The Use of Multiple Intelligence Concepts with Middle School Students and Future Academic Achievement

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THE USE OF MULTIPLE INTELLIGENCE CONCEPTS WITH MIDDLE SCHOOL STUDENTS AND FUTURE ACADEMIC ACHIEVEMENT

by

Christa Fountain Glenn

Abstract of a Dissertation
Submitted to the Graduate School of The University of Southern Mississippi in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

May 2010
ABSTRACT

THE USE OF MULTIPLE INTELLIGENCE CONCEPTS WITH MIDDLE SCHOOL STUDENTS AND FUTURE ACADEMIC ACHIEVEMENT

by Christa Fountain Glenn

May 2010

This quantitative quasi-experimental study examined the variables of student’s grade point averages when Multiple Intelligences were introduced and implemented in a study in 2007. To examine this information, in 2007 a study was conducted of 115 eighth grade students from a single grade school in the southern United States. At the conclusion of the study in 2007, it was the researchers’ belief that students may possibly utilize the Multiple Intelligences in their upcoming years as high school students, therefore, the study continued and the academic achievement by way of grade point averages of 94 of the original students now ending their 10th grade year were examined and analyzed in 2009. This longitudinal study sought information as to how students implemented and utilized Multiple Intelligences over an extended period of time and if there was an increase or decrease in academic performance.

The research sought to discover whether or not there was a significant relationship between student achievement determined through GPAs and Multiple Intelligences. By utilizing a second single sample t-test, a significant relationship was discovered between the variables of GPAs and Multiple Intelligences. Ancillary findings in the study revealed those students’ grade point averages increased by an adjusted mean of .233 over the course of a two year time frame, and the increase is thought to be due in part to the introduction and implementation of Multiple Intelligences.
Recommendations for educators and policy makers include but are not limited to, facilitation of staff development for colleagues in hopes that more educators will realize the effectiveness of these strategies and techniques when they are implemented in their classrooms; the researcher also plans to provide mentorship to fellow educators and implement Multiple Intelligences in other U.S. History teachers’ classes; also to implement the inclusion of an internet blog of a reflective journal to note what techniques were successful in lesson implementation and which were not for not only the educators within the school district, but for all educators to peruse. By providing an introduction and examples of implementation of Multiple Intelligences incorporation into an 8th grade History classroom, other educators interest may spark and possibly become more cognizant of these successful strategies and possibly begin implementation of them into their own classrooms. These cost effective Multiple Intelligence strategies have been a factor in increasing academic achievement and are still present over a two year span in students.

Future recommendations for the study are that similar studies be repeated over several years, as long term data could possibly increase the validity and reliability for future researchers in the field of Multiple Intelligences. With this study including data readily available, the researcher plans to inform the district superintendent and the state of Mississippi Department of Education superintendent of these findings in hope of implementing Multiple Intelligences within the district first, then at a state level, and possibly nationwide. It is this researcher’s desire that the knowledge of Multiple Intelligences will be infectious and motivate others to seek beyond the familiar methods of educating the youth of today and the future of tomorrow.
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TABLE OF CONTENTS

ABSTRACT.............................................................................................................................................. ii

ACKNOWLEDGMENTS ......................................................................................................................... iv

LIST OF ILLUSTRATIONS.................................................................................................................. vii

LIST OF TABLES............................................................................................................................... viii

CHAPTER

I. INTRODUCTION......................................................................................................................... 1

Statement of the Problem
Purpose of the Study
Statement of Hypotheses
Definitions of Terms
Delimitations
Justification of the Study

II. REVIEW OF RELATED LITERATURE .................................................................................. 9

Curriculum
Curriculum Development
Gender Differences
Accommodating Differences
Curricular Structure
Reform through the Years
Assessment
Assessment Development
Assessment Possibilities
Budgetary Reasoning
History Matters
Howard Gardner and Multiple Intelligences
Multiple Intelligences Theory and the Appeal Factor for Educators
MI Schools Across the United States
MI Criticisms
MI around the World

III. METHODOLOGY .................................................................................................................. 56

Overview
Research Design
Participants
Instrumentation
LIST OF ILLUSTRATIONS

Figure

1. Comparison of student involvement over 2 year time period................................69
LIST OF TABLES

Table

1. 7th Grade Final Averages in Core Classes and Total GPA .................................65
2. Comparison of GPA’s over the course of 1 year ................................................66
3. 10th grade Final Averages in Core Classes and Total GPA .................................67
4. Descriptive Statistics of Comparison of 8th and 10th grade Adjusted Means ...... 68
5. Absences 9th grade, Absences 10th grade ..........................................................70
6. AP Classes, Art, Music, Special Education (SPED), Theatre .............................71
7. Ethnicity, Gender .................................................................................................72
8. Military, Tuition .....................................................................................................73
9. Sports, Physical Education (P.E.) in 10th grade ....................................................73
10. Resides with 1 parent, Resides with 2 parents, SES Status ...............................74
11. Mother’s education level, Father’s education level ............................................76
12. Family make up changes since 8th grade ............................................................77
13. Activities in 8th grade, Activities in 9th grade, Activities in 10th grade ..............78
14. Students remember learning MI in 8th grade, Students used MI in 8th grade, Students application of MI since 8th grade .........................................................79
CHAPTER I
INTRODUCTION

With all the money, time, and effort that have been spent on educational reform attempts since the origin of education, why have districts, states, legislators, and presidents not found a more productive method of educating today’s children? The incorporation of the Multiple Intelligences (MI) theory would be cost effective, as the only funding necessary would be for additional supplies and teacher and administrator training. Teaching to a child’s needs seems much more effective in producing a life-long learner than teaching to a test. Education today has more funding, more resources, and more guidelines and rules directing its educational programs. Yet data concludes that there are not better test results. Drop-out rates are steadily increasing and test scores are at a lower percentage than ever before.

In this data-driven world, success in one’s career or personal life may not be easily attainable. However, all people possess the ability to achieve triumph at differing levels. Educational theorist Howard Gardner may have found a method of educational success for students in today’s society. According to Gardner (1983), each person has facets of his or her brain that are stronger than others; therefore, all people have the capability to learn and be successful at varying rates. Educators today base student learning primarily on intelligence quotients (IQs), numerical grades, and state test scores.

In Europe during the early 1800s, the education of young males around the age of 7 began when they were sent to learn from master craftsmen. There was no written test that these young men had to take and pass before they were deemed worthy of a career, much unlike children today. These young men were tested but in a different manner. When the craftsman felt the young man had accurately learned the craft, the master would then
assess the boy’s progress. If the young man could replicate his knowledge in the form of manufacturing an item, that was all that was necessary. There was no assignment of numerical data as a form of assessment. Yet, in retrospect, these young men were able to make an honest living for themselves and often for their wives and children (Sperber, 2005). Gardner, like most educators, recognizes that society has since evolved. Nearly every aspect of today’s society is data-driven. Many jobs, salaries, promotions, and education levels are based upon the ability to achieve a numerical score. According to Gardner (1983), as all facets of education evolve, curriculum and assessment should be similarly progressive.

Statement of the Problem

One statement of the problem was to examine the possibility that teaching eighth grade U.S. History students through the use of Multiple Intelligences may predict academic achievement of students at the end of their tenth grade school year. Another requirement was to examine if age, socioeconomic status, ethnicity, family composition, and non-school related activities affected students’ interests between grades 8 and 10.

Purpose of the Study

The general purpose of this study was to determine what, if any, effect Multiple Intelligences had on academic achievement. The researcher gathered data and examined if the specific participants’ tenth grade GPAs decreased or increased each year over 2 school years since implementation of the Multiple Intelligences strategy in eighth grade and what factors may have influenced the decrease/increase.

Statement of Hypotheses

The hypotheses were as follows:
Ho1: There will be no statistically significant difference among specific students at the end of their 8th and 10th grade school years with regard to grade point averages (GPAs).

Ho2: There will be no statistically significant difference among specific students’ involvement in music, athletics, choir, and drama at the end of their eighth and tenth grade school years, respectively.

Definition of Terms

For the purpose of this study, there are terms that should be understood in context as to their relationship with U.S. History and Multiple Intelligences. The terms, along with definitions and concepts, are provided in the context in which they were studied.

*Annual Yearly Progress (AYP)* – Primarily utilizes academic assessments to measure the progress of public schools, districts, and states and includes separate measurable annual objectives for the continuous and significant growth for each of the identified sub-groupings within.

*Children First Act* – what should be in a district’s annual report card and requires that all districts publish their report cards in their local newspapers as well as on their Web sites in a printable format.

*Core-classes* – basic curriculum classes which are required by the state to achieve state standards.

*Differentiated Instruction* – refers to a variety of classroom practices that accommodate differences in students’ learning styles, interests, prior knowledge, socialization needs, and comfort zones (Brody, 1999).

*Educational Excellence for All Children Act (EEACA)* – focused on programs and procedures to ensure improvement in many areas of education.
*Education Reform Act (ERA)* – implementation of the current public school accreditation model and accountability system.

*Elementary and Secondary Education Act (ESEA)* – implemented accountability into education to increase achievement of poverty stricken and special needs students.

*Goals 2000: Educate America Act* – strategy to raise standards with the premise of guaranteeing that students would be more stringently monitored for results of successful student achievement.

*GPA* – acronym for grade point average.

*Intelligence* – the ability to solve problems; a biophysical potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture through which individuals are able to learn/teach new information (Gardner, 1999a).

*Improving America’s Schools Act (IASA)* – strategy to raise standards with the premise of guaranteeing that students would be more stringently monitored for results of successful student achievement.

*IQ* – acronym for Intelligence Quotient – when intelligence is conventionally defined by a single number (Brody, 1999).

*Kentucky Education Reform Act (KERA)* – state of Kentucky’s reformation of the educational process.

*Kaiser-Meyer-Olkin (KMO)* – varimax procedure used to provide a measure of sampling adequacy and determine if questions need to be deleted.

*MDE* – acronym for Mississippi Department of Education.

*Meme* – a unit of meaning.

*MI* – acronym for Multiple Intelligences (Gardner, 1983).
Minimum Competency Test (MCT) – The standardized test used in the state of Mississippi to assess student achievement in mathematics and English.

Mississippi Alternate Assessment of Extended Curriculum Frameworks (MAAECF) – high school assessment based on alternate academic achievement standards.

Mississippi Student Achievement Act (MSAA) – implementation of evaluations to improve the educational system by establishing growth models and performance classification levels to identify schools that had previously not met student achievement standards.

Mississippi Subject Area Testing Program (MSATP) – high school assessment based on alternate academic achievement standards.

Multiple Intelligences – based on the belief that all individuals possess at least eight unique intelligences (Gardner, 1983).

NAEP – acronym for National Assessment of Educational Progress.

NCES – acronym for National Center for Education Statistics


NEGP – acronym for National Educational Goals Panel.

No Child Left Behind (NCLB) – Federal legislation signed into law in January of 2002 which mandates state governments to establish procedures to measure student academic achievement and growth and address levels of proficiency where applicable.


Pedagogy – the art or profession of teaching.

Project SUMIT – acronym for Schools Using Multiple Intelligences Theory.

Quasi-experimental – explore causality or causal relationships.
Reliability – refers to the consistency of a test’s result over a period of time and is usually determined by using one or more of the following methods: test-retest, equivalent form, and split-half.

SSI – acronym for Statewide Systemic Initiatives.

Teele Multiple Intelligences Inventory (TIMI) – inventory used to determine levels of Multiple Intelligences present.

TIMSS – acronym for the Trends in International Mathematics and Science Study.

Validity – refers to the degree to which a test measures its intended attributes or desired outcomes.

Delimitations

This research study has a limited population from which information was obtained. This information was drawn from the records of one educator’s eighth grade classes from a small southeastern state and consists of 94 students who have completed the objectives according to the state of Mississippi Department of Education. This study was conducted at an urban public school in the South and was limited to six eighth grade U.S. History classes. The final limitation within this study was the number of students present for a short amount of time due to military re-location, as a military base is in close proximity to the school in which the study was conducted.

Conclusions drawn from this research study may also be limited by the scope and breadth of the research sources examined and contained in the research base of the proposed study. Inherent limitations may exist in the study in that there may be other research and data that may have a strong influence upon the research findings but are unknown to the researcher at the onset of the investigation. This fact seems to be the case...
in all research, such that one cannot account for what is unknown before the fact (Daniel & Terrell, 1995).

Justification of the Study

There is no denying that public education in America has undergone dramatic change in recent years. Following the major reformations in American education in the past two decades, the federal government stepped in with several changes and reform acts to be implemented in order to increase student performance and productivity, yet test scores and drop-out rates are still not declining. The most striking concept of legislation is its emphasis on greater levels of accountability for schools in relation to student achievement. Although the factors related to student achievement vary greatly, the responsibility lies heavily on the institutions of public education to examine and analyze and utilize these data in order to best serve the educational needs of the students.

There are numerous variables that must be taken into consideration when addressing the issue of student academic performance and growth. Research points to issues connected to variables such as gender, age, learning styles, instructional styles, and economic standing (MDE, 2008a). While all of these variables may or may not influence student achievement, this study sought to examine the variable of the Multiple Intelligences theory and its connection to student achievement. With education in need of great reform, the major goal of this study was to possibly produce knowledge of students’ strengths and weaknesses and draw upon them in various ways that would benefit the participating students, their families, future organizations, programs, and communities, as well as the educational realm. By utilizing Multiple Intelligences in the classroom, students may become more productive learners. Data compiled in this study could
possibly provide a solid learning base for future educational decisions with regards to the curriculum and how teachers teach.

