
<td>% of score total</td>
<td>% of score total</td>
</tr>
<tr>
<td>Poor/Lower</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Work Class</td>
<td>1</td>
<td>6</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Middle Class</td>
<td>3</td>
<td>3</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Upper Class</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

In looking at socioeconomic background by teacher diversity belief typology 100% of teachers from poor/lower class backgrounds, 75% of teachers with working class backgrounds and 60% of teachers with upper class backgrounds belonged to Typology 2. In contrast, only 18% of teachers from middle class backgrounds belonged to Typology 2 even though they represented the largest group of participants (53.3%). The largest group of teachers from middle class backgrounds were found in Typology 3.

**No Exposure by teaching typology.** Null Hypothesis 1f: There is no relationship between level of exposure to gay/lesbian individuals and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

The null hypothesis was retained ($\chi^2 = 6.724$, df = 3, P = .081). Therefore, there was no significant relationship between having no exposure to gay/lesbian individuals and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010. See Table 14.
Table 14

*Contingency Table of No Exposure by Teacher Diversity Belief Typology*

<table>
<thead>
<tr>
<th>No Exposure</th>
<th>Typology 1</th>
<th></th>
<th>Typology 2</th>
<th></th>
<th>Typology 3</th>
<th></th>
<th>Typology 4</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of</td>
<td>% of</td>
<td>% of</td>
<td>% of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>score total</td>
<td>score total</td>
<td>score total</td>
<td>score total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>10.0</td>
<td>13</td>
<td>43.3</td>
<td>10</td>
<td>33.3</td>
<td>3</td>
<td>10.0</td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>3.3</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>2</td>
<td>0.0</td>
</tr>
</tbody>
</table>

The testing of no exposure by teacher diversity belief typology found that 100% of teachers who stated that they had not had any exposure to gay/lesbian individuals belonged to Typology 1 (high professional/low personal).

**Gay/lesbian personal friend(s) by teaching typology.** Null Hypothesis 1g:

There is no relationship between having a personal friend who is gay/lesbian and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

The null hypothesis was rejected ($\chi^2 = 13.376$, df = 3, $P = .004$). Therefore, there was a significant relationship between having a personal friend who is gay/lesbian and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

The results revealed that teachers who had gay/lesbian personal friend(s) scored higher on the diversity scales and therefore belonged significantly to Typology 2 (High Professional/High Personal). Of the 60% of teachers who answered ‘yes’ to having Gay/Lesbian friend(s), 40% scored in the High Professional/High Personal typology. In
contrast, of the 40% of teachers who answered ‘no’ to having gay/lesbian personal
friend(s), only 3.3% scored in the High Professional/High Personal typology. See Table
15.

Table 15

*Contingency Table of Gay/Lesbian Personal Friend(s) by Teacher Diversity Belief Typology*

<table>
<thead>
<tr>
<th>Gay/Lesbian Friend</th>
<th>Typology 1</th>
<th>Typology 2</th>
<th>Typology 3</th>
<th>Typology 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>% of score total</td>
<td>f</td>
<td>% of score total</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>13.3</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
<td>0.0</td>
<td>12</td>
<td>40.0</td>
</tr>
</tbody>
</table>

Of the 60% of teachers who answered ‘yes’ to having Gay/Lesbian friend(s), 40%
scored in the High Professional/High Personal typology. In contrast, of the 40% of
teachers who answered ‘no’ to having gay/lesbian personal friend(s), only 3.3% scored in
the High Professional/High Personal typology.

**Gay/lesbian relative(s) by teaching typology.** Null Hypothesis 1h: There is no
relationship between having Gay/Lesbian relative(s) and teacher diversity belief
typologies of middle level math teachers in the diverse schools of North Georgia in 2009-
2010.

The null hypothesis was retained ($\chi^2 = 1.410$, df = 3, $P = .703$). Therefore, there
was no significant relationship between having gay/lesbian relative(s) and teacher
diversity belief typologies of middle level math teachers in the diverse schools of North
Georgia in 2009-2010. See Table 16.
Table 16

Contingency *Table of Gay/Lesbian Relative(s) by Teacher Diversity Belief Typology*

<table>
<thead>
<tr>
<th>Gay/Lesbian Relative</th>
<th>Typology 1</th>
<th></th>
<th>Typology 2</th>
<th></th>
<th>Typology 3</th>
<th></th>
<th>Typology 4</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of</td>
<td>% of</td>
<td>% of</td>
<td>% of</td>
<td>% of</td>
<td>% of</td>
<td>% of</td>
<td>% of</td>
</tr>
<tr>
<td></td>
<td>score total</td>
<td>score total</td>
<td>score total</td>
<td>score total</td>
<td>score total</td>
<td>score total</td>
<td>score total</td>
<td>score total</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>13.3</td>
<td>10</td>
<td>33.3</td>
<td>8</td>
<td>26.7</td>
<td>2</td>
<td>6.7</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
<td>0.0</td>
<td>3</td>
<td>10.0</td>
<td>2</td>
<td>6.7</td>
<td>1</td>
<td>3.3</td>
</tr>
</tbody>
</table>

In the area of gay/lesbian relative(s) by teacher diversity belief typology it was shown that 50% of teachers who stated they had gay/lesbian relatives belonged to Typology 2 while a slightly lower percentage (41%) of teachers who stated they did not have gay/lesbian relatives belonged to Typology 2.

**Gay/lesbian professional contact(s) by teaching typology.** Null Hypothesis 1i: There is no relationship between having gay/lesbian professional contact(s) and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

The null hypothesis was retained ($\chi^2 = 5.421$, df = 3, P = .143). Therefore, there was no significant relationship between having gay/lesbian professional contact(s) and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010. See Table 17.
Table 17

*Contingency Table of Gay/Lesbian Professional Contact(s) by Teacher Diversity Belief Typology*

<table>
<thead>
<tr>
<th>Gay/Lesbian Professional Contacts</th>
<th>Typology 1</th>
<th>Typology 2</th>
<th>Typology 3</th>
<th>Typology 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of score total</td>
<td>% of score total</td>
<td>% of score total</td>
<td>% of score total</td>
</tr>
<tr>
<td>No</td>
<td>2  6.7</td>
<td>3  10.0</td>
<td>6  20.0</td>
<td>0  3.3</td>
</tr>
<tr>
<td>Yes</td>
<td>2  6.7</td>
<td>10 33.3</td>
<td>4  13.3</td>
<td>3  10.0</td>
</tr>
</tbody>
</table>

The results of gay/lesbian professional contact(s) by teacher diversity belief typology show that 52% of teachers who answered yes to having gay/lesbian professional contacts belonged to Typology 2 as compared to 27% of teachers who answered ‘no’ to having gay/lesbian professional contacts. The largest group of teachers (54%) who did not have gay/lesbian professional contacts belonged to Typology 3.

**Gay/lesbian neighbor(s) by teaching typology.** Null Hypothesis 1j: There is no relationship between having gay/lesbian neighbor(s) and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

The null hypothesis was retained ($\chi^2 = 4.451$, df = 3, P = .217). Therefore, there is no significant relationship between having gay/lesbian neighbor(s) and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010. See Table 18.
Table 18

Contingency Table of Gay/Lesbian Neighbor(s) by Teacher Diversity Belief Typology

<table>
<thead>
<tr>
<th>Gay/Lesbian Neighbor</th>
<th>Typology 1</th>
<th>Typology 2</th>
<th>Typology 3</th>
<th>Typology 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of</td>
<td>% of</td>
<td>% of</td>
<td>% of</td>
</tr>
<tr>
<td></td>
<td>f score</td>
<td>f score</td>
<td>f score</td>
<td>f score</td>
</tr>
<tr>
<td>No</td>
<td>4 13.3</td>
<td>12 40.0</td>
<td>10 33.3</td>
<td>2 6.7</td>
</tr>
<tr>
<td>Yes</td>
<td>0 0.0</td>
<td>1 3.3</td>
<td>0 0.0</td>
<td>1 3.3</td>
</tr>
</tbody>
</table>

In the area of gay/lesbian neighbor by teacher diversity belief typology it was shown that 100% of the teachers who responded ‘yes’ to having a gay/lesbian neighbor belonged to Typology 2 as opposed to 42% of teachers who do not have gay/lesbian teachers who belong to Typology 2.

Gay/lesbian authors/writers/texts by teaching typology. Null Hypothesis 1k: There is no relationship between having exposure to gay/lesbian authors, writers or texts and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

The null hypothesis was retained ($\chi^2 = 1.996, df = 3, P = .580$). Therefore, there was no significant relationship between having exposure to gay/lesbian authors, writers and texts and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010. See Table 19.
Table 19

*Contingency Table of Gay/Lesbian Authors/Writers/Texts by Teacher Diversity Belief Typology*

<table>
<thead>
<tr>
<th>Gay/Lesbian Authors/Writers Texts</th>
<th>Typology 1</th>
<th></th>
<th></th>
<th></th>
<th>Typology 2</th>
<th></th>
<th></th>
<th></th>
<th>Typology 3</th>
<th></th>
<th></th>
<th></th>
<th>Typology 4</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>% of score total</td>
<td></td>
<td></td>
<td></td>
<td>f</td>
<td>% of score total</td>
<td></td>
<td></td>
<td></td>
<td>f</td>
<td>% of score total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>13.3</td>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td>40.0</td>
<td></td>
<td></td>
<td></td>
<td>8</td>
<td>26.7</td>
<td></td>
<td></td>
<td>3</td>
<td>10.0</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
<td>0.0</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>3.3</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>6.7</td>
<td></td>
<td></td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Having exposure to gay/lesbian authors/writers/texts by teacher diversity belief typology showed that 1/3 of the teachers who stated they had been exposed to gay/lesbian authors/writers/texts belong to Typology 2 with 2/3 of the same group belonging to Typology 3. Of those who had not had any exposure to gay/lesbian authors/writers/texts, 43% belonged to Typology 2 and 35% belonged to Typology 3.

**Gay/lesbian(s) in media by teaching typology.** Null Hypothesis 1l: There is no relationship between having exposure to gay/lesbian(s) in the media and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

The null hypothesis was retained ($\chi^2 = 5.421, \text{df} = 3, P = .143$). Therefore, there was no significant relationship between having exposure to gay/lesbian(s) in the media and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010. See Table 20.
Table 20

Contingency Table of Gay/Lesbian(s) in Media by Teacher Diversity Belief Typology

<table>
<thead>
<tr>
<th>Gay/Lesbian In Media</th>
<th>Typology 1</th>
<th>Typology 2</th>
<th>Typology 3</th>
<th>Typology 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>% of score total</td>
<td>f</td>
<td>% of score total</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>10.0</td>
<td>8</td>
<td>26.7</td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>3.3</td>
<td>5</td>
<td>16.7</td>
</tr>
</tbody>
</table>

The largest group of teachers who stated they had been exposed to gay/lesbians in the media (55%) belonged to Typology 2. In contrast only 38% of teachers who answered ‘no’ to having been exposed to gay/lesbians in the media were in Typology 2 with 38% of the same group belonging to Typology 3.

**Foreign vacation travel by teaching typology.** Null Hypothesis 1m: There is no relationship between participating in foreign vacation travel and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

The null hypothesis was retained ($\chi^2 = 1.300$, df = 3, $P = .729$). Therefore, there was no significant relationship between participating in foreign vacation travel and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010. See Table 21.
Table 21

*Contingency Table of Foreign Vacation Travel by Teacher Diversity Belief Typology*

<table>
<thead>
<tr>
<th>Foreign Vacation Travel</th>
<th>Typology 1</th>
<th>Typology 2</th>
<th>Typology 3</th>
<th>Typology 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of score total</td>
<td>% of score total</td>
<td>% of score total</td>
<td>% of score total</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3.3</td>
<td>20.0</td>
<td>13.3</td>
<td>13.0</td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>7</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>10.0</td>
<td>23.3</td>
<td>20.0</td>
<td>3.3</td>
</tr>
</tbody>
</table>

In looking at foreign vacation travel by teacher diversity belief typology 41% and 35% of teachers who answered ‘yes’ to participating in foreign vacation travel fell within Typology 2 and Typology 3 respectively. Of teachers who stated they had not participated in foreign vacation travel, 46% belonged to Typology 2 with 31% belonging to Typology 3.

**Domestic vacation travel by teaching typology.** Null Hypothesis 1n: There is no relationship between participating in domestic vacation travel and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

The null hypothesis was retained ($\chi^2 = 1.886, df = 3, P = .596$). Therefore, there was no significant relationship between participating in domestic vacation travel and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010. See Table 22.
Table 22

*Contingency Table of Domestic Vacation Travel by Teacher Diversity Belief Typology*

<table>
<thead>
<tr>
<th>Domestic Vacation Travel</th>
<th>Typology 1</th>
<th>Typology 2</th>
<th>Typology 3</th>
<th>Typology 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of</td>
<td>% of</td>
<td>% of</td>
<td>% of</td>
</tr>
<tr>
<td></td>
<td>f score total</td>
<td>f score total</td>
<td>f score total</td>
<td>f score total</td>
</tr>
<tr>
<td>No</td>
<td>1 3.3</td>
<td>6 20.0</td>
<td>3 10.0</td>
<td>2 6.7</td>
</tr>
<tr>
<td>Yes</td>
<td>3 10.0</td>
<td>7 23.3</td>
<td>7 23.3</td>
<td>1 3.3</td>
</tr>
</tbody>
</table>

Domestic vacation travel results showed that those who had traveled domestically were split evenly (38% to 38%) between Typology 2 and Typology 3, while those who had not traveled domestically belonged 50% to Typology 2 and 25% to Typology 3.

**Work/school in another country by teaching typology.** Null Hypothesis 1o: There is no relationship between working and/or attending school in another country and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

The null hypothesis was retained ($\chi^2 = 5.337$, df = 3, P = .149). Therefore, there was no significant relationship between working and/or attending school in another country and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010. See Table 23.
Table 23

*Contingency Table of Work/School in Another Country by Teacher Diversity Belief Typology*

| Work/School In Another Country | Typology 1 | | | Typology 2 | | | Typology 3 | | | Typology 4 |
|-------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
|                               | % of score total | f | % of score total | f | % of score total | f | % of score total | f | % of score total | f |
| No                             | 10.0 | 3 | 43.3 | 13 | 23.3 | 7 | 10.0 | 3 | 10.0 |
| Yes                            | 3.3  | 1 | 0.0  | 0  | 10.0 | 0 | 0.0  | 0 | 0.0  |

In examining teacher diversity belief typologies of teachers who have worked or attended school in another country, 75% belonged to the least tolerant Typology 3 with 25% belonging to Typology 1. Teachers who stated they had not worked or attended school in another country had 50% belonging to Typology 2 and 25% belonging to Typology 3.

**Work/volunteer Peace Corps/Vista by teaching typology.** Null Hypothesis 1p: There is no relationship between working or volunteering in Peace Corps/Vista and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

The null hypothesis was retained ($\chi^2 = .701, \text{df} = 3, \ P = .873$). Therefore, there was no significant relationship between working or volunteering in Peace Corps/Vista and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010. See Table 24.
Table 24

Contingency Table of Work/Volunteer Peace Corps/Vista by Teacher Diversity Belief Typology

<table>
<thead>
<tr>
<th>Work/Vol Peace Corp/ Vista</th>
<th>Typology 1</th>
<th>Typology 2</th>
<th>Typology 3</th>
<th>Typology 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of score total</td>
<td>% of score total</td>
<td>% of score total</td>
<td>% of score total</td>
</tr>
<tr>
<td>No</td>
<td>4 6.7</td>
<td>12 10.0</td>
<td>9 20.0</td>
<td>3 3.3</td>
</tr>
<tr>
<td>Yes</td>
<td>0 0.0</td>
<td>1 3.3</td>
<td>1 3.3</td>
<td>0 0.0</td>
</tr>
</tbody>
</table>

Of the teachers who stated that they had worked or volunteered in the Peace Corps or Vista program, 50% were in Typology 2 with 50% falling in the category of Typology 3. Of those who stated they had not worked in the Peace Corps or Vista program 43% and 32% fell within Typology 2 and Typology 3 respectively.

**Work/volunteer in inner-city program by teaching typology.** Null Hypothesis 1q: There is no relationship between working or volunteering in Inner-city programs and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

The null hypothesis was retained ($\chi^2 = .701$, df = 3, $P = .873$). Therefore, there was no significant relationship between working or volunteering in inner-city programs and teacher diversity belief typologies of middle level math teachers in the diverse schools of North Georgia in 2009-2010. See Table 25.
Table 25

Contingency Table of Work/Volunteer in Inner-city Program by Teacher Diversity Belief Typology

<table>
<thead>
<tr>
<th>Inner City prog</th>
<th>Typology 1</th>
<th></th>
<th></th>
<th>Typology 2</th>
<th></th>
<th></th>
<th>Typology 3</th>
<th></th>
<th></th>
<th>Typology 4</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>% of</td>
<td>% of</td>
<td></td>
<td>% of</td>
<td>% of</td>
<td></td>
<td>% of</td>
<td>% of</td>
<td></td>
<td>% of</td>
</tr>
<tr>
<td>% of score total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>6.7</td>
<td>9</td>
<td>30.0</td>
<td>6</td>
<td>20.0</td>
<td>2</td>
<td>6.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>6.7</td>
<td>4</td>
<td>13.3</td>
<td>4</td>
<td>13.3</td>
<td>1</td>
<td>3.3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In looking at work/volunteer in inner-city programs by teacher diversity belief typology, of those that stated they had worked in such settings 36% fell within Typology 2 with an equal 36% falling within Typology 3. Of those who stated they had not worked in inner city programs, 47% belonged to Typology 2 and 31% to Typology 3.

Research Question 3

Research Question 3: Is there a significant relationship between diversity belief typologies and average student mathematics achievement scores (ASMA) of teachers in middle level classrooms serving diverse populations?

Null Hypothesis 2: There is no relationship between teacher diversity belief typologies and average student mathematics achievement scores (ASMA) of middle level math teachers in the diverse schools of North Georgia in 2009-2010.

This hypothesis was tested using one-way ANOVA. The null hypothesis in terms of highest average math score (highest ASMA score) was retained \( F(3, 26) = .779, p = .517 \). There was no significant difference in teacher ASMA score (highest class average) and teacher belief typology. See Table 26.
Table 26

ANOVA Table for Null Hypothesis 2 – Highest ASMA Score

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>83.047</td>
<td>3</td>
<td>27.682</td>
<td>.779</td>
<td>.517</td>
</tr>
<tr>
<td>Within Groups</td>
<td>924.419</td>
<td>26</td>
<td>35.555</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1007.467</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The null hypothesis in terms of lowest average math score (lowest ASMA score) was also retained $F(3, 26) = 1.036, p = .393$. There was no significant difference in teacher ASMA score (lowest class average) and teacher belief typology. See Table 27.
Table 27

ANOVA Table for Null Hypothesis 2 – Lowest ASMA Score

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>625.292</td>
<td>3</td>
<td>208.431</td>
<td>1.036</td>
<td>.393</td>
</tr>
<tr>
<td>Within Groups</td>
<td>5228.874</td>
<td>26</td>
<td>201.111</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5854.167</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The researcher had proposed that teacher belief typologies and student achievement are related and can therefore be treated as interactive variables. Based on this theory, it was proposed that the higher the combined teacher score on the PerBADS/ProBADS, the greater the level of his/her students’ achievement. In other words, teachers who fall within the range of Typology 2 (High Professional/High Personal) would have higher student achievement than those in Typology 1 (High Professional/Low Personal), Typology 3 (Low Professional/Low Personal) or Typology 4 (Low Professional/High Personal).