In many states, including the one utilized in this study, school accreditation levels and standings heavily hinge upon student success, mainly on state standardized tests. One must also take into consideration the heavy accountability levied on schools by No Child Left Behind (NCLB) legislation and the importance of both attendance and test scores in their relationship to calculating if a school is making annual yearly progress (AYP).

Educators have undergone numerous changes and reforms for the sake of progress, yet, one may question if the efforts have been put into exploring the Multiple Intelligences theory to the fullest extent. With the many reforms previously integrated into public educational systems, why not try Multiple Intelligences?
CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter deals specifically with the pedagogy of collected literature and select Multiple Intelligences studies conducted and implemented in the classroom. Numerous teaching techniques that have come and gone over the past decades in the classroom setting are explored in this chapter. The many reformations as well as the legislation to improve education that has taken place over the past century are also included. Gardner’s (1983) Multiple Intelligences integrated in a classroom setting within the United States and around the world is also explored in this study.

Curriculum

Curriculum emphasizes that a school system must be viewed as more than the mere sum of its parts but rather in its entirety as an educational program. During the last 100 years a set of principles, theories, and approved practices has emerged in education (Erickson, 1995). Focusing on the social, historical, and professional foundations of curriculum theory and development, this study recognizes the vitality of building upon the legacy of previous curriculum.

One of the single most powerful tools in schools today is curriculum. Students must be held accountable for their actions. A state curriculum is one way to ensure that all students are learning the appropriate material at the appropriate time. “From Thomas Jefferson to Horace Mann and down to recent times, public school education has in part been conceived as a mechanism for attaining a more fully participatory democratic society – a way to equalize opportunities for personal advancement” (Schubert, Schubert, Thomas, & Carroll, 2002, p. 88).
Curriculum is what educators teach. How they teach it is often left up to the individual classroom teacher, which leaves room for variation in teaching style. This also assists in meeting the various needs of the students within the classroom. By using Multiple Intelligences, one is able to identify strengths and weaknesses to foster both academic and personal growth. When one understands uniqueness, one can be effective (Erickson, 1995).

**Curriculum Development**

Curriculum development involves choices that are influenced by many factors such as societal expectations, learning and developmental theories, legislative and court decisions, state mandates, and community and individual pupil needs. At the same time, curriculum reflects common assumptions about the purpose of education. In a more practical sense, curriculum is the structure or basic organization for translating visionary aspects of a plan into actual experiences for the learner. Wiles and Bondi (1993) identified a basic four-step cycle for the structure of curriculum development process: (a) analyze, (b) design, (c) implement, and (d) evaluate. By implementing this four-step cycle, the outcome is to produce the most effective learner possible. Gardner’s theory of Multiple Intelligences incorporates this cycle technique in the development of the whole-child.

Changes in curriculum stem primarily from judicial actions being brought about and are often driven by external forces. An example is the Kentucky Education Reform Act (KERA) of 1990. This was a landmark case for the state of Kentucky in reforming the state’s educational process. The state board felt a major change was necessary to improve student achievement and ensure success. Another example is the Smith-Hughes Act which was invoked by President Woodrow Wilson in early 1914 and was also known as
the Vocational Act of 1917. This act represented the first national approval of vocational education in public schools, as a need for a more accommodating educational plan was a necessity for some (Prentice Hall Documents Library). The Commission on National Aid to Vocational Education used data from the 1910 Census Report to stress the need for vocational education, stating that over 12,000,000 males and females in the United States were engaged in agriculture and over 14,000,000 were engaged in manufacturing. The report further stated it was probable that less than 1% of these individuals had adequate training (Smith, 1999). Education was required for individuals who desired training in a chosen vocational area as well as those who were employed and sought additional training for improvement or advancement (Scott & Sarkees-Wircenski, 1996). The Smith-Hughes Act gave vocational education a place in the public school (Howard & Rice-Crenshaw, 2006). John Dewey proved his stance on reforming leadership during the Progressive reform of the 1950s by supporting vocational education (Lauderdale, 1987).

The public continually demands results from the educational system. Parents are, after all, sending their best resources to be educated by schools, and they expect positive results. It is, however, not often an easy task to convince these decision makers of the importance of curriculum. Educators must not raise frustration levels; instead, they must raise expectations (Erickson, 1995). Society today is a very result-oriented and data-oriented society; therefore, all changes in curriculum and assessment should be based upon research. Many people do not like change; however. Oftentimes it is a necessity to keep up with the continual progress in the educational realm. Coburn (1996) inferred when delineating which comes first, the teachers or the curriculum, that it was evident that teachers must be trained and information must be provided prior to necessary curriculum reformations. According to Erickson (1995), the single most motivating factor
is new leadership, and the best way to cope with change is cooperation. Increased performance can result from actions and ideas. Erickson’s theory is that new leadership brings about new ideas and relieves obligation to the old organizations while emerging into new trends, practices, and motivational techniques. Change in curriculum first seemed to come about as a result of the general public’s need to know what schools were doing as far as educating children. In short – accountability.

State legislatures and policymakers can articulate the accomplishments they want for today’s youth; however, until those words are turned into actions, they will hardly ever be more than simply just words. Results from the Trends in International Mathematics and Science Study (TIMSS) in conjunction with the National Assessment of Educational Progress (NAEP) describe how the widening fissure between the recent student achievement and the desired performance continues to spread (U.S. Department of Education, 2007). The results show that until reformation takes hold and possesses staying power, education will be left to the routine, seemingly unproductive, process (Webb, 2007). TIMSS and NAEP both conclude that American students are performing at much lower standards than those established in recent years in many states (Johnson, 1992). NAEP, commonly referred to as “The Nation’s Report Card,” is conducted by the U.S. Department of Education using a large, representative national sample of American students. NAEP is the only way to measure national trends in boys’ and girls’ academic achievements over long periods of time. Of the two NAEP tests given, one has specifically tracked students’ performance in reading, math, and other has tracked the remaining academic subjects since the early 1990s in the U.S. Tests are conducted in grades four, eight, and twelve. The “long-term trend NAEP” has tracked student performance since the early 1970s and tests students at ages 9, 13, and 17. In fact, the
most recent main NAEP assessment in reading, administered in 2005, does not support the notion that boys’ academic achievement is falling. In fact, fourth-grade boys did better than they had done in both the previous NAEP reading assessment, administered in 2003, and the earliest comparable assessment, administered in 1992. Scores for both fourth grade and eighth grade boys have fluctuated over the past decade, but results suggest that the reading skills of fourth and eighth grade boys have improved since 1992.

TIMSS, although primarily used within math and science, examined the goals and practices of educational practices and systems worldwide. The most recent main NAEP data for 12th-graders dates back to 2002. On that assessment, 12th grade boys did worse than they had in both the previous assessment, administered in 1998, and the first comparable assessment, administered in 1992. At the 12th grade level, boys’ achievement in reading does appear to have fallen during the 1990s and early 2000s.

Boys of all ages are scoring as high as or higher in math than ever before. From 1990 through 2005, boys in grades four and eight improved their performance steadily on the main NAEP, and they scored significantly better on the 2005 NAEP than in any previous year. Twelfth graders most recent math NAEP was given in 2000. Results showed that 12th grade boys did better than they had in 1990 and 1992, but worse than they had in 1996. Both 9 and 13 year-old boys improved gradually on the long-term NAEP since the 1980s (9-year old boys’ math performance did not improve in the 1970s). Seventeen-year-old boys’ performance declined through the 1970s, rose in the 1980s, and remained relatively steady during the late 1990s and early 2000s. In correlation with Gardner’s Multiple Intelligences, TIMSS derived that males in 75% of the 41 countries with data from the eighth grade did significantly better than females in science. In mathematics, males led about 15% of the nations tested. Females led in interpersonal skills, but no
actual number data were produced. Both were strong in the bodily/kinesthetic area (Mullis, Martin, & Foy, 2008). By integrating Gardner’s Multiple Intelligences within the classroom, the much-needed educational transformation may be possible.

Gender Differences

Many differences exist in the public school education of males and females. Gender differences were the focus of Catsambis’s 1994 study in the field of science achievement and attitudes in the middle grades. Data were comprised from a large eighth grade population. Results indicated that female students were comparable with male students in science achievement tests, grades, and course enrollments; some were even higher than their male counterparts, yet findings showed that females possessed a less positive attitude toward science and were less aspired to pursue a career in science than males.

Gender differences in mathematics test performance have been documented extensively by researchers such as Gallagher (1998) and Thorndike (1971), and the data indicates that males perform more successfully in the area of mathematics. Data concludes male performance is generally staying the same or increasing in absolute terms. Girls generally outperform boys in reading at all three grade levels assessed on the main NAEP (Perie, Grigg, & Donahue, 2005). The gaps between girls and boys are smaller in fourth grade and get larger in eighth and 12th grades. Girls also outperform boys in writing at all grade levels. In math, boys outperform girls at all grade levels, but only by a very small amount. Boys also outperform girls again, slightly in science and by a slightly larger margin in geography.

Recent studies conclude there are a substantial percentage of boys who have been diagnosed with disabilities. Halpern (2000) states there are more boys diagnosed with ADHD than girls, with recent estimates of ratios ranging from 2:1 to 6:1. Boys make up
two thirds of students in special education and boys are two and a half times as likely as girls to be diagnosed with attention deficit hyperactivity disorder (ADHD). The number of boys diagnosed with disabilities or ADHD has exploded in the past 30 years, presenting a challenge for schools and causing concern for parents. But the reasons for this growth are a complicated mix of educational, social, and biological factors (Halpern, 2000). Also according to Halpern, experts have hypothesized an explanation for the observed gender difference, one of which is a bias may exist that under identifies ADHD in girls. This is stated to be a product of documented global deficits in boys with ADHD. Such examples are having difficult time processing information, holding information on line, estimating time, and stopping a behavior once started may not extrapolate to girls.

There have been numerous studies conducted of the physical and mental traits in boys and girls from ages 6 to 17, also. In addition to the main and long-term NAEP assessments conducted in reading and math, the NAEP also administers assessments in civics, geography, science, U.S. history, and writing. The civics assessment has not been administered since 1998, but the geography and U.S. history assessments were both administered in 1994 and 2001; the writing assessment in 1998 and 2002; and the science assessment in 1996, 2000, and 2005. In geography, there was no significant change in boys’ achievement at any grade level from 1994 to 2001. In U.S. History, fourth and eighth grade boys improved their achievement, but there was no significant change for 12th grade boys. In writing, both fourth and eighth grade boys improved their achievement from 1998 to 2002, but 12th grade boys’ achievement declined. In science, fourth grade boys’ achievement in 2005 improved over their performance in both 1996 and 2000, eighth grade boys showed no significant change in achievement, and 12th grade boys’ achievement declined since 1996. Females generally score higher in linguistic and
interpersonal categories; whereas males score higher in the areas of science and mathematics.

Educational differences in boys and girls have long been an issue, partly due to the disadvantages within education and society. A clear picture for a long time has been that low-income, minority, and females consistently fall short of their affluent, white, and male counterparts. Throughout time, women have been often been referred by men as the inferior sex. Stotsky (2009) has conducted extensive research of the differences in males and females. However, in European culture during the 2nd century BCE women were the major deities. There are a variety of theories as to why this changed. Some believed that with evolution women lost their place in productive, social and cultural life and their worth sank along with their former status (Reed, 1975). DeBeauvoir (1964) felt change occurred when it was established that men as well as women were involved in the reproductive process.

According to DeBeauvior, Napoleon stated: "Woman is our property; we are not hers because she produces children for us — we do not yield any to her. She is therefore our possession as the fruit tree is that of the gardener." Researchers have also used women’s reproductive capacity to conclude women's intellectual inferiority (Reed, 1975). During the 13th Century, it was noted by Stotsky (2009) that St. Thomas Aquinas stated about women:

As regards the individual nature, woman is defective and misbegotten, for the active force in the male seed tends to the production of a perfect likeness in the masculine sex; while the production of woman comes from defect in the active force or from some material indisposition, or even from some external influence, such as that of a south wind, which is moist….(p.2)
During the eighteenth and nineteenth centuries, a wide variety of thinkers, including Mary Wollstonecraft, J. S. Mill, Charlotte Perkins Gilman, and Elizabeth Cady Stanton, addressed topics related to “women's morality.” Questions were raised such as: Are women's “feminine” traits the product of nature/biology or are they instead the outcome of social conditioning? Are moral virtues as well as gender traits connected with one's affective as well as cognitive capacities, indeed with one's physiology and psychology? Should we simply accept the fact that men and women have different moral virtues as well as different gender traits and proceed accordingly? Should men and women adhere to the same morality? Wollstonecraft denied that women are doomed by nature to be less virtuous than men (Wollstonecraft, 1792). Wollstonecraft also emphasized that women of her times needed a better education. It was implied by her that the purpose of educating women was to supply men with “rational fellowship”, that is, with “more observant daughters, more affectionate sisters, more faithful wives, more reasonable mothers” (Wollstonecraft, 1792, p. 105). Yet by the nineteenth-century women were regarded as possessing more morality, and less intellectuality than men according to philosopher J. S. Mill in the 1869 publication *The Subjection of Women*. Mills also stated that because of the history women have been subjected to, that:

Women are taught to live for others; to always give and never take; to submit, yield and obey; to be long-suffering. They are also taught to demur to men because they are not as smart and strong as men. This being the case, women's virtue is not the product of autonomous choice. Rather, it is the consequence of social programming (1869, p. 142). Since the nineteenth century, when American women first gained access to higher education, the choices and opportunities afforded women have expanded greatly (Davis, 1991).
In 1873, Harvard professor Dr. Edward Clarke affirmed his thought that women should not be allowed to attend college. If young women studied too much, he asserted, they would divert blood away from the uterus to the brain, rendering themselves “irritable and infertile” (Clarke, 1873). Then, in 1903, Paul Julius Möbius, a German neurologist, measured the volume of the skulls by pouring sand into skulls of men and women of varying age and body weight. Möbius found that the cranial capacity of the skull in a man averaged about 8% more than in the skull of a woman the same age and height. He concluded that women are “physiologically weak-minded” (Pedraza, Gamez, & Rovira, 2000, p. 1059). Later, a 2005 UCLA study reinforced the difference between males and females. Data concluded that the cerebral cortex (where most of our complex thinking takes place) in women is significantly thicker than in men. When you adjust for size differences between women and men, the differences became even more dramatic, with the cortex being thicker in many areas in women’s brains compared with men. There was no region of the brain found where the cortex is thicker in men than in women. Not only are gender differences confirmed, societal variation is evident as well.

In early colonial times, women were the main food-gatherers and producers. Female responsibilities included societal constraints such as working in the house, rearing children and crocheting were commonplace for the female gender. However, women were able to explore new fields after World War II. Still today, there are only a few fields which can truly be labeled as “male-dominated,” as women have not achieved the desired full equality in education. Elizabeth Blackwell may have conquered many misconceptions regarding the possibilities of women in a constrained period by becoming the first woman in the United States to receive a medical degree in 1849, yet, women
were still not considered equal of their male peers.

Until women are afforded the same opportunities men have, women will not be able to achieve their full potential in the workforce. As of 2009, the Bill of Women's Rights in the United States has yet to be fully implemented. Statistics show that as of 2009, the average U.S. female worker still earns about 20% less than the average male worker (Maher, 2008); only 17 of 100 U.S. Senators are women (Confessore & Hakim, 2009); and as of December, 2008, only 13 Fortune 500 CEOs are women (CNNMoney.com, 2009).

Analyzing the differences in male and females began long before this study, and will most likely continue long, thereafter. This particular study of Multiple Intelligences incorporation on middle school students, however, analyzed grade point averages of males in seventh grade history and compared them to the female GPAs in seventh grade history. In addition, the GPAs of males in eighth grade history were compared to females’ grades in eighth grade history at the end of one school year to see if an academic increase was shown. There was no difference between the genders found in seventh grade, but there was a significant variance in students in the eighth grade.

Accommodating Differences

According to Hunt (1997), the National Educational Goals Panel (NEGP) believes that in order to be more effective, research must be conducted and used as a teaching tool to better the educational realm. A consistent trend emerges across academic subjects. To date, there have been no dramatic changes in the performance of boys in recent years, no evidence to indicate a “boy” crisis, as some may identify it as. Elementary-school-age boys are improving their performance; middle school boys are either improving their
performance or showing little change, depending on the subject; and high school boys’ achievement is declining in most subjects (although it may be improving in math).

Statewide Systemic Initiatives (SSI) conducted evaluations gathering data regarding Science and Mathematics education improvements. The states included in the study were Arkansas, California, Connecticut, Delaware, Kentucky, Louisiana, Maine, Michigan, Montana, New York, Vermont, and Virginia. These states have developed and implemented curriculum frameworks based upon the 1992 Dwight D. Eisenhower’s Mathematics and Science Education State Curriculum Frameworks Projects (Tanner & Tanner, 1990). The choice to explore these states was due to the general inclusion of the United States as a whole, and not the individual states. Hunt (1997) chose to investigate the various approaches to curriculum, instructional materials, educational concepts, and other components of these states’ educational systems. Hunt also stated that whether decisions are made at the state or local level to improve students’ achievement, areas of need must be identified and the primary decision makers should be well informed. Few states were found to be motivated enough and in turn, believed it necessary to create their own new methods of instruction. These were Michigan, Montana, and New York. All three stated that specific implemented strands of Gardner’s Multiple Intelligences were found to be successful in producing higher scores and happier students (Hunt, 1997). Hunt found that of the states examined, only six states in the area of mathematics and four states in the area of science met the criteria to evaluate the progress of the SSIs, which proved once again that more work needs to be done to improve state assessment systems.
Curricular Structure

The building and development of a sound public education involves shared responsibilities. Mississippi State Superintendent of Education Hank Bounds indicated state government, local communities, parents, students, and school employees must work together to create an efficient public school system. Parents and students must assist schools with efforts to assure student attendance, preparation for school, and involvement in learning and requires a concerted effort of all parties involved to reach the desired outcome (Hunt, 1997). According to Wiles and Bondi (1993), curriculum developers are responsible for the creation of a public education system which assists all students with the necessary tools to ensure student achievement. A combination of meeting the philosophical needs as well as the state and national standards is necessary to be successful. Gardner recognized this need as well and investigated and developed the theory of Multiple Intelligences in 1983.

Several facets should be considered prior to curriculum alignment. According to Coburn (1996), among those considerations are national standards, local needs, state guidelines, test specifications, and the individuals who will be directly involved in the alignment. Curriculum needs should strive to meet developmental needs (Coburn, 1996). Erickson (1995) states that two critical points to be considered when aligning curriculum should be vertical articulation, to assure what is taught prior to and afterwards, and horizontal articulation, to assure that the same core curriculum is taught throughout the state. The five critical questions to ask when developing curriculum are: What will be taught? When will it be taught? How will it be taught? What resources are necessary to accomplish the task? and how will the results be evaluated? (Wiles & Bondi, 1993). Educational strategist Erickson, in conjunction with Wiles and Bondi, agreed on the
following items to consider when designing curriculum. First, a decision on how to organize teaching must be made. Classrooms may be self-contained, fully departmentalized, instructional teams, or interdisciplinary teams. Second, the training of the teaching staff must be taken into account. Educational licenses range from grades 1-9, K-8, K-4, 4-8, 7-12, and K-12. Next, the determination should be made as to what curriculum offerings will be available. They may include vocational, enrichment, or technical preparatory courses. Another item for review is time scheduling. Schools may be on a block, traditional, modern block, or self-contained schedule. Lastly, schools must consider the demands of the students. This would include such things as electives, clubs, or sports (Wiles & Bondi, 1993).

When re-visiting curriculum and preparing to implement changes, teachers, parents, administrators, and the community should also have input (Coburn, 1996). A powerful word in education is ownership. Gardner’s Multiple Intelligences allow the students to utilize their strengths through learning, which will make them more receptive to learning new material and the re-visiting of previously learned materials. If students are made aware of their learning styles, these areas of personal and academic growth may appear to be of greater importance to the students, thus stressing ownership.

Reform through the Years

According to the 1996 United States Department of Education, the number of students in traditional classrooms failing to thrive in today’s schools is continually increasing each year. This was attributed to a lack of appropriate response to student diversity, and, therefore, the process of searching for a more inclusive look at education became expedient (Erickson, 1995). A more desirable and productive approach was to enhance the traditional classrooms. Gardner’s Multiple Intelligences offer numerous
ways to cultivate and enhance creativity in all students in an educational setting. An example of these teaching methodologies when teaching the 5 themes of Geography in a traditional 8th grade classroom is offered in Appendix A. The Appendix offers numerous teaching strategies which utilize the Multiple Intelligences.

Ever since the beginning of public education, reform has been evident. Between 1630 and 1640, over 20,000 Puritan men, women, and children, searching for religious freedom, participated in the “Great Migration” to establish a new home with the right to worship as they pleased. Thus, it is believed that the English had the greatest influence on American education (Progressive labor movement of past, 1964).

Massachusetts offered no formal schooling, yet when the colonists decided reading was a necessity, laws such as the Massachusetts Acts of 1642 and 1647 were put into effect to ensure that each community taught this basic skill. The Law of 1647 made formal schooling more of a social responsibility, and teachers were formally hired for the sole purpose of educating colonial children. It was a common perception that if all citizens could understand the written language, they would then be able to understand and abide by the laws of the land (Mass Ed. Laws of 1642 & 1647, 2007). The history of American public education traces its roots to early Colonial history with middle colonist William Penn’s 1683 reform movement. Benjamin Franklin’s Philadelphia Academy was created in 1751, and in 1779 Thomas Jefferson opened educational possibilities specifically to white males. Horace Mann, however, was the person attributed with the beginning of the common school movement during the early 1800s. Mann introduced diversity into the curriculum to meet the demands of a rapidly changing society and economy and to address the ever-apparent educational gap (Ornstein & Levine, 1993). Both Benjamin Franklin and William Penn of Philadelphia stressed the idea of “practical”
education in Pennsylvania and although colonial leaders agreed that this type of education was important, they were, however, not concerned with providing it, according to the Educational World Millennium Series. This is not unlike legislators today, as Gardner believes educating the “whole-child” is most important, and although most legislators may agree to the importance of this, they are not concerned enough to make the necessary changes, and instead focus more upon test scores.

Educators no longer teach to reach each individual child, but instead the mass are included in public education, a practice that ultimately began as a result of the Industrial Revolution (Glubok, 1969). As Chubb and Moe (1990) stated,

> Until the first few decades of the 1900s, there was really nothing that could be meaningfully called a “public” system of education in the United States. Education was about simple, important things that ordinary people cared about and could understand. Above all else, it centered on teaching, on how their children were taught and who taught them. (p. 48)

Oftentimes one does not comprehend that history builds upon history. Events in history did not just happen independent of prior events, but because of prior events. The Cold War is known as the space exploration competition between the United States and the Soviet Union. History, moreover education, changed dramatically on October 4, 1957, when the Soviet Union successfully launched the world's first artificial satellite, Sputnik I (Garber & Launius, 2002). The Soviets launched Sputnik II on November 3, 1957. The launching of Sputnik in 1957 in essence sparked the “new era” of social studies reform. The Soviets had beaten the United States into space, and, therefore, pundits blamed schools and their curricula. During his presidency from 1961-1963, John F. Kennedy was responsible for numerous strategies that would allow Americans to be more
competitive. Reformation began with foreign languages, science, and mathematics and then spread into the field of social studies. Wade (2002) voiced many of Gardner’s beliefs as he asserted:

over the past 100 years education has changed drastically, and now with new knowledge about students’ interests, how students learn, and how they correlate these guided experiences to their outside world, education frameworks must be revisited to accommodate learners of the 21st century. (p. 115)

The National Council for the Social Studies (NCSS), a private organization of social studies teachers and professors, decided to begin the construction of educational standards. President Lyndon B. Johnson revised Kennedy’s strategies and initiated the 1965 Elementary and Secondary Education Act (ESEA) which implemented accountability into education to increase achievement of poverty stricken and special needs students. The ESEA allocated federal dollars to provide for this accountability movement. Schools that received this funding had to provide evidence of effective implementation of academic achievement programs (Dorn, 2003).

The New York State Archives alluded that during the 1970s, the “new” social studies era had run its course. The aforementioned influences in education resulted in key changes in methodologies and instruction. These changes directly affected how educators taught and essentially began the multitude of trends in the area of curriculum and assessment. The many alterations and numerous trends in the content area of social studies curriculum reformation which have occurred in the past are shown within this proposed study. The rationale for the in-depth explanation of how curriculum and assessment has evolved over past decades is to show how the impact of historical events
has changed teaching strategies throughout the course of time, and how one trend essentially led to another; with none producing the desired results.

The 1982 Education Reform Act (ERA) signed into law by President Ronald W. Reagan was very influential in the implementation of the current public school accreditation model and accountability system. Many experts believe that efforts to better America’s educational system have resulted in chaos due to states having different curriculum and standards (Walden & Kritsonis, 2008). There were many problems regarding inconsistency of the curriculum standards set for students to achieve; therefore, in 1989 President George H. W. Bush and each state’s governor met to create nationally implemented common curriculum standards.

Standard-based reform became the newest movement at the time. This type of reform involved more rigorous curricula. The primary goal of this tri-fold reform was to challenge student reasoning and knowledge application, increase student achievement, and increase graduation rates. In 1991, this movement, America 2000, was adopted in hopes of reducing the dropout rate (Knight & Erlandson, 2003).

America’s next educational reform came in 1994 with the reauthorization of ESEA. President William Clinton developed strategies to raise standards with the premise of guaranteeing that students would be more stringently monitored for results of successful student achievement. These strategies were called the Improving America’s Schools Act (IASA) and Goals 2000: Educate America Act (Department of Education, 1999). Clinton’s IASA and Goals 2000 served as a foundation for the Educational Excellence for All Children Act (EEACA) of 1999. The EEACA focused on programs and procedures to ensure improvement in many areas of education. The acts required highly qualified
educators and administrators, a favorable learning environment, and accountability and assessments that would promote student achievement, essentially leading to success.