This theory was rejected due to the null hypothesis being retained and the sample size being too small to produce significant results. Interestingly, the data that was gathered showed that the higher average ASMA scores (92) belonged to teachers in
Typology 4. The lowest average ASMA scores (62.5) belonged to teachers in Typology
1. These results, however, cannot be generalized due to the small number of overall
participants. Figures 3 and 4 show the means plot for highest and lowest score
respectively.

Figure 3: Lowest ASMA by Teacher Diversity Belief Typology

*Figure 3. Lowest average student math achievement score according to teacher diversity
belief typology*
Summary

This study explored the development of teacher diversity belief typologies and examined the relationship between teacher diversity belief typologies and teacher ASMA scores/demographics. A total of 30 middle level math teachers participated in the study. Demographics show that the majority of participants were White (86.7%) females (79.3%), which is representative of the U.S. teaching force in general. Over half (60%) of the participants had taught for 1-10 years, with approximately half (53.3%) coming from middle class backgrounds.
Four typologies were developed based on the combined scores from the ProBADS and PerBADS. The four typologies were as followed: High Professional/Low Personal (Typology 1), High Professional/High Personal (Typology 2), Low Professional/Low Personal (Typology 3) and Low Professional/High Personal (Typology 4). In the High Professional/Low Personal typology, teachers had a high tolerance for diversity in school settings while experiencing low tolerance for diversity in a personal setting. In the High Professional/High Personal typology, teachers had a high tolerance for diversity in both school settings and personal situations. The Low Professional/Low personal was comprised of teachers having a low tolerance for diversity in both school settings and personal situations. Teachers in the Low Professional/High Personal category had a low tolerance for diversity in school settings while experiencing a high tolerance for diversity in a personal setting.

Almost forty-five percent (43.3%) of the teachers fell under the High Professional/High Personal typology, followed by one-third (33.3%) in the Low Professional/Low Personal typology, 13.3% in the High Professional/Low Personal typology and 10.0% in the Low Professional/High Personal typology.

Hypotheses tested with chi-square showed no significant relationship between teacher diversity belief typologies and the teacher demographics of race/ethnic background, gender, years teaching, education level, frequency of exposure to diversity, participation in multicultural coursework and/or cultural experiences). However, there was a significant relationship between having a gay/lesbian personal friend(s) and teacher diversity belief typologies. Two out of three participants who had gay/lesbian friend(s)
had both high professional and high personal diversity beliefs (Typology 2). The third hypothesis tested using one-way ANOVA showed there was no relationship between teacher diversity belief typologies and ASMA scores.
Chapter 5 presents a summary of the study, the findings, the conclusions, and future recommendations. The summary includes the statement of the problem, a brief examination of problems encountered, a reflection on the research methodology and a description of the participants.

**Summary**

Teacher beliefs are deeply ingrained and can have a profound effect on the educational experience of their students. One of the more important beliefs to consider is that of teacher diversity beliefs. Many of these beliefs are influenced by the school experiences teachers were exposed to as students. Diversity beliefs held by teachers are especially relevant in today’s multicultural school settings. Literature suggests that teacher beliefs regarding diversity can impact student education in many contexts including curriculum, teaching practices, discipline, achievement and the teacher/student relationship.

A growing issue related to the increasingly diverse population is the lower academic achievement of many minority students. According to Banks’ (1998B) philosophy of multiculturalism, diversity issues, regardless of what type or characteristic, should not interfere with a student’s ability to learn. Students with cultural backgrounds that differ from the majority of the student population may face communication issues, discrimination and/or lower expectations.
In order to address these issues it has been suggested that teachers willingly examine their preconceived beliefs about diverse students and strive to develop culturally aware practices. This awareness can aid diverse students in overcoming barriers that may keep them from experiencing the same educational opportunities and academic success as their peers (Hinojosa & Moras, 2009; Hollins & Guzman, 2005). Therefore it is apparent that teacher diversity beliefs could have a direct impact on student achievement. Other variables that could impact student achievement are race/ethnic background, gender, years of teaching experience, educational level, and exposure to diverse populations. Additionally, whether a teacher has participated in multicultural/diversity training and the number of cultural experiences he or she has had can impact his or her views and expectations towards students of color (Villegas, 2008).

**Statement of the Problem**

In consideration of the need to better evaluate the impact of diversity beliefs on student achievement, the following question guided this research: Is there a significant relationship between teacher diversity belief typologies and average student mathematics achievement scores (ASMA) of teachers in middle level classrooms serving diverse populations?

In order to examine if there is a relationship between teacher belief typologies and ASMA scores, the study aimed to develop teacher diversity belief typologies for middle level math teachers serving diverse populations in North Georgia.

**Review of Research Methodology**

The research data were gathered using a self-report demographic data sheet that
covered the teacher’s personal background, experience and/or exposure to diversity, and his or her students’ math functioning (both strongest and weakest performing classes). The statistical analysis was done using SPSS Version 17. A two-dimensional approach developed by Pohan and Aguilar (2001) was used to develop the teacher diversity belief typologies. Both personal and professional diversity beliefs were examined using the personal Beliefs About Diversity Scale (PerBADS) and the Professional Beliefs About Diversity Scale (ProBADS) respectively. The teacher diversity belief typology model was developed by the researcher to categorize the responses on the PerBADS and ProBADS. A descriptive analysis of the demographic variables (race/ethnicity, gender, years teaching, education level, exposure to diversity, participation in multicultural coursework and/or cultural experiences) was utilized. The null hypotheses were tested using chi-square.

**Description of the Participants**

A total of 30 middle level math teachers participated in the study on teacher belief typologies and student achievement. The survey was sent to 65 middle level math teachers that resulted in a return rate of slightly less than fifty percent. The study started with 36 participants, however, 6 participants chose to withdraw from the study without explanation.

As can be seen from the following data, the participants from this study reflected the typical teacher demographics common in U. S. schools: White, female and middle-class. Approximately three-fourths of the participants were female teachers (79.3%) in comparison to male teachers (20.7%). One participant declined to specify gender. The
majority of the participants were White (86.7%), with only 13.3% of the participants identifying themselves as Black. No other ethnic backgrounds were represented in the study. Over half (53.3%) identified themselves as having come from middle-class backgrounds. Two-thirds of the participants had obtained undergraduate (33.3%) or masters level (33.3%) degrees. The next largest category consists of specialist degrees (26.7%) with less than ten percent completing a doctorate degree (6.7%).

The majority of the population had taught less than 10 years with 33.3% having taught 1-5 years and 26.7% having taught 6-10 years. Approximately five percent of participants had taught for 11-15 years (6.7%) with a slightly higher percentage of approximately 10% teaching in the 16-20 years, 21-25 years and over 30 years categories (9.1%) respectively. Only approximately 3% of the participants had taught in the 26-30 year range (3.3%).

Approximately one-third of the participants taught 5th grade (33.3%). The second largest group of participants taught 8th grade (24.2%). The rest of the participants were split almost evenly between 6th grade (18.2%) and 7th grade (15.2%).

**Results**

Four typologies were developed based on the combined scores from the ProBADS and PerBADS. The four typologies were as followed: High Professional/Low Personal (Typology 1), High Professional/ High Personal (Typology 2), Low Professional/Low Personal (Typology 3) and Low Professional/ High Personal (Typology 4). Hypotheses tested with chi-square showed no significant relationship between teacher diversity belief typologies and the teacher demographics of race/ethnic background,
gender, years teaching, education level, frequency of exposure to diversity, participation in multicultural coursework and/or cultural experiences. However, there was a significant relationship between having a gay/lesbian personal friend(s) and teacher diversity belief typologies. The third hypothesis tested using one-way ANOVA showed there was no relationship between teacher diversity belief typologies and ASMA scores.

Findings and Discussion

Research Question 1: Development of Teacher Diversity Belief Typologies

A review of multicultural and diversity literature suggests that effective teachers must hold beliefs that encourage educational equity and support the development of cross-cultural understanding. Past research has shown, however, that many teachers hold negative beliefs about diverse students which impact both instruction and student achievement. Banks and Banks (1993) state that “multicultural and sensitive teaching materials are ineffective in the hands of teachers who have negative attitudes [and beliefs] toward different cultural groups” (p. 22).

According to Pohan and Aguilar (2001), one of the most important questions guiding education in recent years is: “How do we best help future and current teachers acquire the knowledge, skills, and attitudes that would result in culturally responsive teaching?” (p. 160). Measuring teacher beliefs about diversity and developing teacher diversity belief typologies can help to identify, organize and further extend understanding of diversity issues. Understanding the problem is the first step in creating more culturally competent educators.
The teacher diversity belief typology model was developed for this research as a means to categorize teacher diversity beliefs. In looking at the diversity scales it was apparent that teachers could score high and/or low on both the PerBADS and the ProBADS. This gave four possible outcomes that could occur: high professional/low personal, high professional/high personal, low professional/low personal, and low professional/high personal. Pohan and Aguilar (2001) explain that the higher the score for each scale, the greater an individual’s acceptance toward diversity issues. Therefore it was hypothesized that individuals who fall within the high professional/high personal typology will be more accepting of diversity than those in the other typologies.

None of the participants of this study scored at the lowest or highest ends of the scales. The mean for the PerBADS for this study was 53, which is slightly lower than the means found by Pohan and Aguilar of a 56.23 to 64.41 range. The mean for the ProBADS for this study was 84, which is also lower than the 91.41 to 105.65 range found in the study by Pohan and Aguilar. This difference may be due to the smaller sample of this study and/or the fact that all of the participants came from neighboring districts with a high Hispanic student population. This may have decreased the range of beliefs about diversity normally experienced in a study of this type.