Senate Bill 2156 forced the Mississippi Department of Education (MDE) to create the Mississippi Student Achievement Act of 1999. The goal was to create and implement evaluations to improve the educational system by establishing growth models and performance classification levels to identify schools that had previously not met student achievement standards (MDE, 2008b). In January 1999, Mississippi State Superintendent of Education Dr. Richard Thompson and five State Board of Education members created the Algebra I, Biology I, English II, and U.S. History assessments of the Subject Area Testing Program (SATP) which were designed to measure student achievement. Identification of schools not meeting the appropriate level of student achievement was remedied by Senate Bill 2488. This act brought a new measure of accountability to individual schools.

President George W. Bush signed the No Child Left Behind Act (NCLB) of 2001 into law on January 8, 2002. NCLB is the re-authorization of the 1965 ESEA, yet it brought about more standards and further required the SATP assessments to be administered in all schools in the country, with each state carefully monitoring student achievement (MDE, 2008b). NCLB does not emphasize a national achievement standard, as standards are set by individual states in conjunction with local control of schools and in compliance with the Tenth Amendment to the United States Constitution. This amendment specifies that powers not granted to the federal government are the reserved powers of individual states.

NCLB holds public schools accountable for student performance in many ways which extend the reach of previous federal legislation into local education systems. Because of
NCLB, educators have found the demand greater to increase graduation and accountability rates (Afflerbach, 2004). In President George W. Bush’s speech addressing students and teachers, he accentuated his belief in NCLB and reaffirmed that the United States would continue the strive to ascertain the position of educational leaders in the nation today:

NCLB is an important way to make sure America remains competitive in the 21st century. We’re living in a global world. See, the education system must compete with education systems in China and India. If we fail to give our students the skills necessary to compete in the world in the 21st century, the jobs will go elsewhere. That’s just a fact of life. It’s the reality of the world we live in. And therefore, now is the time for the United States of America to give our children the skills so that the jobs will stay here. (U.S. Department of Education, 2006, p. 2)

NCLB provides funding to schools; therefore, expectations are that increases will be made in AYP achievement. Because of these mandated laws, states are required to develop assessments to be administered to 95% of all students in grades 3-8 and grades 10-12. These assessments must provide some measurable means by which schools can demonstrate that all students are achieving AYP. NCLB’s AYP goal for students is to achieve 100% proficiency on state assessments by the school year 2013-2014. Hursh (2005) stated that schools that do not achieve AYP will face scrutiny and possibly harsh penalties. Additionally, dropout rates spurred Mississippi’s 2008 “On the Bus” campaign to decrease dropout numbers (MDE, 2008b). The most current reform act handed down was the Children First Act of 2009. Section 3 of Senate Bill 2628, in the code at Section 37-17-6(9) (a), directs the state Board of Education to come up with a definition of what should be in a district’s annual report card and requires that all districts publish their
report cards in their local newspapers as well as on their Web sites in a printable format (Barbour, 2008, ¶ 7). This act has already endured some criticism from the public. Executive newspaper editor Charlie Mitchell (2009) wrote that

It’s yet another reform passed in the ongoing quest for “accountability.” For school districts that are task-oriented and mission-driven, it will be yet another distraction; for districts that keep failing students year after year, it will be yet another requirement to skirt. (¶ 3)

Mitchell states that often lawmakers feel compelled to enact something, even if what they outline has little practical effect, yet this act is more focused and directed than some in the past. The act itself provides a more explanatory definition of what it means to be a failed district, thus prompting state intervention and control, as when schools fail districts must develop and disclose a written plan of action to provide the desired results.

Assessment

Assessments indicate how well students perform individually and as a group and where strengths and weaknesses lie (Covington, 1984). Gardner’s Multiple Intelligences assess students’ strengths and weakness. Many people in education would concur that anything worth doing is worth measuring. According to Hunt (1997), “one basic premise in designing a system to assess students’ learning is that there should be a good match between what is being tested and the important goals established for what students should know and be able to do” (p. 7). Most educators assess performance based on test scores. Curriculum results are often revised based upon test results and result in inappropriate actions being taken and unnecessary changes being made. It may be more productive to compare these test results with national scores in order to assess equality.
Provenzo (2008) stated, “authentic assessment enables educators to determine students’ skills, knowledge, and competencies and to provide evidence of their learning” (p. 84). Gardner (1983) seemed to agree as he also uses an integrated approach by combining real-world tasks, performance-based measures, and complex rubrics to encourage a greater understanding of concepts. Schubert (1986) defined authentic assessment as a more engaging and effective way to measure students’ learning while promoting understanding and valuing the process of learning. He also implied that this was in response to rote memorization and less complex assessments. Schubert, in conjunction with numerous other educational theorists such as Gardner, Sternberg, and Armstrong, shared in these same beliefs that assessments should be based upon the individuals, and not stereotypical as a one-size-fits-all approach, and students need to be assessed individually (Schubert, Schubert, Thomas, & Carroll, 2002). Bandura (1997) developed a social learning theory called self-efficacy and utilized this belief in one’s ability as the foundation for student achievement. He believed that if success was not attainable, failure would perpetuate a lack of confidence and inevitably dictate future decisions of the students. Educational settings present numerous opportunities for success and failure, thus possibly having a direct impact on students’ developmental growth (Bronfenbrenner, 1979). The Theory of Human Motivation states that all people have an innate desire for personal success and achievement (Maslow, 1943). Multiple Intelligences allow educators to question their work and to encourage them to look beyond the narrow confines of the dominant discourses of skill testing, curriculum, and testing (Smith, 2008). Smith provides the example of Mindy Kornhaber (2001) and her colleagues at the Project SUMIT (Schools Using Multiple Intelligences Theory) and describes how the study examined the performance of a number of schools and concluded
there have been significant gains in SAT scores, parental participation, and discipline. Schools themselves attributed these milestones to the MI theory (Project SUMIT, 2000).

Brualdi (1996) recognizes to what extent Gardner utilizes the Multiple Intelligences to accentuate students’ strengths and continually work to develop skills as well as improve their weaknesses. Armstrong affirms that Gardner’s MI theory has become a major cornerstone of education; and by embracing a wide array of human talents that significantly contribute to an individual’s intellectual and cultural life, MI theory offers a broader definition of intelligence than is measured by standard IQ tests (Chen, Moran, & Gardner, 2009). The MI theory supports and celebrates the diversity of children's strengths in school and other learning environments.

Assessment Development

It was not until the 1990s that the United States government and state legislators began to raise questions regarding the educational process and suggested holding public education accountable. This led to a probe into the testing measures used by educators nationwide. This renewed interest insightfully brought about testing at various stages in students’ educational process. The Minimum Competency Test (MCT), which came about during the 1970s, measured the basic skills of students in grades 8-11. This test became a more standardized attempt to regulate the curricula and improve the depth of student learning. Mandatory standardized testing evolved to provide benchmarks of student competency within school districts, as well as nationwide. It was soon discovered that this method of assessing performance on the superficial level was not successful (Isaacson, 2009). Tests can very often direct everything that teachers teach. Social studies curricula demand attention to students’ individualism, and nationalism, yet free expression must be contained. In Virginia, for example, test writers from Harcourt Brace
were told that no test question would be allowed that mentioned Nat Turner's slave rebellion. In California, testing standards mention Japanese-Americans who joined the U.S. Army during World War II but not those who fought against internment. Because the tests are now of utmost importance to the school systems, curricula that teachers are required to teach are becoming more and more restrictive, with detailed pacing calendars or even pre-written lessons that keep each teacher in the same place on the same day. Even without specific dictates, most teachers feel constrained by the need to have students pass the tests (Wiggins, 1993).

Educator Grant Wiggins (1993) believes that standardized assessments hinder authentic assessment. He states “authenticity produces greater student achievements and learning while providing relevant, contextual, real-world applications of curricular concepts that incorporate problem-solving and critical thinking skills” (p. 84). Wiggins indicates that educators need assistance determining what to assess and clearly define objectives. Jay McTighe and Wiggins later created a design to seek teacher input of the desired outcome, and then clearly defined the process to be followed to achieve these results. Gardner's Multiple Intelligences theory provides educators with necessary tools to reflect on their teaching practice and gives them a basis to broaden their focus to attend to what might assist people to live their lives well (Smith, 2008).

Oftentimes, the reason for testing failure is poor instruction, poor test construction, or students’ lack of preparation. Erickson (1995) stated that two ways to improve test results are to improve curriculum and to improve instruction. As Gardner has re-affirmed, the greatest difference in educating children can be made in grades 1, 2, 3, and 4 (Gardner, 1999b). High school, however, is more a time of considering future options such as the job market, technical training, vocational training, or college. Hunt (1997) states that
changing assessment systems is quite rigorous and extremely difficult to do, and provided the example of California lacking public support for reform because standards were extremely costly.

To aid in organizing a workable curriculum framework, the state curriculum is divided into strands that have organizational structure and are written in broad general terms that possess measurable objectives. The resources used to teach the material were also identified and an appropriate timeline provided. To design and carry out reform that supports the much-needed changes in state education systems, creative and strategic thinking is necessary.

Assessment Possibilities

TIMSS 1999 claims there is a “characteristic pedagogical flow” which varies within educational systems (p. 14). The TIMSS publication *Pursuing Excellence* reveals the results of over 200 classrooms and states the findings to be very discouraging. Conclusions showed eighth grade American mathematics teachers seldom developed concepts and generally only concentrated on individual skills. World-wide studies showed 87% of Japanese lessons and 60% of German lessons were from medium to high quality, whereas only 13% of American lessons were judged to be of high quality. Hunt (1997) alluded that teachers play a crucial role in classroom success or failure, and educators should teach the material for understanding of concepts instead of memorizing facts or drilling repetitious skills. Multiple Intelligences strategies offer numerous ways to teach any concept or content focusing on comprehension and not memorization or drills. Hunt also states that textbooks do not have to be used as a primary source for teaching; instead, they can be supplementary guides to incorporating strategies, methods, and techniques into a classroom. Gelb (2007) acknowledges that education of the whole
child requires a whole-curriculum. Campbell (1997) states that MI impacts the whole person. “If the whole student is considered, other areas, including attitude and academics, also improve” (p. 32). Ravitch (2000) agrees with the concept and states that the 20th century saw a series of reform movements which were considered reactions to the numerous previous educational movements and notes that children needed well-educated teachers who were willing to use different strategies depending on what worked best for which children, much like that of students today. Because change is continual, education must also change to keep up with society. Ravitch (2000) concluded, “American schools undertook reform after reform, based on unproven and unworkable theories, resulting in attention being diverted from the schools' essential purpose: the intellectual development of every child” (p. 260). According to Berger (1991), the best way to provide the necessary skills to students is through integration of the students’ primary learning characteristics using a broad range of integrative content incorporating a centralized theme, as opposed to focusing on one specific content area. Appendix A is an example of how the researcher used the Multiple Intelligences to incorporate this suggested broad range of content in a variety of ways.

Budgetary Reasoning

Throughout the past centuries, trillions of dollars have been spent on educational reform. Pollard (1985) indicates that massive government funding was allotted for curricular changes brought on by the Cold War and Sputnik I and Sputnik II. When reform is implemented as it has been numerous times throughout the past, money must be provided for additional resources to make the reformation as successful as possible. Over the last 5 years, base student cost has risen from $3,889 in 2005 to $4,753 for the current 2009-2010 school year, providing evidence that funding is granted for public school
students in the state of Mississippi, yet test scores are not improving. Hull (2008) says the obvious financial difficulty with regard to education as he states, “In the face of budget shortfalls, states across the region are reviewing their spending plans for the current fiscal year to determine where cuts can be made” (¶ 1). Within state budgets, education is the largest component of state expenditures. In Mississippi, as well as in neighboring states, budgets are among common educational concerns. Alabama, for example, used $440 million of its “rainy day” fund in fiscal year 2008 to avoid prorating of the education budget, an action which wiped out the state’s reserve fund. Florida was forced to reduce educational appropriations two times during the 2008 fiscal year, cutting a total of approximately $500 million dollars. In Louisiana, because of mineral revenues on oil, there was a surprising increase of over $183 million. Georgia, however, was among the declining states as well as the state was forced to reduce revenues by more than $1.25 billion statewide. Tennessee does not share with the aforementioned states in having income taxes from which to rely for public education funding, as that state is dependent upon sales taxes for general revenues. Tennessee projects anywhere between a $300 million to a $600 million shortfall for the current fiscal year. Mississippi’s K-12 budget for the past school year increased one-tenth of a percent from $2.234 billion to $2.235 billion. The K-12 appropriations account for 45% of the total state expenditures in Mississippi. According to the National Association of State Budget Officers, 2006 State Expenditure Report, the total spent on public education for the Southern portion of the United States was $189,476,000,000 whereas, for the entire United States, the total was $651,591,000,000. In Governor Haley Barbour’s (2008) letter to the Mississippi senate proposing over $4 billion for education in the 2009-2010 school year to public schools in Mississippi, he stated, “My budget reflects the fact that public education is the number
one economic development issue in our state, and it is the number one quality of life
issue” (p. 3). Governor Barbour also said that because he believes so strongly in
Mississippi’s educational progress, it appropriately takes up 60% of the state budget. He
delineates that over $8,500 per child will be spent in the 2009-2010 school year.
Spending massive amounts of money for public education, however, does not assure that
students will be successful; nor does it promise an increase in test scores or a decrease in
drop-out rates. Gardner suggests that if educators can make the material relevant to
students, they will learn the skills and objectives and essentially become successful
learners.