Results showed that the largest group belonged to high professional/high personal scorers in Typology 2 (43.3%) followed by the low professional/low personal scorers in Typology 3 (33.3%). Only 13.3% scored in the high professional/low personal range of Typology 1, with the lowest percentage (10.0%) scoring in the low professional/high personal range of Typology 4.
In looking at the breakdown of participants by teaching typology, the majority (76.7%) fell under the high professional/high personal category or the low professional/low personal category. This would seem to indicate that for most individuals in this study, personal and professional beliefs were typically at the same level. Therefore, the results suggest that most individuals who have high personal diversity beliefs will also have high professional diversity beliefs while those with low personal diversity beliefs will also have low professional diversity beliefs.

The smaller percentage (23.3%) of participants that fell in the high professional/low personal and low professional/high personal typologies can be explained by considering Pohan and Aguilar (2001) who stated that personal and professional diversity are often at conflict with one another and therefore both need to be examined. They state:

There might be a situation in which one’s personal beliefs about a given issue could be in direct conflict with his/her beliefs in a professional context. For example, in a personal context, an educator might believe that bilingualism is an asset in today’s increasingly diverse and global society. Within a professional (i.e., schooling) context, however, this same educator might reject the notion of public monies being spent on bilingual education (i.e., maintenance programs) (p. 160)

Teachers may also be aware of what is politically correct in regards to teaching diverse students, regardless of their true beliefs. Teachers are constantly exposed to terminology such as diversity, multicultural or cultural awareness, and social justice in
pre-service classes, teacher collaboration and professional development. They know what is expected of teachers and therefore may answer accordingly without truly examining their beliefs. However, their personal beliefs regarding diversity may reflect their true feelings on the same topic since they may feel more open to answering truthfully since there is no preconceived idea of what is considered to be correct.

The sample of teachers was limited due to the small number of middle level math teachers per school and the difficulty obtaining district approval to conduct the research. A larger sample of teachers may have led to a higher distribution among the typologies. The majority of the teachers in the sample did belong to Typology 2, the most accepting of diversity. This may reflect the fact that all of the teachers that participated worked in districts with largely Hispanic populations. The unique characteristics of such schools along with the daily exposure to diversity may have increased the levels of acceptance. Results may have varied if teachers from districts with a more varied population of diverse students were used.

It is important to identify and classify teacher diversity belief typologies because of their potential impact in all areas of education. This study focused on the relationship between teacher diversity belief typologies and student achievement, but multiple studies have linked teacher beliefs not only to student achievement through teaching, learning, curriculum and assessment (Elliot & Schiff, 2001), but also teacher behavior (Pohan & Aguilar, 2001), lower expectations of minority students (Banks, 1998B), communication issues (Murrell, 1994), and stereotypes, biases, or cultural misconceptions (Pohan &
Identifying these types of beliefs and understanding the potential impact on students is imperative if we want to impact and increase achievement for diverse students.

To better understand the role of teacher diversity belief typologies on student achievement, further research with a larger and more diverse teacher populations is needed. Teacher educators, pre-service teachers and practicing teachers must realize that issues related to teacher diversity beliefs cannot be solved until they are recognized and thoroughly examined. Some related questions future research should explore are the following: Do teacher diversity belief typologies indicate what type of teaching will occur in the classroom? Do teacher belief typologies impact the student/teacher relationship? Are there teacher demographics that seem to impact teacher diversity belief typologies? What types of practices or interventions can lead to a change in teacher diversity belief typology? More research is needed in order to better understand how diversity beliefs develop, what impacts teacher diversity belief typologies and what impact does each of the teacher diversity belief typologies have on student achievement.

**Research Question 2: Teacher Diversity Belief Typologies & Teacher Demographics**

In the second research question the relationship between teacher diversity belief typologies and teacher demographics (ex. race/ethnic background, gender, years teaching, education level, exposure to diversity, participation in multicultural coursework and/or cultural experiences) was tested using chi-square. Many of the categories resulting from the chi-square had small numbers due to the small population of the study. The null hypotheses were retained and/or could not be tested due to the sample size, with the only
exception being the factor of having a gay/lesbian personal friend. Although the results were found not to be significant, several tendencies were seen in this study.

Exposure to a personal friend who is gay or lesbian did increase an individual’s acceptance and/or tolerance of diverse individuals. The results revealed that teachers who had gay/lesbian personal friend(s) scored higher on the diversity scales and therefore belonged more to Typology 2 (High Professional/High Personal). Of the 60% of teachers who answered ‘yes’ to having gay/lesbian friend(s), 40% scored in the High Professional/High Personal typology. In contrast, of the 40% of teachers who answered ‘no’ to having gay/lesbian personal friend(s), only 3.3% scored in the High Professional/High Personal typology.

This finding is of interest because the topic of sexual orientation is often considered to be taboo and thus can be seen as sensitive. Lee (1993) defines taboo topics as ones “which are laden with emotion or which inspire feelings of awe or dread” (p. 2). Most individuals have strong feelings regarding homosexuality that usually form during the teenage years when one is more susceptible to influence. An individual’s perception and/or attitude toward homosexuals is developed during social interactions with parents, friends, the media and educational or religious environments (Ballard & Morris, 1998).

Existing data on attitudes regarding homosexuality are limited, but the research that does exist shows some promising results regarding exposure and its effects on attitudes and beliefs. Many researchers feel that exposure to homosexual issues and/or individuals can have a positive impact on increased acceptance of homosexuality. In their study Mazar and Emmers-Sommers (2002) found that individuals who watched a film
about a nontraditional gay family showed decreased prejudice toward gay lifestyles. In a similar study, Shiappa, Gregg and Hewes (2006) monitored repeated viewings of the show Will and Grace by undergraduate college students. They found that the more frequently the episodes were viewed, the more accepting the students became of gay men.

This seems to suggest that exposure, specifically repeated exposure, can have an impact on beliefs, perceptions and attitudes. In this study, individuals who reported exposure that was of a repetitive nature such as having a gay/lesbian friend, neighbor or professional contact, scored higher on the diversity scales than other teachers. In the area of gay/lesbian neighbor by teaching typology it was shown that 100% of the teachers who responded ‘yes’ to having a gay/lesbian neighbor belonged to Typology 2 as opposed to 42% of teachers who do not have gay/lesbian teachers who belong to Typology 2. This may suggest that living near people who are diverse may lead to a better understanding of diversity issues. The results of gay/lesbian professional contact(s) by teaching typology show that 52% of teachers who answered yes to having gay/lesbian professional contacts belonged to Typology 2 as compared to 27% of teachers who answered ‘no’ to having gay/lesbian professional contacts.

The testing of no exposure by teaching typology found that 100% of teachers who stated that they had not had any exposure to gay/lesbian individuals belonged to Typology 1 (high professional/low personal). It is interesting to note that these individuals scored high when it came to diversity issues they encounter as teachers, but scored low in those one might encounter in personal settings.

Having exposure to gay/lesbians in the media also seems to have an impact on
teacher diversity belief typologies. The largest group of teachers who stated they had been exposed to gay/lesbians in the media (55%) belonged to Typology 2. In contrast only 38% of teachers who answered ‘no’ to having been exposed to gay/lesbians in the media were in Typology 2 with 38% of the same group belonging to Typology 3.

The cultivation theory (Gerbner, Gross, Morgan, Signorielli, & Shanahan, 2002) is based on the suggestion that television is the driving force that shapes an individual’s social reality. Media is also the outlet where most youths learn most of their sexual information (Brown, Halpern, & L’Engle, 2005). Portrayals of homosexuals in the media are important, as they may be the main source of information for individuals who do not personally know a gay person (Pew Research Center, 2003).

Although the sample size of this study was small, the results seem to support the cultivation theory. In general, individuals are more fearful and/or suspicious of diverse characteristics in which they lack information and/or exposure. Being exposed to homosexuality or other types of diversity through a relatively comfortable outlet such as the media can help an individual become more comfortable, and therefore more accepting, of those unlike themselves. More research regarding exposure of homosexuality and its subsequent effect on individuals is needed.

Although test results came back as statistically insignificant, other patterns regarding race, gender, teaching experience, level of education and socioeconomic background were seen in this study. Minority and female teachers tended to have a higher level of tolerance for diversity issues. One hundred percent of Black teachers and 50% of female teachers belonged to Typology 2 in contrast to 33% of White teachers and 16% of
male teachers. More experienced teachers, those having taught more than 11 years, were twice as likely to belong to Typology 2 than those having taught 10 years or less. Another interesting pattern showed that tolerance and understanding of diversity issues tended to increase with level of education. Teachers with doctorate degrees belonged 100% to Typology 2.

Mixed results were seen for socioeconomic background. Those from poor or working class backgrounds belonged 100% and 75% to Typology 2 respectively, while 60% of teachers from upper class backgrounds belonged to Typology 2. Only 18% of those with middle class backgrounds were in Typology 2.

Other areas of exposure such as foreign and domestic vacation travel, work/school in another country, work/volunteering in the Peace Corps or Vista program and work/volunteering in inner-city programs did not seem to have an impact on teacher diversity belief typologies. These unexpected results contradict literature that suggests exposure leads to a higher level of understanding and/or tolerance. More research on exposure is needed to better understand how it impacts beliefs.

**Research Question 3: Teacher Diversity Belief Typologies & ASMA Scores**

The relationship between teacher diversity belief typologies and average student mathematics achievement scores (ASMA) of middle level math teachers in the diverse schools of North Georgia in 2009-2010 was tested using one-way ANOVA. The null hypothesis in terms of highest average math score (highest ASMA score) was retained. There was no significant difference in teacher ASMA score (highest class average) and teacher belief typology. The null hypothesis in terms of lowest average math score
(lowest ASMA score) was also retained. There was no significant difference in teacher
ASMA score (lowest class average) and teacher belief typology.

These results contradict other research that shows a connection between teacher
beliefs and student achievement. Stiefel, Schwartz and Ellen (2007) concluded that
teachers’ attitudes toward ethnic minority students can directly impact student
expectations and performance. Mckown and Weinstein (2002) found that “teacher
expectations can differentially affect the members of different student groups, favor
nonstigmatized groups over stigmatized groups, and thereby exacerbate the achievement
gap for groups of students from different ethnic backgrounds” (p. 161). If teacher beliefs
affect a wide range of teacher behaviors from thoughts and actions to classroom
procedures, problem solving, materials covered and grading (Kagan, 1992B; Kennedy,
1990), then it is reasonable to expect that they would have a direct impact on student
achievement.