Barbour (2008) advocated the State of Mississippi Superintendent of Education Hank
Bounds’ proposal to make education more relevant to high school students in hopes of
preventing student dropout. A school district’s attendance is one of the driving factors in
both the state and federal funding. If attendance is down, funding is also down; therefore,
the necessary changes must be made to increase attendance or even more money will be
cut from public school budgets. Making educational concepts and objectives more
relevant to students of all ages may be an even earlier deterrent to student dropout.
Because the goals of state administrators and educators are to improve educational
achievement, one must provide students the tools necessary to learn in the most
productive manner (Gelb, 2007). Gelb theorized if educators instill these traits in children
at a younger age, students will have more opportunities in the job world once high school
and/or college are completed. For this reason, the researcher chose to conduct this study
to examine the possibility that teaching students utilizing Multiple Intelligences
instruction generates higher student learning.
Mississippi’s curriculum and assessment, funding for education, and reform are often points of concern, and all have severe ramifications if not properly attended to. These concerns may stem from the awareness of the need for change. Many may also share Mitchell’s (2009) opinion of the rationale for most educational reform:

The quality of education is not set or driven in the halls of government in Washington. It’s driven in the neighborhoods and counties and cities where stakeholders either invest themselves or choose not to become involved. Nobody can keep the smallest town from having the best schools if that’s what the townspeople want. No law can create a good school where people don’t accept or understand that the higher the expectations and standards, the higher the net performance. (¶ 16)

Not only is attendance a factor in the amount of funding public schools receive, money allocation is also based upon meeting specific requirements. Mississippi State Superintendent of Education Hank Bounds received notification on August 6, 2007, from U.S. Department of Education Assistant Secretary for Elementary and Secondary Education Kerri Briggs (2007) that Bounds’s preceding participation in the U.S. Department of Education's standards and assessment peer review process under Title I of the Elementary and Secondary Education Act of 1965 (ESEA), as amended by the No Child Left Behind Act of 2001 (NCLB), had provided evidence which indicated that Mississippi's standards and assessment system does not meet all of the statutory and regulatory requirements of Section 1111(b)(1) and (3) of the ESEA. Briggs (2007) also stated that the education department could not approve Mississippi's current standards and assessment system, due to concern with achievement standards, technical quality, alignment with grade-level content standards, and inclusion for the Mississippi Curriculum Test
(MCT), the Mississippi Alternate Assessment of Extended Curriculum Frameworks (MAAECF), the Mississippi Subject Area Testing Program (MSATP), and the new high school assessment based on alternate academic achievement standards. (¶ 2)

Briggs’s letter did, however, acknowledge that Mississippi was in the process of revising the assessment process with intentions of fully implementing the new general assessments, the MCT2 and MSATP, for the 2007-2008 school years. Title I funding was conditional upon the assessment revision in adherence of the regulations. Local newspaper articles have made the general public cognizant of the reform when referring to the MCT2 tests which are meant to probe greater depths of knowledge (Scallan, 2007).

While budget concerns are overwhelming in the area of education, a solution of change is attainable for the state of Mississippi. Briggs (2007) acknowledged the tremendous gains to implement the new high school alternate assessment and the MCT2 field test, while mentioning that “the hardship imposed upon Mississippi by Hurricane Katrina in 2005-06 diverted Mississippi's time, energy, and resources at such a critical time” (¶ 4), and the Mississippi Department of Education made the decision that despite the catastrophic event, Mississippi had made much progress revising its standards and assessment system and concluded that there would be no withholding any portion of Mississippi's 2007 Title I administrative funds. Although monetary necessities would not be withheld at this time, however, changes once again were a requirement for future funding (Hull, 2008).

History Matters

The National Council of Social Studies delineates that “U.S. History is different from other disciplines because it requires integration of the intellect and emotions”
(Contemporary perspectives on social learning, 1984). This case study sets out to produce recommended changes, implementation, and assessment to improve student learning. Researchers such as Sternberg (1994), Armstrong (1995), and Campbell (1997), along with numerous others, concur that educational reform is a necessity and have based their studies upon Gardner’s Multiple Intelligences theory. The necessary change is not in question; what is in question, however, is the method of this change.

The present study began in 2007 and was conducted through the use of the learning strategy Multiple Intelligences. When students were given the opportunity to discover their personal strengths in the Multiple Intelligences and learned how to utilize and implement those strengths into a daily routine, their successes were evident in U.S. History academic achievement. A longitudinal study was conducted to examine if Multiple Intelligences were currently present in the minds of these students after two years, and if so, to what extent were Multiple Intelligences utilized. As Alter and Denworth (1990) noted, “History itself isn’t boring; it’s just taught that way” (p. 31).

Howard Gardner and Multiple Intelligences

The theory of Multiple Intelligences originated from Howard Gardner in 1983. In the United States, Gardner's work with Multiple Intelligences has had a profound impact on both researchers and practitioners in education. This study explored Gardner’s theory of Multiple Intelligences, why it found a ready audience amongst educationalists, and some of the issues around its conceptualization. Gardner (1999a) states:

I want my children to understand the world, but not just because the world is fascinating and the human mind is curious. I want them to understand it so that they will be positioned to make it a better place. Knowledge is not the same as morality, but we need to understand if we are to avoid past mistakes and move in productive
directions. An important part of that understanding is knowing who we are and what we can do. Ultimately, we must synthesize our understandings for ourselves. The performance of understanding that try matters are the ones we carry out as human beings in an imperfect world which we can affect for good or for ill. (pp. 180-181).

The modern study of intelligence can be traced back to Binet (1916), who began his study in the late 19th century and continued well into the 20th century. According to Binet, intelligence was generally believed to be a single inherited entity. He rationalized that humans could be trained to learn any material, provided it was presented in a suitable way. Gardner questioned Binet’s theory, as well as challenged the cognitive development of Piaget. Gardner also did not agree that intelligence could be measured from an IQ test and shared his numerous beliefs regarding the intelligences with many educational researchers. Among those beliefs are the existence of a multitude of intelligences in human beings which are independent of each other; that each intelligence has its own strengths and limitations; that the mind is far from imaginative at birth; and that it is unexpectedly difficult to teach things that go against early inherent theories which challenge the natural lines of force within an intelligence and its matching domains (Gardner, 1983).

In Gardner’s (1983) introductory work *Multiple Intelligences Frames of Mind*, he stated that the personal intelligences were only a portion of the whole puzzle to human understanding, and that the total of the seven intelligences function independently of one another. All intelligences complement one another and help to develop skills and solve problems. Gardner viewed intelligence as “the capacity to solve problems or to fashion products that are valued in one or more cultural setting” (Gardner & Hatch, 1989, p. 6).
Gardner first reviewed the literature using eight criteria or “signs” of an intelligence, examined data sets, and concluded that there are eight criteria which signify intelligence. The eight criteria for identifying Multiple Intelligences are as follows:

1. Potential isolation by brain damage
2. The existence of idiot savants, prodigies, and other exceptional individuals with jagged cognitive profiles
3. An identifiable core operation or set of operations
4. A distinctive developmental trajectory, culminating in expert performances
5. An evolutionary history and evolutionary plausibility
6. Support from experimental psychological tasks
7. Evidence from psychometric findings
8. Susceptibility to encoding in a symbol system. (Gardner, 1983, pp. 62-69)

Gardner states, “I consider the set of criteria to be the most original and the most important feature of MI theory” (1983, p. 61). He notes that anyone can develop a set of criteria to fit a theory, however, it is basically only a work of imagination and has no basis or scholarly credentials to back the information and results.

A main driving force for educational reform in the assessment movement has been Gardner's work. Gardner has been, in Smith's (2008) words, a “paradigm shifter” (¶ 4). Gardner searched for evidence that at a specified time a child may be at very different maturation and developmental stages. His rationale has always been that the education of the whole child, and not just facets of the child, should be the top priority.

Gardner’s initial theory of Multiple Intelligences comprised seven primary forms of ability which he believed were distinct and relatively independent intelligences. Since the origin of the multiple intelligences, Gardner has added three new intelligences and is
continually seeking others. Gardner said that each individual person possesses all intelligences in varying degrees. Gardner provided extensive research to support his theory that human intelligence is not singular, but rather multi-dimensional, and stated that on a scientific level, the Multiple Intelligences theory makes two claims. First, all human beings possess abilities to function; therefore, Gardner labeled them intelligences. Secondly, no two humans possess the same strengths and weaknesses. All persons are individually functioning. Another point of interest that Gardner explored was that intelligence was inherited. Strengths and weaknesses in one person do not predict strengths and weaknesses in another. Gardner also knew that within the field of education, some saw the theory as relating to curriculum, while others visualized the theory as about assessment, and still some viewed it as relating directly to pedagogy.

Gardner began his research as a psychologist researching brain injuries at Boston University. He also worked with children at Harvard’s Project Zero which was designed to study cognitive development and the association of educational implications. Through his research Gardner recognized the correlation between his strong interest in brain injuries and his fascination with the arts. He suggested that intelligence is not just a single attribute which could be measured by an assigned number (Sternberg, 1994). Although the concept of Multiple Intelligences has been primarily focused on younger children, it is applicable to all ages. Gardner (1999a) stated:

Both of the populations I was working with were clueing me into the same message: that the human mind is better thought of as a series of relatively separate faculties, with only loose and non-predictable relations to one another, than as a single, all-purpose machine that performs steadily at a certain horsepower, independent of content and context. (p. 32)
Given that there are revolutionary differences between intelligence quotients (IQ) and Multiple Intelligences (MI), Gardner (1983, 1999a), along with other researchers such as Sternberg (1985), Campbell (1997), and Armstrong (1995), realized that there is more than a single way to study intelligence.

Originally, there were only seven multiple intelligences defined by Gardner (1983). They are Musical, Bodily/Kinesthetic, Visual/Spatial, Interpersonal, Intrapersonal, Verbal/Linguistic, and Logical/Mathematical. According to Gardner, each of these seven intelligences possesses specific abilities which can be measured and observed. The seven intelligences defined are:

1. Musical intelligence involves skill in the performance, composition, and appreciation of musical patterns. It encompasses the capacity to recognize and compose musical pitches, tones, and rhythms.
2. Bodily-kinesthetic intelligence entails the potential of using one's whole body or parts of the body to solve problems. It is the ability to use mental abilities to coordinate bodily movements.
3. Spatial intelligence involves the potential to recognize and use the patterns of wide space and more confined areas.
4. Interpersonal intelligence is concerned with the capacity to understand the intentions, motivations and desires of other people. It allows people to work effectively with others.
5. Intrapersonal intelligence entails the capacity to understand oneself, to appreciate ones’ feelings, fears and motivations.
6. Linguistic intelligence involves sensitivity to spoken and written language, the ability to learn languages, and the capacity to use language to accomplish certain
goals. This intelligence includes the ability to effectively use language to express oneself rhetorically or poetically; and language as a means to remember information.

7. Logical-mathematical intelligence consists of the capacity to analyze problems logically, carry out mathematical operations, and investigate issues scientifically.

(Gardner, 1999a, pp. 41-43)

Although there were seven Multiple Intelligences identified by Gardner; however, today, one must include the 1988 and 1996 incorporation of additional intelligences: the Naturalist and the Existentialist. The definition for the each of the two according to Gardner (1999a): Naturalist involves the potential for discriminating among plants, animals, rocks, and the world around us, as used in understanding nature. Existentialist is described as "Capturing and pondering the fundamental questions of existence” (p. 48). While Gardner has proposed the spiritual intelligence, confirming it to meet the criteria to be labeled as an intelligence has proven to be quite complex. This is especially rigorous due to the unsubstantiated claims of truthfulness in regard to one’s spirituality, as well as implications of the effect on others. He states, “I find the phenomenon perplexing enough and the distance from the other intelligences vast enough to dictate prudence at least for now” (1999a, p. 66).

Gelb (2007) focused his study on the long-term results of the implementation of Multiple Intelligences of students as he stated that integrating logic and analysis with imagination and intuition will result in more productivity as an adult. He predicted that teaching students to think uniquely in the classroom would provide them the tools necessary for real-world application. His theory supported Draper’s (2006) connections with the real-world and stated how students need more correlation of these areas to be successful in the future.
Multiple Intelligences researchers such as David Thornburg, of the Educational Resources Center, have reported witnessing numerous other benefits of MI, such as increased parental and community involvement and increased self-esteem, and observed that students became more actively involved. He noted that “when teaching students for understanding, they will be more capable of creating possible solutions to problems in life with the inclusion of Multiple Intelligences” (Educational Resources Center at Thirteen/WNET New York, n.d.). Active parent and community involvement research shows that students of more involved parents tend to be more productive learners (Koksal & Yel, 2007).