This research had proposed that teacher belief typologies and student achievement
were related and therefore could be treated as interactive variables. Based on this theory,
it was proposed that the higher the combined teacher score on the PerBADS/ProBADS,
the greater the level of his/her students’ achievement. In other words, it was proposed that
teachers who fall within the range of Typology 2 (High Professional/High Personal)
would have higher student achievement than those in Typology 1 (High Professional/
Low Personal), Typology 3 (Low Professional/ Low Personal) or Typology 4 (Low
Professional/High Personal).

This theory was rejected due to the null hypothesis being retained and the sample
size being too small to produce significant results. The data showed that the highest average ASMA scores (92) belonged to teachers in Typology 4 in contrast to the 86.3 average score of teachers in Typology 2. The lowest average ASMA scores (62.5) belonged to teachers in Typology 1. The ASMA scores amongst the typologies did not reflect a very large range. The scores may be close due to the sample coming from similar districts in North Georgia. This population of teachers may have increased sensitivity to diversity and/or the survey questions due to the largely Hispanic student population present in their schools. The small sample size may have also had an effect on the range of scores. A larger population of teachers may have produced a wider range of scores amongst the different typologies.

More research on the relationship between teacher diversity beliefs and student achievement is needed since the results of this study conflict with previous research on teacher beliefs and the impact on student performance. For future research, a larger sample of teachers from districts that are not as similar may provide a greater variation in scores and diversity belief typologies.

**The Limitations of Sensitive Research**

One of the key issues that arose in this study was the limited population size. The original intent was to obtain a population of 100-200 teachers. However, during the attempt to obtain district approval it became apparent that many of the districts did not want to be involved due to the sensitive nature of the study. Although IRB approval had been granted to conduct the research, several district representatives and one principal declined to participate stating they were not interested in this type of study. The largest
district contacted declined to participate because the committee for research review believed the survey questions to be inappropriate. Of those who participated, six teachers withdrew from the study by not finishing the surveys and exiting the survey site. Results of this study were therefore limited due to the small number of participants.

This raises the question of how important yet sensitive issues can be addressed and/or examined when a reluctance to discuss and/or participate in this type of research exists. McCosker, Barnard & Gerber (2001) state:

There are many phenomena that within specific cultural and social context are sensitive. They may be defined as sensitive if they are private, stressful or sacred, and discussion tends to generate an emotional response, for example death and sex. Phenomena that deal with the potential fear of stigmatization, such as the study of sub-cultures, and studies that may reveal information of a politically sensitive nature may also be considered sensitive. (p.1)

Topic areas that seem personal may be too emotional for some participants. Research covering such topics can be stressful for both the researcher and participants (Dickson-Swift, James & Liamputtong, 2008). Certain topics, such as race and sexual orientation, can evoke an unintended emotional response. Apparently the subject matter of this study may have caused such a response. Explaining the study, obtaining district approval, and collecting data from reluctant individuals hindered the research process. These issues resulted in an extended study timeline and a lower number of study participants. Approximately 1/6 of those who started the study withdrew without explanation. Although no specific reason can be given, the high levels of reluctance
encountered during various stages of the study may also account for the withdrawal of these participants. Other factors such as lack of time, interruptions, and length of survey may also have resulted in participant attrition.

It is important to conduct research on sensitive topics despite the issues that may arise. Teacher diversity beliefs are important to examine due to their potential impact on student achievement and student/teacher interactions. Even though over two decades have passed since Sieber and Stanley (1988) addressed this topic, their point is still relevant today. They state:

Sensitive research addresses some of society’s most pressing social issues and policy questions. Although ignoring the ethical issues in sensitive research is not a responsible approach to science, shying away from controversial topics, simply because they are controversial, is also an avoidance of responsibility. (p. 6)

Steps should be taken when conducting sensitive research to minimize problems for both the researcher and participants. Lee (1993) suggests using confidential surveys and/or qualitative research when studying sensitive topics. This study used anonymous surveys yet some participants still may not have been comfortable answering the questions. The study was also quantitative rather than qualitative, which is a disadvantage according to Lee, because it does not “allow people to develop and express their own reality” (p. 7).

Sensitive topics including those found in this study need to be investigated further in order to better understand and address social and educational issues. Researchers must find ways to deal with issues that may arise in sensitive research. This, however, may not
counteract problems when potential participants refuse to participate in studies they see as sensitive despite the researcher taking measures to maintain confidentiality and remain neutral.

**Recommendations**

**Recommendations for Further Research**

1. Further studies should be conducted with a larger teacher population in order to increase the validity of the study. In this study, the population was limited which directly impacted the results. A larger population would be better suited to satisfy the assumptions of chi square testing.

2. Further studies should be conducted on a more diverse teacher population in order to increase the validity of the study. This task may be difficult since the majority of teachers are White, female and middle-class. Pohan and Aguilar (2001) suggest that researchers purposively select schools that are historically Black or Hispanic to try to find a more diverse staff. They also suggest that finding a more diverse study population will show a larger racial difference in scores with minorities showing higher scores on the diversity scales.

3. Further studies could be conducted on a different population of teachers (i.e. elementary, high school, and different subject matters). Although this study was limited to middle level math teachers, it would be interesting to examine if the similar results/trends are seen in different populations.

4. Other predictor variables could be examined to see if there is a significant relationship in regards to teacher belief typologies. The researcher chose to limit the
study to specific demographics such as race/ethnic background, gender, years teaching, education level, exposure to diversity, participation in multicultural coursework and/or cultural experiences. Other factors such as age, subject matter taught, religious background and/or exposure to different religions are examples of demographics that may impact teacher diversity belief typologies.

5. Qualitative studies could be utilized to further examine this issue. Lee (1993) suggests using qualitative research when studying sensitive topics. Qualitative studies, according to Lee, will “allow people to develop and express their own reality.” (p. 7). Being able to expand and explain their views on sensitive issues may help participants feel more comfortable with the study.

**Recommendations for Practice**

Despite the non-significant results of this study, there are implications for practice which have emerged from the literature and which are consistent with best educational practices:

1. Design workshops and curriculum, engage in discussions and share information with teachers based on the results of teacher diversity scales in order to increase awareness. Increasing awareness would be a starting point for teachers to evaluate their beliefs and how they affect the classroom. In this study teachers were not privy to their scores and therefore could not be aware of their personal typology belief. The developers of the diversity scales (Pohan & Aguilar, 2001) expand on this by stating:

   Information obtained from the beliefs measures may be used to guide the development of a comprehensive diversity/equity plan, including a revised
curriculum for the development of teachers, counselors, and educational administrators…Scores on the measures can be used to determine whether there is a need for a broader, more inclusive approach to diversity and multicultural staff/teacher development. (p. 177)

2. Recruit and prepare teachers from different racial, ethnic, and urban backgrounds. Delpit (1995) and Irvine (1990) believe for instance, that African American teachers could serve as role models to African American students and bring a better level of understanding of cultural issues specific to African Americans to fellow teachers. One of the trends seen in this study was that 100% of the Black teachers belonged to the high professional/high personal typology. Recruiting minority teachers to serve in the classroom is a way that schools can increase and improve tolerance for diversity.

3. Encourage and look for ways for teachers to increase their exposure to diverse populations, especially populations with which they may be unfamiliar. The exposure methods used in studies regarding homosexuality (Mazar & Emmers-Sommers, 2002; Shiappa, 2006) showed that increasing exposure to diverse individuals such as homosexuals results in increased acceptance. If this is true then it can be assumed that exposure to other diverse populations should also result in increased acceptance.

4. Incorporate multiple strategies during multicultural coursework in teacher education programs to influence pre-service teachers to identify and reflect on their beliefs about diversity. Lawrence and Bunche (1996) and Obidah (2000) conducted promising research showing that strategies such as readings, discussions, films, projects, e-mail exchanges, debates, immersion/exposure to different cultures and individual
meetings with the instructor all helped students to critically examine their beliefs. In this study, teachers with a higher level of education scored higher on the diversity scales. This is important to note since multicultural coursework is often standard in masters and doctoral coursework.

5. Utilize coursework in college classrooms, fieldwork in diverse schools and learning experiences in culturally diverse communities during teacher preparation programs (Sleeter, 2008). Sleeter writes, “These three sites offer different kinds of knowledge and experiential resources that when intentionally connected, have the potential to interrupt racist attitudes and understandings, and help White teachers learn to teach diverse students well” (p. 563).

Conclusions

The goal of this study was to develop teacher diversity belief typologies, examine the relationship between specific teacher demographics and teacher diversity belief typologies and to investigate the relationship between teacher diversity belief typologies and teachers’ average student math achievement scores. Although the participant numbers were too small to draw generalizations and the majority of the null hypotheses tested were retained, the research methodology and research design were sound. The research successfully explored teacher diversity belief typologies and developed a model for teacher diversity belief typology classification. The study also raised interesting questions, revealed further areas for investigation and explored interesting trends discovered from the data analysis.

Exposure to diversity was shown to have potential advantages when dealing with
bias in regards to diversity. Being around those unlike oneself helps to breakdown stereotypes and familiarizes an individual to diversity issues. Exposure can also cause desensitization to unfounded fears thus allowing a foundation toward acceptance to form. Diversity exposure is also beneficial in an educational setting. Researchers have argued that a diverse student population improves both academic and social experiences (Gurin, Dey, Gurin & Hurtado, 2004; Bowen & Bok, 1998).

While some additional research exists, more research is needed in order to better understand what influences teachers' beliefs about diversity and how malleable those beliefs may be. Hollins and Guzman (2005) examine how teachers are prepared to work with diverse populations and state “the multicultural teacher education envisioned by theorists is not in place in practice…” (p. 480). In order to facilitate educators becoming more comfortable with diverse populations Sleeter (2008) proposes a research-based framework for teacher education programs addressing specific topics—such as teachers’ hidden biases and lack of exposure to diversity—that aims to help educators become racially/culturally responsive teachers.

Kagan (1992B) states:

Preservice students enter programs of teacher education with personal beliefs about teaching, images of good teachers, images of self as teacher, and memories of themselves as pupils. These personal beliefs and images generally remain unchanged by a preservice program and follow candidates into classroom practica and student teaching. For professional growth to occur, prior beliefs and images must be modified and reconstructed. (p. 142)
Despite the inconclusive results from this study, it is apparent that teachers hold specific diversity beliefs, and that these diversity beliefs will have an impact on the diverse students they teach. The areas that are affected by teacher beliefs are the very ones that shape a student’s educational experience. Thoughts, actions, classroom procedures, problem solving, discipline, materials covered, expectations, grading, and relationships are all linked to teacher beliefs. Teachers must realize that the beliefs they hold regarding diversity cannot be separated from the actions they use to guide instruction daily in their classrooms. Teacher educators, administrators, practicing teachers and prospective teachers should use tools such as the diversity scales to identify areas that are in need of work and develop tools and/or programs to address diversity issues within their schools and individual classrooms.

Kyles and Olafson (2008) stress the importance of such an intervention by stating:

A continued evaluation using such scales as the Professional and Personal Beliefs about Diversity Scales allows teacher educators and administrators to obtain snapshots of conflicting, converging, or complimentary personal and professional belief systems teachers maintain regarding diversity. Producing teachers who can recite the politically correct tenets of multicultural education without having the personal beliefs and heartfelt commitments to ensure that all students learn in a democratic and equitable classroom environment should not be the outcome of teacher preparation programs. (p. 516)

Teachers must not only practice and promote multicultural education and social justice but must also fully embrace the concepts of efficacy, advocacy and personal
responsibility for the students they teach. Teachers must reflect on their attitudes, perceptions, and beliefs, especially in the area of diversity, in order to provide each and every student with the same educational opportunities. Only when this occurs will we see equitable education for diverse students becoming the norm rather than the exception.
REFERENCES


Barnes, C. J. (2006). Preparing preservice teachers to teach in a culturally responsive


Negative effects of traditional middle school on students’ motivation. *The Elementary School Journal, 93*(5), 553-574. doi: 10.1086/461740


168


Helms, J. E. (1994). The conceptualization of racial identity and other ‘racial’ constructs.


176


Nichols, S. L. (2003). The role of belongingness in middle school students’ motivational adaptation to a new school setting: Do fresh starts make a difference?


Su, Z. (1997). Teaching as a profession and as a career: Minority candidates’


Weissglass, J. (2000). No compromise on equity in mathematics education: Developing


APPENDIX A-1

Personal Beliefs About Diversity Scale (PerBADS)

*Will use a 5 point Likert-type scale with the following ranges: 1 (strongly disagree), 2 (disagree), 3 (neutral, do not agree or disagree), 4 (agree), 5 (strongly agree).

1) There is nothing wrong with people from different racial backgrounds having/raising children.
2) America’s immigrant and refugee policy has led to the deterioration of America.
3) Making all public facilities accessible to the disabled is simply too costly.
4) Accepting many different ways of life in America will strengthen us as a nation.
5) It is not a good idea for same-sex couples to raise children.
6) The reason people live in poverty is that they lack motivation to get themselves out of poverty.
7) People should develop meaningful friendships with others from different racial/ethnic groups.
8) People with physical limitations are less effective as leaders than people without disabilities.
9) In general, White people place a higher value on education than do people of color.
10) Many women in our society continue to live in poverty because males still dominate most of the major social systems in America.
11) Since men are frequently the heads of households, they deserve higher wages than females.
12) It is a good idea for people to develop meaningful friendships with others having a different sexual orientation.

13) Society should not become more accepting of gay/lesbian lifestyles.

14) It is more important for immigrants to learn English than to maintain their first language.

15) In general, men make better leaders than women.
APPENDIX A-2

Professional Beliefs About Diversity Scale (ProBADS)

*Will use a 5 point Likert-type scale with the following ranges: 1 (strongly disagree), 2 (disagree), 3 (neutral, do not agree or disagree), 4 (agree), 5 (strongly agree).

1) Teachers should not be expected to adjust their preferred mode of instruction to accommodate the needs of all students.

2) The traditional classroom has been set up to support the middle-class lifestyle.

3) Gays and lesbian should not be allowed to teach in public schools.

4) Students and teachers would benefit from having a basic understanding of different (diverse) students.

5) Money spent to educate the severely disabled would be better spent on programs for gifted students.

6) All students should be encouraged to become fluent in a second language.

7) Only schools serving students of color need a racially, ethnically, and culturally diverse staff and faculty.

8) The attention girls receive in school is comparable to the attention boys receive.

9) Tests, particularly standardized tests, have frequently been used as a basis for segregating students.

10) People of color are adequately represented in most textbooks today.

11) Students with physical limitations should be placed in the regular classroom whenever possible.

12) Males are given more opportunities in math and science than females.
13) Generally, teachers should group students by ability levels.

14) Students living in racially isolated neighborhoods can benefit socially from participating in racially integrated classrooms.

15) Historically, education has been monocultural, reflecting only one reality and has been biased toward the dominant (European) group.

16) Whenever possible, second language learners should receive instruction in their first language until they are proficient enough to learn via English instruction.

17) Teachers often expect less from students from the lower socioeconomic class.

18) Multicultural education is most beneficial for students of color.

19) More women are needed in administrative positions in schools.

20) Large numbers of students of color are improperly placed in special education classes by school personnel.

21) In order to be effective with all students, teachers should have experience working with students from diverse racial and ethnic backgrounds.

22) Students from lower socioeconomic backgrounds typically have fewer educational opportunities than their middle-class peers.

23) Students should not be allowed to speak a language other than English while in school.

24) It is important to consider religious diversity in setting public school policy.

25) Multicultural education is less important than reading, writing, arithmetic, and computer literacy.
APPENDIX A-3

DEMOGRAPHIC DATA SHEET

INSTRUCTIONS: Please complete the following items as they best describe you and your personal background. All responses are optional, and may be useful in assisting in the interpretation of the scores on the attached Diversity Measures. Please note: Your responses will remain anonymous. This information will not be used to identify you. It will only be used in the analysis of responses to determine relationships (if any) between various demographic groups.

GENDER (circle one): Female Male

AGE GROUP: _____ 20-29 _____ 30-39 _____ 40-49

 _____ 50-59 _____ 60-69 _____ 70-79

RACE/ETHNIC BACKGROUND:

 _____ Black and/or African descent _____ White and/or European descent

 _____ Asian Descent _____ Hispanic/Latino _____ Middle Eastern

 _____ Mixed ethnicity/Biracial _____ Native/Indigenous

 _____ Other: __________________________

CHILDHOOD SOCIOECONOMIC CLASS BACKGROUND (circle one only):

 Poor/Lower Working Middle Upper Middle Elite/Wealthy

EDUCATIONAL LEVEL COMPLETED (Degree finished):

 _____ Undergraduate _____ Master _____ Specialist _____ Doctorate

YEARS TAUGHT:

 _____ 1-5 _____ 6-10 _____ 11-15 _____ 16-20

 _____ 21-25 _____ 26-30 _____ over 30

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PERSONAL EXPERIENCE WITH ETHNIC DIVERSITY (circle all that apply):
Note: This refers to experiences with people from different countries/cultures than yours. They may or may not be of the same race as you (i.e. You both are White, but you are from American, they are from Sweden, etc).

Insignificant  Some experience  High than average  Extensive

Mostly Negative  Mostly Positive  Neutral  Don’t Recall

PERSONAL EXPERIENCE WITH RACIAL DIVERSITY (circle all that apply):
Note: This refers to experiences with people from different races than yours. They may or may not be from the same country as you (i.e. You both are American, but you Black, they are Asian, etc).

Insignificant  Some experience  High than average  Extensive

Mostly Negative  Mostly Positive  Neutral  Don’t Recall

DIRECT EXPOSURE TO GAY/LESBIAN INDIVIDUALS (circle all that apply):

No exposure  Personal Friend(s)  Relative(s)  Professional Contact(s)

Neighbor(s)  Authors/Writers/Texts  Media  Other(s): ___________

HOW MANY COURSES HAVE YOU TAKEN WHICH DISCUSSED MULTICULTURAL THEMES OR TOPICS (Indicate number): __________

HAVE YOU PARTICIPATED IN ANY CULTURAL/CROSS-CULTURAL EXPERIENCES (Please circle all that apply):

Foreign (vacation) travel  YES  NO
Domestic (vacation) travel  YES  NO
Work/School in another country  YES  NO
Peace Corps volunteer/staff  YES  NO
Vista volunteer/staff  YES  NO
Inner-city program volunteer/staff  YES  NO

Other (Please list and briefly describe below): ____________________________

_________________________________________________________________

______________________________________________________________

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STUDENTS' MATH FUNCTIONING: Please use the following definitions in responding to the questions regarding the math classes you have taught during the last semester (or marking period):

Strongest class refers to the class where your students have performed the best as evidenced by the highest mean score among all your classes.

Weakest class refers to the class where your students have performed the worst as evidenced by the lowest mean score among all your classes.