Hickey (2004) conducted a study of five middle school teachers’ implementation of Multiple Intelligences concepts integrated within the traditional classroom. These educators found that students welcomed the variety of instruction and noted the importance of students realizing their own personal strengths. These educators reported an academic increase which supported their continued MI use in the classroom. Hickey stated:

Specific examples of individual teachers’ application of the MI theory within the context of an individual unit were rare. Because most middle and high school level students are expected to focus intently on academics as they plan for completion of high school, many educators believe that this form of “alternative learning” of implementation of Multiple Intelligences should be integrated within the early grades.

(p. 78)

This specific statement was the driving force behind this researcher’s utilization of the study of inclusion of Multiple Intelligences in an eighth grade U.S. History classroom. With education in need of great reform, the major goal of this study was to produce
knowledge that would benefit the participating students, their families, future organizations, programs, and communities, as well as the educational realm.

Since the publication of Gardner’s first book, *Frames of Mind* (1983), the Multiple Intelligences theory has become evident in the classroom (Armstrong, 1995). This theory has changed the structure of the traditional classroom for both the facilitator and learner (Bimonte, 1998). Because of Gardner’s theory of Multiple Intelligences, classrooms around the world are intently focusing on students’ individuality and, more specifically, their strengths and weaknesses.

Gardner’s foundation lies in the theory that there is a minimum of eight existing intelligences which each person possesses in varying degrees. Gardner provided extensive research to support his theory that human intelligence is not singular, but rather multi-dimensional, and that intelligence could not be measured by an assigned number (Sternberg, 1994). Although the concept of Multiple Intelligences has been primarily focused on younger children, it is applicable to all ages.

With every educator in the United States today facing the rigors of accountability and standardized testing, it is the responsibility of each professional to generate more proficient students each year. By affording educators the ability to identify student strengths and weaknesses in early and middle school grades, Mississippi students may be more likely to graduate high school and achieve the desired 70% rate of successful learners, which it fails to do year after year (Orfield & Walker-Huntley, 2005). Using the findings from the National Center for Education Statistics (NCES), Kaufman, Alt, and Chapman (2004) reported that between 347,000-544,000 students in grades 10-12 did not graduate high school from 1990-2001. The 2001-2002 school year produced 505,000 dropouts across the United States. There are various reasons for high school students
dropping out of school. Reasons included for this are lack of interest, excessive absences, lack of parental involvement, poor grades, and having educationally unmotivated friends. ABC News stated several school districts across the country experienced a 50% high school student’s drop out rate. ABC re-affirmed that other negative impacts included a shorter life-span of these drop-out students as well as a yearly salary decrease of $9,000 (Pierre & Date, 2006). Mississippi’s 2008 On the Bus campaign was designed to prevent an increase in high school dropout rates (MDE, 2008a). There is the possibility that if students are motivated at a younger age, such as elementary to early middle school, they will not be subject to drop-out status. Multiple Intelligences offer a creative and motivational way to learn and retain information while accentuating strengths.

Multiple Intelligences Theory and the Appeal Factor for Educators

Sternberg’s (1996) detailed explanation of the intellectual battle over traditional tests and conventional measures used to assess Multiple Intelligences provides a preface to the theory in history practice. Sternberg (1994) and Gardner (1999b) both showed a love of the knowledge of the intelligences and thrived at the thought of how the mind works within the historical realm. Many educators in general appear to have a positive reaction toward Gardner’s Multiple Intelligences theory. The theory is not solely confined to one grade, but can also be found within pre-school children and vocational and adult education initiatives. Gardner also makes the point that psychology does not directly dictate education but may assist in the educational process. Since eight kinds of intelligence exist, that would allow eight ways to teach, rather than the traditional classroom which generally only utilizes one way. Sternberg (1996) stated that powerful constraints that exist in the mind can be mobilized to introduce a particular concept or whole system of thinking in a way that children are most likely to learn it and least likely
to distort it, and often constraints can be suggestive and ultimately freeing. Campbell (1997) describes Multiple Intelligences as a means to foster high quality work and states that by using MI as a tool to promote high quality student work rather than using the theory, the intelligences may produce a more effective learner.

Kornhaber (2001) has identified numerous reasons why educators and policymakers in North America have responded positively to the Multiple Intelligences. The theory of Multiple Intelligences validates that students think and learn in various ways. This implementation will provide educators with a guide for organizing curriculum and reflecting on methods of assessment. Reflection may have led educators to derive new approaches to meet the needs of the range of all learners. Kolb’s experiential model also provides new ways for educators to reflect and revise current practices to be more successful in the classroom. Although Gardner did not specifically spell out in detail what the MI theory held for educators, he explored what this may do for the world of education in both his books *The Unschooled Mind, Intelligence Reframed* and *The Disciplined Mind*. To assist educators, Gardner suggests utilizing the approach inclusive of a broad vision of education, which describes how educators must meet the needs of each of the intelligences within the diverse classroom. Kornhaber (2001) describes it as “educators opting for depth over breadth” (p. 276). The second approach justifies developing local and flexible programs. The rationale for this is that creativity should be accentuated and not compacted due to the rigors of curriculum. Often one finds that assessment does not measure the performance, and instead just provides numerical data. The third approach may seem as if it is commonplace; however, educators must ascertain the best method possible to combine the fields of intelligence and morality.
MI Schools Across the United States

In the mid-1980s, the Key Learning Community in Indianapolis, Indiana, opened and began the journey as the first MI school in the world. Since opening, over 20 years later the Key School and the New City School of Multiple Intelligences in St. Louis, Missouri, has been the model for thousands and has hosted masses of people. Many came to gain first-hand insight as to how MI schools work and produce interactive learning. There are currently 17 schools around the world which are implementing Howard Gardner’s Multiple Intelligences theory. The schools include places such as Alabama, California, Canada, Connecticut, Florida, Indiana, Iowa, Michigan, Missouri, New York, North Carolina, Oregon, Utah, Virginia, and Washington. After visitors from Norway attended the opening of the MI Library at the New City School in Missouri, they were so pleased with their findings that they brought the ideas home with them and opened their own MI Library to foster and enhance creativity in their children. The Key Learning Community was featured on ABC News and in *Newsweek*, where many educators were exposed to the MI ways of thinking. Pat Bolaños, the founder of Key Learning, stood steadfast in the many faces of opposition and is currently reaping the many benefits of the MI school (Brualdi, 1996).

As Multiple Intelligences became accepted in Australia, in the beginning it was implemented incorrectly, and theorist developer Gardner spoke out publicly against it. It is no longer in effect. In the article “Reflections on Multiple Intelligences: Myths and Realities” (1995) Gardner cautioned educators of common misconceptions:

1. An intelligence is not the same as a sensory system. There are no “visual” or “auditory” intelligences.
2. An intelligence is not a learning style. Styles are ways in which individuals
approach a wide range of tasks.

3. An intelligence is a computational capacity whose strength varies across individuals.

4. An intelligence is not the same as a domain or discipline. A domain or discipline is a social construct. It refers to any profession, academic discipline, hobby, game, or activity that is valued in a society and features levels of expertise. Skill in a domain can be realized using different combinations of intelligences. And strength in a particular intelligence does not dictate in which domains it will be brought to bear.

5. People are not born with a given amount of intelligence, which serves as some kind of limit. We each have potentials across the intellectual spectrum; the extent to which these potentials are realized depends on motivation, skill of teaching, resources available, and so forth.

6. An individual should not be described, except in informal shorthand, as a “spatial” person, a “musical ” person, or “ lacking interpersonal intelligence,” for example. All of us possess the full spectrum of intelligences, and intellectual strengths change over time through experience, practice, or in other ways.

7. There are no official MI or Gardner schools. Many principles, goals, and methods are consistent with the principal assertions of MI theory.

MI Criticisms

There are some concerns and questions regarding Howard Gardner’s Multiple Intelligences; however, the most persistent topic is whether the criteria upon which Gardner bases his assumptions are adequate. Does his conceptualization of intelligence
hold together? And is there sufficient empirical evidence to support Howard Gardner's conceptualization? Probing the depths in response to these questions, White (1998) questions the inclusion of the application of the criteria and specifics surrounding the intelligences such as symbol systems, which criteria must be met, and why they are relevant. Gardner states that with the intelligences there is the element of subjectivity. The second question derives from those who measure intelligence by numerical data. Although Sternberg is a supporter of Gardner’s Multiple Intelligences theory, the idea of processing the material is one of which he is in contrast with Gardner. Another conflicting theory many people have is they often include musical and bodily-kinesthetic intelligence as a talent instead of including them as intelligences. In response to the empirical evidence supporting conceptualization, the most common criticism made is that much of Gardner’s work is not solely based upon grounded research, but, instead, on his personal rationale and perception. Often many take issue with the fact that there are no tests to identify or measure the various intelligences. Gardner’s theory supports the notion that tests generally lead to stigmatisms and labeling. In the early 1990s, Gardner began to look to the notion of distributed cognition as providing a better way of approaching the area than focusing on what goes on in the mind of a single individual (Gardner & Hatch, 1989). Often schools and institutions find themselves so busy, so self-confident, so beleaguered, or lacking in resources that they show no interest in any new ideas or practices.

MI around the World

Although there are some criticisms regarding Multiple Intelligences, numerous countries around the world have chosen to embrace the theory and put it into practice. Multiple Intelligences offer a cross-cultural approach in the field of education, and many
educational practitioners in countries such as China, Japan, the Philippines, South Korea, Norway, Argentina, Australia, Denmark, England, Ireland, Scotland, Romania, Turkey, and Colombia join in this educational endeavor. These countries embrace the multitude of facets that contribute to intellectual and cultural life. Armstrong (1995) states his view on Multiple Intelligences incorporation around the globe; the MI theory offers a broader definition of intelligence than is measured by standard IQ tests. Chen, Moran, and Gardner (2009) agree that the MI theory supports and celebrates the diversity of children’s strengths in school and other learning environments. More than a quarter of a century after the origin of Multiple Intelligences, this theory is now widespread throughout the world and is applied in the international arena. With the ever-growing diverse population that public schools are dealing with in today’s society, Multiple Intelligences serves as a valuable asset for both teachers and administrators (Chen et al., 2009). Chen et al. (2009) focuses on how the experiences of exam-driven countries like China and Japan will prove instructive to professionals faced with the task of improving both teaching and test scores. Gardner states, “What we typically term intelligence is really a combination of certain linguistic and logical-mathematical skills, particularly those that are valued in a modern secular school” (Chen et al., 2009, p. 265).

In Chen et al.’s 2009 work *Multiple Intelligences Around the World*, Gardner announces that he does not own the theory of Multiple Intelligences; he just developed it. He uses Richard Dawkin’s terminology—meme—when describing MI. Meme is a unit of meaning, and the meme of MI has spread like wildfire throughout the United States over the past 25 years and is currently taking hold in other countries (Chen et al., 2009). Time has caused the MI meme to spread beyond the United States. The theory of Multiple Intelligences was initially a proposal of how individual minds should be thought of.
China has many works published on Multiple Intelligences, including journals, books, and dissertations. Canadian scholar and archivist Clifford Morris stated he had found over 200 theses on Multiple Intelligences by 1999. John White from the United Kingdom aggressively voiced his dissent with MI. Instead of disregarding White’s theory, Gardner recognized it by saying:

We might credit White and a few other authors with putting forth a meme to counter the MI meme, whether that meme be a reversion to a single intelligence or a proposal for another way of thinking about a plurality of intelligences. (Chen et al., 2009, p. 117)

Zhilong Shen was a big force in popularizing Multiple Intelligences in China. In 2004, Gardner questioned the reasoning for MI being so highly regarded there, and a Shanghai journalist was able to clarify the answer:

Dr. Gardner, in the West, when people hear about the idea of Multiple Intelligences, they go directly to what is special about their child, to discover his or her ‘unique genius.’ In China, by contrast, the Multiple Intelligences are simply eight talents that we must nurture in every child. (as cited in Chen et al., 2009, p. 87).

Mary Joy Canon-Abaquin was in attendance at a convention on multiple intelligences and spoke to many educators about the influential MI school she had recently founded. Abaquin also traveled to the Philippines to share this information in hopes of informing educators. Oftentimes, Multiple Intelligences ideas were introduced along with other ideas and practices. In Ireland, Áine Hyland and her colleagues combined the perspectives of MI and a Project Zero initiative at both the secondary and tertiary educational levels (Chen et al., 2009). In Scotland, Gardner linked Brian Boyd and
Katrina Bowes as having been the bridge between the arts and creativity using the Multiple Intelligences framework. Myung-Hee Kim of South Korea has asserted the idea of Multiple Intelligences through contact with educators worldwide, the development of curricula and assessments, and the conduct of empirical research. Tim Brighouse featured MI ideas in the educational authority of Birmingham, England, with little success. In Japan, the formal schools and apprenticeships of an earlier era featured many practical arts and crafts. Japan has been an active advocate of Multiple Intelligences for over a decade; however, Gardner believes that the Japanese population is somewhat hesitant to recognize and honor individual differences due to cultural issues. To date, there is no knowledge of Multiple Intelligences schools or a Multiple Intelligences society in France. Gardner attributes the lack of Multiple Intelligences in France to the possibility that the French were the creators of the IQ test. Multiple Intelligences advocate Michaela Singer of Romania is responsible for the spread of MI. Gardner’s works are readily available in Scandinavia and the Netherlands, in Swedish, Danish and English languages. It appears as though European societies were more accepting of the concept of Multiple Intelligences. Educators and administrators in India were very receptive and welcoming of MI, also. Gardner states that many people continued to contact him from the Middle East, including from Iraq and Iran, but noted there was not much interest at the ministry or publication level except in Israel.