How many math classes have you taught this last semester (or marking period)?
____________

What is the average size of your math classes? ___________

What is the average math score (in percentage points) of your strongest math class?
___________ %

What is the grade level for the class above? Circle one. 6th 7th 8th

What is the average math score (in percentage points) of your weakest math class?
___________ %

What is the grade level for the class above? Circle one. 6th 7th 8th
## Operationalization of the Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Conceptual definition</th>
<th>Instrument definition</th>
<th>Operational definition</th>
</tr>
</thead>
</table>
| 1. Gender                     | Belonging to a group based on typical sexual characteristics; being of the male or female sex | This variable was determined by the respondent selecting one of the following categories:  
  ___ Female  
  ___ Male | The responses were categorized by a nominal scale as follows:  
  1 female  
  2 male |
| Data label: Gender            |                                                                                         |                                                                                        |                                                                                        |
| 2. Ethnic background          | Belonging to a group based on racial and/or ethnic background; being of a particular race or ethnicity | This variable was determined by the respondent selecting one of the following categories:  
  ___ Black/African  
  ___ White/European  
  ___ Asian  
  ___ Hispanic/Latino  
  ___ Middle Eastern  
  ___ Mixed/Biracial  
  ___ Native/Indigenous  
  ___ Other: __________ | The responses were categorized by a nominal scale as follows:  
  1 Asian descent  
  2 Black/African descent  
  3 Hispanic/Latino  
  4 Native/Indigenous  
  5 White/European  
  6 Middle Eastern  
  7 Mixed Ethnicity/Biracial  
  8 Other |
| Data label: Ethnic            |                                                                                         |                                                                                        |                                                                                        |
| 3. Years teaching             | Amount of time employed in the teaching profession                                     | This variable was determined by the respondent selecting one of the following categories:  
  ___ 1-5 years  
  ___ 6-10 years  
  ___ 11-15 years  
  ___ 16-20 years  
  ___ 21-25 years  
  ___ 26-30 years  
  ___ over 30 years | The responses were categorized by a nominal scale as follows:  
  1 1-5 years  
  2 6-10 years  
  3 11-15 years  
  4 16-20 years  
  5 21-25 years  
  6 26-30 years  
  7 30+ years |
| Data label: Teaching          |                                                                                         |                                                                                        |                                                                                        |
Table A1 – Continued.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Conceptual definition</th>
<th>Instrument definition</th>
<th>Operational definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Grade level taught</td>
<td>Grade level the respondent currently teaches</td>
<td>This variable was determined by the respondent selecting one of the following categories:</td>
<td>The responses were categorized by a nominal scale as follows:</td>
</tr>
<tr>
<td>Data label: Grade</td>
<td></td>
<td>___ 5th grade</td>
<td>1 5th grade</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ 6th grade</td>
<td>2 6th grade</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ 7th grade</td>
<td>3 7th grade</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ 8th grade</td>
<td>4 8th grade</td>
</tr>
<tr>
<td>5. Socioeconomic level</td>
<td>Childhood socioeconomic class background as experienced by the respondent</td>
<td>This variable was determined by the respondent selecting one of the following categories:</td>
<td>The responses were categorized by a nominal scale as follows:</td>
</tr>
<tr>
<td>Data label: Ses</td>
<td></td>
<td>___ poor/lower</td>
<td>1 poor/lower</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ working</td>
<td>2 working</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ middle</td>
<td>3 middle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ upper middle</td>
<td>4 upper middle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ elite/wealthy</td>
<td>5 elite/wealthy</td>
</tr>
<tr>
<td>6. Education level completed</td>
<td>Current educational level completed by the respondent; highest degree completed</td>
<td>This variable was determined by the respondent selecting one of the following categories:</td>
<td>The responses were categorized by a nominal scale as follows:</td>
</tr>
<tr>
<td>Data label: Degree</td>
<td></td>
<td>___ undergraduate</td>
<td>1 undergraduate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ masters</td>
<td>2 masters</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ specialist</td>
<td>3 specialist</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ doctorate</td>
<td>4 doctorate</td>
</tr>
<tr>
<td>7. Level of ethnic diversity</td>
<td>Respondents amount of experience with people from different countries and/or cultures</td>
<td>This variable was determined by the respondent selecting one of the following categories:</td>
<td>The responses were categorized by an ordinal scale as follows:</td>
</tr>
<tr>
<td>exposure</td>
<td>and/or cultures than their own</td>
<td>___ insignificant</td>
<td>1 insignificant</td>
</tr>
<tr>
<td>Data label: DiversEA</td>
<td></td>
<td>___ some experience</td>
<td>2 some experience</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ higher than average</td>
<td>3 higher than average</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ extensive</td>
<td>4 extensive</td>
</tr>
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</table>
Table A1 – *Continued.*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Conceptual definition</th>
<th>Instrument definition</th>
<th>Operational definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Impact of Ethnic diversity exposure</td>
<td>Respondents impression of any experiences with people from different countries and/or cultures than their own</td>
<td>This variable was determined by the respondent selecting one of the following categories:</td>
<td>The responses were categorized by a ordinal scale as follows:</td>
</tr>
<tr>
<td>Data label: DiversEB</td>
<td></td>
<td>___ mostly negative</td>
<td>1 don’t recall</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ mostly positive</td>
<td>2 mostly negative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ neutral</td>
<td>3 neutral</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ don’t recall</td>
<td>4 mostly positive</td>
</tr>
<tr>
<td>9. Level of racial diversity exposure</td>
<td>Respondents amount of experience with people of a different race than their own</td>
<td>This variable was determined by the respondent selecting one of the following categories:</td>
<td>The responses were categorized by an ordinal scale as follows:</td>
</tr>
<tr>
<td>Data label: DiversRA</td>
<td></td>
<td>___ insignificant</td>
<td>1 insignificant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ some experience</td>
<td>2 some experience</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ higher than average</td>
<td>3 higher than average</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ extensive</td>
<td>4 extensive</td>
</tr>
<tr>
<td>10. Impact of racial diversity exposure</td>
<td>Respondents impression of any experiences with people of a different race than their own</td>
<td>This variable was determined by the respondent selecting one of the following categories:</td>
<td>The responses were categorized by a nominal scale as follows:</td>
</tr>
<tr>
<td>Data label: DiversRB</td>
<td></td>
<td>___ mostly negative</td>
<td>1 don’t recall</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ mostly positive</td>
<td>2 mostly negative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ neutral</td>
<td>3 neutral</td>
</tr>
<tr>
<td></td>
<td></td>
<td>___ don’t recall</td>
<td>4 mostly positive</td>
</tr>
<tr>
<td>11. No exposure to gay/lesbian individuals</td>
<td>Respondents exposure to gay/lesbian individuals</td>
<td>This variable was determined by the respondent selecting the choice of ‘no exposure’ when asked about their direct exposure to gay/lesbian individuals</td>
<td>The responses were categorized by a nominal scale as follows:</td>
</tr>
<tr>
<td>Data label: ExposrA</td>
<td></td>
<td></td>
<td>1 no (did not select the choice of ‘no exposure’)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 yes (selected the choice of ‘no exposure’)</td>
</tr>
</tbody>
</table>
Table A1 – Continued.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Conceptual definition</th>
<th>Instrument definition</th>
<th>Operational definition</th>
</tr>
</thead>
</table>
| 12. Gay/lesbian personal friends | Respondents personal friendships with gay/lesbian individuals | This variable was determined by the respondent selecting the choice of ‘personal friend’ when asked about their direct exposure to gay/lesbian individuals | The responses were categorized by a nominal scale as follows:  
1 no (did not select the choice of ‘personal friend’)  
2 yes (selected the choice of ‘personal friend’) |
| Data label: ExposrB | | | |
| 13. Gay/lesbian relative(s) | Respondents family connection to gay/lesbian individuals | This variable was determined by the respondent selecting the choice of ‘relative(s)’ when asked about their direct exposure to gay/lesbian individuals | The responses were categorized by a nominal scale as follows:  
1 no (did not select the choice of ‘relative(s)’)  
2 yes (selected the choice of ‘relative(s)’) |
| Data label: ExposrC | | | |
| 14. Gay/lesbian professional contact(s) | Respondents professional contact with gay/lesbian individuals | This variable was determined by the respondent selecting the choice of ‘professional contact(s)’ when asked about their direct exposure to gay/lesbian individuals | The responses were categorized by a nominal scale as follows:  
1 no (did not select the choice of ‘professional contact(s)’)  
2 yes (selected the choice of ‘professional contact(s)’) |
| Data label: ExposrD | | | |
| 15. Gay/lesbian neighbor(s) | Respondents residential proximity to gay/lesbian individuals | This variable was determined by the respondent selecting the choice of ‘neighbor(s)’ when asked about their direct exposure to gay/lesbian individuals | The responses were categorized by a nominal scale as follows:  
1 no (did not select the choice of ‘neighbor(s)’)  
2 yes (selected the choice of ‘neighbor(s)’) |
<p>| Data label: ExposrE | | | |</p>
<table>
<thead>
<tr>
<th>Variable</th>
<th>Conceptual definition</th>
<th>Instrument definition</th>
<th>Operational definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. Gay/lesbian academic contact</td>
<td>This variable was determined by the respondent selecting the choice of ‘authors/writers or texts’ when asked about their direct exposure to gay/lesbian individuals</td>
<td>This variable was determined by the respondent selecting the choice of ‘authors/writers or texts’ when asked about their direct exposure to gay/lesbian individuals</td>
<td>The responses were categorized by a nominal scale as follows: 1 no (did not select the choice of ‘authors/writers or texts’) 2 yes (selected the choice of ‘authors/writers or texts’)</td>
</tr>
<tr>
<td>Data label: ExposrF</td>
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<tr>
<td>17. Gay/lesbian media contact</td>
<td>Respondents exposure to gay/lesbian individuals in the media</td>
<td>This variable was determined by the respondent selecting the choice of ‘media’ when asked about their direct exposure to gay/lesbian individuals</td>
<td>The responses were categorized by a nominal scale as follows: 1 no (did not select the choice of ‘media’) 2 yes (selected the choice of ‘media’)</td>
</tr>
<tr>
<td>Data label: ExposrG</td>
<td></td>
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<tr>
<td>18. Number of multicultural courses taken</td>
<td>Number of multicultural courses taken by the respondent</td>
<td>This variable was determined by responses to the following question: How many courses have you taken which discussed multicultural themes or topics? Indicate number: ____</td>
<td>The responses showed the number of multicultural courses taken Responses were entered as a numeral (ratio)</td>
</tr>
<tr>
<td>Data label: Courses</td>
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</table>
Table A1 – Continued.