In essence, Multiple Intelligences can be used in the classroom to ensure a plurality of teaching approaches to better reach all students as well as to provide a more rounded understanding of the topic (Chen et al., 2009). Multiple Intelligences can be a useful vehicle for broadening educational horizons as well. Schools can include subjects that address the several intelligences and ways of thinking, as well as teaching methods that
speak to individual differences and assessments that go beyond the standard traditional methods. By teaching to the individual students instead of teaching to a test or specific method of assessment, students may become more productive learners, and essentially more effective adults. With all the funding and resources today and reviewing the numerous reforms over the course of history, Multiple Intelligences theory incorporation within the classroom may be the answer to the issues facing public education presently—raising test scores and decreasing drop-out rates.
CHAPTER III

METHODOLOGY

Overview

This quasi-experimental longitudinal study was conducted to determine if teaching students the definition of Multiple Intelligences and offer ways to implement them in an academic setting would predict academic achievement, thus exploring causality. The purpose of this study was to determine if Multiple Intelligences had any effect on academic achievement. Within this study, the researcher gathered data and examined if the specific participants’ tenth grade GPAs decreased or increased each year over a two year time period when the MI strategy was implemented in eighth grade in 2007. This study collected data only from students who had been introduced to Multiple Intelligences using the same techniques and strategies by the researcher in the original 2007 study.

The presentation of the prior chapter attempted to offer a brief overview of pertinent research concerning issues associated with the variables associated with this research study. Lack of student knowledge of the Multiple Intelligences in the classroom may have been caused by any number of reasons and the possible effect on student achievement was presented in this study. Issues surrounding student grade point averages may have included factors outside of school, as well as within.

This chapter attempted to set the parameters as to how this possible link between pertinent variables was achieved. An explanation was included of participants, procedures and the instrumentation of the collection of data analyzed and was presented in chapter four of this study. Seventh grade students’ test scores in the core classes such
as mathematics, science, English and social studies was collected, compiled, and analyzed with respect to the variable sub-groupings.

The basic outline of steps of execution for this research was as follows:

Step 1: Based upon an examination and analysis of already existing literature related to the links between student achievement and the effects of students taught using Multiple Intelligences in the classroom was the basic scope of the research study was established.

Step 2: Given the parameters delineated in step one, an overview of the pertinent research and data was presented in the previous chapter of this study.

Step 3: The appropriate permissions were obtained from the intended schools district that was the source of data analyzed in this study. (See Appendixes D and E). Also, the appropriate review and clearance was granted from the university’s Institutional Review Board from which this research study was sponsored. (See Appendix B and C).

Step 4: The collected data was analyzed through utilization of the SPSS statistical analysis software, appropriate data analysis was produced and presented in the following chapter. The specific statistical analysis utilized through the SPSS software was a t test as well as other functions of the program that produce descriptive data. Conclusions and recommendations based upon this quantitative statistical analysis were presented in the final chapter of this study.

Research Design

The independent variables were race, age, socioeconomic status, living with one or both parents, and outside interests such as athletics or music. The dependent variable was GPAs. The variables, with the exception of race, were collected two times; at the
beginning and at conclusion of the study. Race was only collected once, as it would not change.

Participants

The participants involved were comprised of male and female students between 14 and 16 years of age. The total sample was comprised of 115 students of various ethnicity, gender, and socioeconomic backgrounds. The socioeconomic levels of all participants’ parents/guardians ranged from low to high.

This study was conducted at an urban public school in the South and was limited to six eighth grade U.S. History classes. The initial 2007 study was conducted throughout one school year. Only participants who began and ended the school year were included in the total number of 2007 participants \( n=115 \). In the original 2007 study, the theory of Multiple Intelligences was used to enrich students’ knowledge in U.S. History classes and produced an end result of a significant increase in academic achievement.

This 2009 study was conducted using only information of the initial participants included in the 2007 study. Cumulative records of these participants were utilized for information regarding their ninth and tenth grade GPAs, socioeconomic status, gender, ethnicity, and family composition. Surveys (Appendix F) were conducted to obtain information about non-school related activities between grades 8 and 10.

Instrumentation

The primary data collection method was a survey that may take the students approximately 15 minutes to complete. The survey was a 20 question survey based on a 5-point Likert scale with answers ranging from \textit{strongly disagree} to \textit{strongly agree} and consisted of several descriptor questions and questions related to student feelings toward Multiple Intelligences, their past and present interests, their academic performance, and
factors that may have influenced educational decisions over the last 2 years. The survey attempted to answer questions pertaining to the students’ attitudes about the effectiveness of the implementation of Multiple Intelligences and identify weaknesses of the strategy.

The survey was constructed by the researcher and also provided to a panel of experts for revisions, and was corrected accordingly. It was then distributed to a pilot group. The pilot survey was revised and assessed for validity and reliability. Once that was established, it was revised and distributed to the participants in the study through their English Composition II class. Results were collected by the researcher and tabulated using SPSS data analysis. There was no consequence toward those students who chose not to participate. The survey was distributed during the first week of August. Responses did not infringe on privacy of the participants as names were not required. All returned surveys are kept confidential. Students not participating were engaged in class assignments. All respondents returned the completed survey to the English II teachers involved with the distribution, and the researcher collected the returned instruments. Data results were analyzed with the use of SPSS.

Data Collection Procedures

Prior to the beginning of the 2009-2010 school year, the researcher secured permission from the building principal as well as the current superintendent and in accordance with the school district’s policies and procedures to continue the longitudinal study which was begun in 2007. Permission to access and utilize the required data for this research study was obtained through the Institutional Review Board in 2007 (Appendix B) and an extension was submitted and approved in 2009 (Appendix C); the supervising principal of the school in which the survey was conducted (Appendix D); student assent and parental consent forms.
Following were the steps taken for original data collection in the 2007 study:

Step 1: The researcher analyzed final grades in all core subject areas of seventh grade students, tabulated seventh grade students’ GPA according to gender in the core classes, and compared seventh and eighth grade students’ final GPAs in 2007.

Step 2: The researcher explained Multiple Intelligences and conducted self-assessment, administered the Teele Multiple Intelligences Inventory (TIMI) (Appendix G).

Step 3: The researcher incorporated the MI strategy into U.S. History objectives.

Step 4: Students involved in athletics, drama, and choir or musical activities were identified.

Step 5: At the end of the 2006-2007 school year, eighth grade averages were compared to the 2005-2006 seventh grade averages. All averages are compared in the final 2009 study.

Step 6: Students’ self-assessments were completed and qualitative interviews with colleagues were conducted at the conclusion of the 2007 study; and again in the 2009 study.

Step 7: Data was compiled from cumulative folders of participants and tabulated according to SPSS data analysis.

Delimitations

The original 2007 research study has a limited population from which information was obtained. The initial 2007 information was drawn from the records of one seventh grade class from a small southeastern state, and consisted of 115 students who have completed the state of Mississippi objectives for the seventh grade year. The 2009 study included only 94 of the original 115 participants, as some students were retained and some relocated.
The conclusions drawn from this research study in 2009 may also be limited by the scope and breadth of the research sources examined and contained in the research base of the proposed study. Inherent limitations may exist in the study in that there may be other research and data that may have strong influence upon the research findings, but are unknown to the researcher at the onset of the investigation.

Another limitation may be the very nature of the research method being a single case study, in that it may pose some challenges to the external validity of findings.

Data Analysis

Scores were evaluated using a $t$ test to determine whether the means of the two time periods which information is obtained from the participants are significantly different from one another.

The hypotheses are:

$H_01$: There will be no statistically significant difference among specific students at the end of their 8th and 10th grade school years with regard to grade point averages (GPAs).

$H_02$: There will be no statistically significant difference among specific students’ involvement in music, athletics, choir, and drama at the end of their eighth and tenth grade school years, respectively.

Summary

It was the purpose of this chapter to give an overview of the general procedures and methodology utilized in the execution of this research study. In this chapter the target participation sample, manner of instrumentation, procedures of data collection, hypotheses, and form of data analysis were presented. The following chapter sought to give a full statistical analysis of the data after the aforementioned procedures were approved and executed.
This chapter included the subjects of study, the instruments used to measure student achievement, procedures, and collection of data analyzed. Conclusions were drawn about U.S. History and the possible impact of Multiple Intelligences in the classroom setting by the researcher. Data was collected and analyzed with respect to various subgroups — students’ increase in progressive academic achievement, the effect of Multiple Intelligences and the significant role they may have played on academic standing when implemented in a history classroom, and students’ self assessment of the impact of Multiple Intelligences. The recognition of this study may possibly benefit students inside and outside of the classroom setting. Students could possibly be more productive in the personal and academic growth not only in U.S. History but in all subjects when utilizing the information obtained through this study. This study may assist students in expanding their knowledge in a multitude of ways making them more productive life-long learners.
CHAPTER IV
SUMMARY OF RESULTS

The purpose of this study was to determine if Multiple Intelligences had an effect on academic achievement in students. Within this study, the researcher gathered data and examined the specific participants’ grade 10 grade point averages (GPAs) to assess if they have decreased or increased each year over the two year time period since implementation of the Multiple Intelligences strategy in eighth grade in 2007. The focus of this work was to examine the possibility of an increase in students’ grade average of U.S. History objectives after implementation of Multiple Intelligences strategies. The study showed the evidence of academic improvement in U.S. History as well as other subject areas to be significant. This study also showed that by providing students the necessary skills through Multiple Intelligence (MI) strategies to assist in understanding the significance of U.S. History, an increase in students’ U.S. History grades occurred.

Summary of Data

The question guiding this study sought information as to what academic measurable outcome was evident at the end of a two year study when students were made aware of their Multiple Intelligences in 8th grade and taught how to utilize them in all subject areas. Their academic progress was then tracked throughout their ninth and tenth grade years. To answer the guiding question, a preface to the study was set. Step 1 of implementation of Multiple Intelligences strategies was integrated into the U.S. History objectives in the initial 2007 study. Before students began their eighth grade experience of the inclusion of Multiple Intelligences within the subject of U.S. History, the researcher gathered data from the seventh grade averages of the core subjects to plan the schemata for the new school year with these students.
In the original study concluded in 2007 of 109 participants, the current 2009 study only included 94 participants. Exclusions in the final study in 2009 were eight students who had repeated one or more grade levels, and seven students who were not enrolled in the school system within the 2 years after the study had begun. Of the 94 participants within the study, there were 50 male participants and 44 female participants.

The first data analyzed in the initial 2007 study were the final grades in all core subject areas of the participants as seventh grade students (see Table 1). Grades were formulated in all five core subject areas. The seventh grade participants’ final grades in English, Math, History, Reading, and Science were totaled and averaged. The highest average was in the area of Reading with an average of 86.38 points. History was the second highest with 86.02 points. Note the close proximity of Reading and History averages, differing in only .36 of a point. The data collected gave the researcher insight as to the primary subject of interest for the participants. The lowest average in the area of Math was 83.29 points. When the highest to lowest final averages were compared, results showed a difference of 3.09 points. These data were used to compare summative grades at the end of the participants eighth grade year after the implementation of Multiple Intelligences, then compared with data of the participants tenth grade final GPAs to assess the increase or decrease of academic achievement over a two year time span.
Table 1

7th Grade Final Averages in Core Classes and Total GPA

<table>
<thead>
<tr>
<th>Subject</th>
<th>Final Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>85.69</td>
</tr>
<tr>
<td>History</td>
<td>86.02</td>
</tr>
<tr>
<td>Math</td>
<td>83.29</td>
</tr>
<tr>
<td>Reading</td>
<td>86.38</td>
</tr>
<tr>
<td>Science</td>
<td>85.27</td>
</tr>
<tr>
<td>Total GPA</td>
<td>1.86</td>
</tr>
</tbody>
</table>

*Note: The grading scale is based on the following: 100-95 = A; 94-85 = B; 84-75 = C; 74-70 = D; 69 and below = F.*

The grading scale for the participants’ school district shown above was based upon a 100 point scale. In the original 2007 study the question posed was “What academic measurable outcome is evident when eighth grade students are aware of and utilize their multiple intelligences within a U.S. History classroom?” Results concluded that with the incorporation of Multiple Intelligences in U.S. History subject matter, it was thought to have had more relevance to the students because they were able to implement the tools (or use MI) immediately. Table 2 shows a comparison made between the seventh and eighth grade students’ final GPAs. GPAs increased from 1.86 in the seventh grade to 1.90 in the eighth grade. The increase was .04 of a point. This increase is thought to be a result of the implementation of Multiple Intelligences.
Table 2

*Comparison of GPA’s over the course of 1 year*

<table>
<thead>
<tr>
<th>Grade</th>
<th>Final Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>7th Grade</td>
<td>1.86</td>
</tr>
<tr>
<td>8th Grade</td>
<td>1.90</td>
</tr>
</tbody>
</table>