<table>
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<tr>
<th>Variable</th>
<th>Conceptual definition</th>
<th>Instrument definition</th>
<th>Operational definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>19. Foreign (vacation) travel</td>
<td>Respondents participation in the cultural/cross-cultural experience of foreign (vacation) travel</td>
<td>This variable was determined by the respondent selecting the choice of ‘foreign (vacation) travel’ when asked about relevant cultural/cross-cultural experiences</td>
<td>The responses were categorized by a nominal scale as follows: 1 no (did not select the choice of ‘foreign (vacation) travel’) 2 yes (selected the choice of ‘foreign (vacation) travel’)</td>
</tr>
<tr>
<td>Data label: CrossFVT</td>
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<td></td>
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<tr>
<td>20. Domestic (vacation) travel</td>
<td>Respondents participation in the cultural/cross-cultural experience of domestic (vacation) travel</td>
<td>This variable was determined by the respondent selecting the choice of ‘domestic (vacation) travel’ when asked about relevant cultural/cross-cultural experiences</td>
<td>The responses were categorized by a nominal scale as follows: 1 no (did not select the choice of ‘domestic (vacation) travel’) 2 yes (selected the choice of ‘domestic (vacation) travel’)</td>
</tr>
<tr>
<td>Data label: CrossDVT</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>21. Work/school experiences in another country</td>
<td>Respondents participation in the cultural/cross-cultural experience of working or attending school in another country</td>
<td>This variable was determined by the respondent selecting the choice of ‘work/school in another country’ when asked about any relevant cultural/cross cultural experiences</td>
<td>The responses were categorized by a nominal scale as follows: 1 no (did not select the choice of ‘work/school in another country’) 2 yes (selected the choice of ‘work/school in another country’)</td>
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<tr>
<td>Data label: CrossWAC</td>
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199
<table>
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<tr>
<th>Variable</th>
<th>Conceptual definition</th>
<th>Instrument definition</th>
<th>Operational definition</th>
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</thead>
<tbody>
<tr>
<td>22. Peace corps volunteer and/or staff experiences</td>
<td>Respondents participation in the cultural/cross-cultural experience of volunteering or working as a staff member in the Peace Corps.</td>
<td>This variable was determined by the respondent selecting the choice of ‘Peace Corps volunteer/staff’ when asked about relevant cultural/cross-cultural experiences</td>
<td>The responses were categorized by a nominal scale as follows: 1 no (did not select the choice of ‘Peace Corps volunteer/staff’) 2 yes (selected the choice of ‘Peace Corps volunteer/staff’)</td>
</tr>
<tr>
<td>Data label: CrossPCV</td>
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<tr>
<td>23. Vista volunteer/staff experiences</td>
<td>Respondents participation in the cultural/cross-cultural experience of volunteering or working as a staff member of Vista</td>
<td>This variable was determined by the respondent selecting the choice of ‘Vista volunteer/staff’ when asked about any cultural/cross-cultural experiences</td>
<td>The responses were categorized by a nominal scale as follows: 1 no (did not select the choice of ‘Vista volunteer/staff’) 2 yes (selected the choice of ‘Vista volunteer/staff’)</td>
</tr>
<tr>
<td>Data label: CrossVVS</td>
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<tr>
<td>24. Inner-city program volunteer/staff</td>
<td>Respondents participation in the cultural/cross-cultural experience of volunteering or working as a staff member in a inner city program</td>
<td>This variable was determined by the respondent selecting the choice of ‘inner city program volunteer/staff’ when asked about any cultural/cross-cultural experiences</td>
<td>The responses were categorized by a nominal scale as follows: 1 no (did not select the choice of ‘inner city volunteer/staff’) 2 yes (selected the choice of ‘inner city volunteer/staff’)</td>
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<tr>
<td>Data label: CrossIPV</td>
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<tr>
<td>Variable</td>
<td>Conceptual definition</td>
<td>Instrument definition</td>
<td>Operational definition</td>
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<tr>
<td>25. Professional Beliefs About Diversity Score</td>
<td>Survey that measures diversity beliefs from a more specific, professional context focusing on the following diversity issues: (a) race/ethnicity (b) gender (c) social class (d) sexual orientation (e) disabilities (f) language (g) religion And educational contexts: (a) instruction (b) staffing (c) segregation/integration (d) ability tracking (e) curricular materials (f) multicultural verses monocultural education (Pohan &amp; Aguilar, 2001)</td>
<td>This variable was determined by the responses to the following items, on a Likert scale: 1- Strongly Disagree 2- Disagree 3- Undecided/Neutral 4- Agree 5- Strongly Agree Items are listed in Appendix A-2</td>
<td>The responses were tabulated in an interval scale with a range of 25 to 125</td>
</tr>
<tr>
<td>26. Personal Beliefs About Diversity Score</td>
<td>Survey that measures diversity beliefs from a more general, personal position covering the following diversity issues: (a) race/ethnicity (b) gender (c) social class (d) sexual orientation (e) disabilities (f) language (g) immigration (Pohan &amp; Aguilar, 2001)</td>
<td>This variable was determined by the responses to the following items, on a Likert scale: 1- Strongly Disagree 2- Disagree 3- Undecided /Neutral 4- Agree 5- Strongly Agree Items are listed in Appendix A-1</td>
<td>The responses were tabulated in an interval scale with a range of 25 to 125</td>
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<tr>
<td>Variable</td>
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<tr>
<td>27. Teacher diversity belief typology</td>
<td>Categories in which teachers are grouped based on their combined Personal Beliefs About Diversity (PerBADS) and Professional Beliefs About Diversity (ProBADS) scores</td>
<td>This variable was determined by categorizing the individual PerBADS and ProBADS scores within the following typologies:</td>
<td>The responses were categorized by a nominal scale as follows:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Typology 1: low PerBADS, high ProBADS</td>
<td>1 HiPro/LowPer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Typology 2: high PerBADS, high ProBADS</td>
<td>2 HiPro/HiPer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Typology 3: low PerBADS, low ProBADS</td>
<td>3 LowPer/LowPro</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Typology 4: high PerBADS, low ProBADS</td>
<td>4 LowPro/HiPer</td>
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<td>Te typologies were set using the following scores:</td>
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<td>Professional: Low= 65 TO 84</td>
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<td></td>
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<td></td>
<td>High= 85 to 108</td>
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<td></td>
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<td></td>
<td>Personal: Low= 39 to 53</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>High= 54 to 67</td>
</tr>
<tr>
<td>28. Highest average math score</td>
<td>The highest average student mathematics achievement score (ASMA) determined by averaging the final percentage based scores of all students in a particular class</td>
<td>This variable was determined by the respondents answers to the following question:</td>
<td>The responses showed average percentage points</td>
</tr>
<tr>
<td>Data label: HiMath</td>
<td>What is the average math score (in percentage points) of your strongest math class ______</td>
<td>Responses were entered as numerical</td>
<td></td>
</tr>
<tr>
<td>29. Lowest average math score</td>
<td>The lowest average student mathematics achievement score (ASMA) determined by averaging the final percentage based scores of all students in a particular class</td>
<td>This variable was determined by the respondents answers to the following question:</td>
<td>The responses showed average percentage points</td>
</tr>
<tr>
<td>Data label: LoMath</td>
<td>What is the average math score (in percentage points) of your weakest math class ______</td>
<td>Responses were entered as numerical</td>
<td></td>
</tr>
</tbody>
</table>
MEMORANDUM

TO: Xiomara Romine Dr. Vicki Petzko
    IRB # 09-094
FROM: Lindsay Pardue, Director of Research Integrity
      M. D. Roblyer, IRB Committee Chair
DATE: November 2, 2009
SUBJECT: IRB# 09-094: The Relationship of Personal and Professional Teacher Diversity Typologies to Average Student Mathematics Achievement in Middle Schools Serving the Diverse Populations of North Georgia

The UTC Institutional Review Board has reviewed and approved your application contingent upon the following:

➢ Please obtain and submit to the IRB the permission of the principals at the schools where you will be conducting research. At this time, you may proceed with your research only at Dalton Middle, New Hope Middle, and Valley Point Middle, since we have received the permission letters from those principals. As you submit the permission letters from the remaining principals, you may proceed with your research in those schools as well.

Please submit a copy of the requested documents to instrb@utc.edu before proceeding with your research.

You must include the following approval statement on research materials seen by participants and used in research reports:

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project # 09-094.

Since your project has been deemed exempt, there is no further action needed on this proposal unless there is a significant change in the project that would require a new review. Changes that affect risk to human subjects would necessitate a new application to the IRB committee immediately.

Please remember to contact the IRB Committee immediately and submit a new project proposal for review if significant changes occur in your research design or in any instruments used in conducting the study. You should also contact the IRB Committee immediately if you encounter any adverse effects during your project that pose a risk to your subjects.

For any additional information, please consult our web page http://www.utc.edu/irb or email instrb@utc.edu
VITA

Xiomara Reid Romine obtained a Bachelors of Art degree from the University of Tennessee, Chattanooga, in 2001 with a concentration in Graphic Design. After graduation, she became interested in the field of education and obtained a Masters of Education degree from the University of Tennessee, Chattanooga, in 2004. After working in education for several years as a teacher, Xiomara decided to pursue a leadership degree in education. This ultimately led to a Post Masters Certificate in School Leadership and Administration in 2007 and an Ed.D. in Leadership and Learning in 2010 from the University of Tennessee, Chattanooga. From 2005-2007, she participated in the Dalton public Schools Leadership Academy and served on several committees including the Teacher Induction Task Force, Dalton Middle School Visioning Team, Quality Improvement Council and Extra Help Committee. She has held various positions including substitute teacher, teaching assistant, paraeducator, graduate assistant, freelance designer/artist and art teacher.