Table 3 shows the increase per subject area and percentages of participants. The largest number of students who increased did so in the subject areas of Social Studies and Science, respectively. The lowest was English/Language Arts, with an increased percentage of 18.1. The subject of English/Language Arts was the only area that did not show significance when data was ran. \{F(1,87) = .049, p=.825  with \eta^2 = .001.\}

Increases in the other subjects ranged from highest to lowest, 30.9 percent to 18.1 percent which did prove significant. Even though English was not significant in the final 2009 study, all subject areas did prove to have an increase from the initial study conducted in 2007.
Table 3

10th Grade Final Averages in Core Classes and Total GPA

<table>
<thead>
<tr>
<th>Subject</th>
<th># Increased in Subject Area</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>37</td>
<td>18.1</td>
</tr>
<tr>
<td>History</td>
<td>63</td>
<td>30.9</td>
</tr>
<tr>
<td>Math</td>
<td>46</td>
<td>22.5</td>
</tr>
<tr>
<td>Science</td>
<td>58</td>
<td>28.4</td>
</tr>
</tbody>
</table>

As shown in the Descriptive Statistics Comparison of 8th and 10th grade GPAs in Table 4, there was a significant increase in the adjusted mean GPAs of 10th graders at the end of the two year study. The first hypotheses was tested and rejected based on data results. Ho: There will be no statistically significant difference among specific students at the end of their 8th and 10th grade school years with regard to grade point averages (GPAs). Pillai’s Trace was conducted on this data and the F(1,88) = 5.848, p=.018 which shows significance, with an effect of .06. Although the effect size was small, significance was found in the initial conduction of the t-test, the researcher was led to seek information from individual subject grades to assess which areas were significant and which were not in the adjusted mean of 8th grade at 86.00 and 10th grade being 86.23 at a 95% confidence interval.
Table 4

*Descriptive Statistics of Comparison of 8th and 10th grade Adjusted Means*

<table>
<thead>
<tr>
<th>Subject</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>8th Grade GPA</td>
<td>86.00</td>
<td>6.60</td>
</tr>
<tr>
<td>10th Grade GPA</td>
<td>86.23</td>
<td>7.81</td>
</tr>
</tbody>
</table>

Figure 1 shows student involvement in individual activities such as Athletics and Music in 2009 from the initial 2007 study, yet, students who were involved in both Music and Athletics, and students who were not involved in either of the activities. Figure 1 is indicative of the second hypotheses and was rejected based upon results of the data. Ho2: There will be no statistically significant difference among specific students’ involvement in music, athletics, choir, and drama at the end of their eighth and tenth grade school years, respectively. The decrease in Athletics over the two year time period totaled 10 percent. The decrease in Music was smaller at a rate of 6 percent. This indicates that as students’ age went up, their interests flourished in participating in both (increase of 11 percent), or decided to pursue neither option (differing 5 percent).
After examining Tables 1-3 and Figure 1, the researcher chose to probe into possibilities for the changes in academic achievement. The first item for review was student absences (See Table 5). Absences were comparable in both the 9th and 10th grade with a total of 97 in the 9th grade and a total of 95 in the tenth grade. The most commonly missed number of days by both 9th and 10th graders was between 0-4. Low absences may possibly have some relevance in increases in academics. If student attendance is present, possibly academic achievement could be more productive.
Table 5

*Absences 9th grade, Absences 10th grade*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absences in 9th grade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-4</td>
<td>51</td>
<td>9.9</td>
</tr>
<tr>
<td>5-10</td>
<td>31</td>
<td>6.2</td>
</tr>
<tr>
<td>11-15</td>
<td>6</td>
<td>1.2</td>
</tr>
<tr>
<td>16-20</td>
<td>6</td>
<td>1.20</td>
</tr>
<tr>
<td>21-25</td>
<td>1</td>
<td>.20</td>
</tr>
<tr>
<td>26-30</td>
<td>1</td>
<td>.20</td>
</tr>
<tr>
<td>31-35</td>
<td>1</td>
<td>.20</td>
</tr>
<tr>
<td>Absences in 10th grade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-4</td>
<td>51</td>
<td>10.20</td>
</tr>
<tr>
<td>5-10</td>
<td>29</td>
<td>5.80</td>
</tr>
<tr>
<td>11-15</td>
<td>9</td>
<td>1.80</td>
</tr>
<tr>
<td>16-20</td>
<td>4</td>
<td>.08</td>
</tr>
<tr>
<td>21-25</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>26-30</td>
<td>2</td>
<td>.04</td>
</tr>
<tr>
<td>31-35</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The next item analyzed in Table 6 was the courses which were taken by the participants during their tenth grade school year. Course choices are generally based upon the need for Carnegie units required for graduation.
The largest percentage (31.1) of students participated in the Accelerated (AP) courses. Out of the total number of participants, 32 participants were considered “AP course” students. The second largest was the course of Art with 24.3 percent, and a total of 25 students. Music and Special Education were found to be at the same percentage of 8.7. Theatre had the lowest number of participants with only 6 included for a percentage of 5.8. This is indicative of the students’ interests other than academics.

Table 6

*AP Classes, Art, Music, Special Education (SPED), Theatre*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP Classes</td>
<td>32</td>
<td>31.1</td>
</tr>
<tr>
<td>Art</td>
<td>25</td>
<td>24.3</td>
</tr>
<tr>
<td>Music</td>
<td>7</td>
<td>8.8</td>
</tr>
<tr>
<td>SPED</td>
<td>7</td>
<td>8.8</td>
</tr>
<tr>
<td>Theatre</td>
<td>6</td>
<td>5.8</td>
</tr>
</tbody>
</table>

Table 7 analyzed the gender and ethnicity of each of the participants included in this study. There were a total of 50 female and 44 male participants compiled within this study. The most predominant ethnicity was Caucasian at 60.2 percent. The second largest number was of Black participants with 23.3 percent. Hispanic and Asian were next with 9 and 7 percent respectively, and the lowest percent (1) was Native American.
Table 7

*Ethnicity, Gender*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>7</td>
<td>6.8</td>
</tr>
<tr>
<td>Black</td>
<td>24</td>
<td>23.3</td>
</tr>
<tr>
<td>Caucasian</td>
<td>62</td>
<td>60.2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>9</td>
<td>8.7</td>
</tr>
<tr>
<td>Native American</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>50</td>
<td>49.5</td>
</tr>
<tr>
<td>Male</td>
<td>44</td>
<td>43.7</td>
</tr>
</tbody>
</table>

In Table 8 the researcher explored the possibility that due to the primary location’s close proximity of the military base and there is an influx of students entering and withdrawing had relativity to the significant increase. Student’s who do not live within the specified area close to the school and are designated to attend another school district may also attend the school district within this study if a parent or legal guardian pays tuition to attend. After reviewing the data, the researcher does not believe that either of these variables had any influence on the significance of the data.
Table 8

*Military, Tuition*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Military</td>
<td>7</td>
<td>6.8</td>
</tr>
<tr>
<td>Tuition</td>
<td>1</td>
<td>1.0</td>
</tr>
</tbody>
</table>

The number of participants who played sports as shown in Table 9 was not as large as those who were enrolled in the credited course of Physical Education during the 10th grade school year. At 26.2 percent, this alludes that sports does play a factor in over 25 percent of the participants lives.

Table 9

*Sports, Physical Education (P.E) in 10th grade*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sports</td>
<td>27</td>
<td>26.2</td>
</tr>
<tr>
<td>PE</td>
<td>17</td>
<td>16.5</td>
</tr>
</tbody>
</table>

The data of the participants’ residency in Table 10 was collected and compiled and the information concluded that 59 of the participants resided with 2 parents. The participants’ inclusions in establishing the residency of a two-parent household were limited to both biological parents of the participants. The single-parent households to which the
participants resided were totaled at 43; which accounted for living with only one biological parent. No students who participated in the study were found to reside with foster parents, have been adopted, or lived with relatives other than biological parents. Of those single and two parent households, the most common socioeconomic status found was that of free lunch participants, which indicates low economic level of the participants’ parent income. The specific participants included compiled 34 percent of whom food services were provided free of charge, and 12 percent who were offered assistance. Almost half of the participants’ parents’ income was low enough to qualify for assistance with food provisions during the school day. 45.6 percent of the participants paid full price for lunch.

Table 10

*Resides with 1 parent, Resides with 2 parents, SES Status*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resides with 1 parent</td>
<td>43</td>
<td>41.7</td>
</tr>
<tr>
<td>Resides with 2 parents</td>
<td>59</td>
<td>57.3</td>
</tr>
<tr>
<td>SES Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free</td>
<td>35</td>
<td>34.0</td>
</tr>
<tr>
<td>Paid</td>
<td>47</td>
<td>45.6</td>
</tr>
<tr>
<td>Reduced</td>
<td>12</td>
<td>11.7</td>
</tr>
</tbody>
</table>

Once determination was made of student’s socioeconomic status and with whom they resided, the education level of each parent (see Table 11) was thought to possibly hold
some importance, therefore data was collected and compiled. Thirty-six of the 94 participants surveyed stated their mother had completed high school, and 24 of those 36 went on to pursue a college education. Twenty percent received their General Equivalency Diploma (GED) and a total of 15 percent accounted for those who completed Junior High School and those who did not know what education level their mother had achieved. 25 percent of the participants’ mothers’ attending college led the researcher to believe that this specific percent felt education to hold some importance; therefore this information may play a factor in the academic significance found in the study.

The father’s education level was also compiled and data was tabulated. Of this information, 29 participants’ fathers’ completed High School and of those 29, 13 attended college, less than that of the mothers. Eleven completed Junior High School and 23 received their GED. Nineteen percent stated they were unsure of what education level was completed by their father. When comparing the education levels of the father and the mother, higher results existed of the mother, which indicate that mother’s may have a more significant impact on the education of the participants included in this study.
Table 11

*Mother’s education level, Father’s education level*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother’s Level of Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jr. High</td>
<td>7</td>
<td>7.4</td>
</tr>
<tr>
<td>High School</td>
<td>36</td>
<td>38.3</td>
</tr>
<tr>
<td>GED</td>
<td>19</td>
<td>20.2</td>
</tr>
<tr>
<td>College</td>
<td>24</td>
<td>25.5</td>
</tr>
<tr>
<td>I Don’t Know</td>
<td>8</td>
<td>8.5</td>
</tr>
<tr>
<td><strong>Father’s Level of Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jr. High</td>
<td>11</td>
<td>11.7</td>
</tr>
<tr>
<td>High School</td>
<td>29</td>
<td>30.9</td>
</tr>
<tr>
<td>GED</td>
<td>23</td>
<td>24.5</td>
</tr>
<tr>
<td>College</td>
<td>13</td>
<td>13.8</td>
</tr>
<tr>
<td>I Don’t Know</td>
<td>18</td>
<td>19.1</td>
</tr>
</tbody>
</table>

Because the participants study began in the 8th grade and concluded in the 10th grade, the researcher felt the need to analyze any changes which may have occurred within the family composite over the two year period. Within the duration of the study, Table 12 shows that 29 participants dealt with divorce, 6 dealt with the death of a parent, 17 dealt with a re-marriage, and 15 were subject to a new family member addition (birth). Only 27 participants’ family composite remained the same as when it began in the 2007 study.
Table 12

*Family make up changes since 8*<sup>th</sup> *grade*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divorce</td>
<td>29</td>
<td>30.9</td>
</tr>
<tr>
<td>Death</td>
<td>6</td>
<td>6.4</td>
</tr>
<tr>
<td>Re-Marriage</td>
<td>17</td>
<td>18.1</td>
</tr>
<tr>
<td>Birth</td>
<td>15</td>
<td>16.0</td>
</tr>
<tr>
<td>None</td>
<td>27</td>
<td>28.7</td>
</tr>
</tbody>
</table>

In Table 13, data for the activities in 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> grade were tabulated and analyzed. The category of Sports in each of the 3 years was the highest area of interest. Over half of the participants in the study participated in sports. Although the number of participants declined each year successively, sports were always the most dominant activity. The second largest category of activities students were involved in each year was Band. Band, like that of Sports, experienced a decline in participants each year successively. Choir was the next highest each year, but as did Band, and Sports, also experienced decline each year. Drama was not offered to the participants in the 8<sup>th</sup> grade, but was offered however, in the 9<sup>th</sup> and 10<sup>th</sup> grade years, and therefore, it is concluded that this may be a possible explanation for the low number of participants in this category. Students who did not participate in any category were compiled and declined each year as well.
Table 13

*Activities in 8th grade, Activities in 9th grade, Activities in 10th grade*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activities in 8th grade</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sports</td>
<td>65</td>
<td>46.4</td>
</tr>
<tr>
<td>Band</td>
<td>25</td>
<td>17.9</td>
</tr>
<tr>
<td>Drama</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Choir</td>
<td>18</td>
<td>12.9</td>
</tr>
<tr>
<td>None</td>
<td>32</td>
<td>22.9</td>
</tr>
<tr>
<td><strong>Activities in 9th grade</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sports</td>
<td>61</td>
<td>49.6</td>
</tr>
<tr>
<td>Band</td>
<td>18</td>
<td>14.6</td>
</tr>
<tr>
<td>Drama</td>
<td>7</td>
<td>5.7</td>
</tr>
<tr>
<td>Choir</td>
<td>13</td>
<td>10.6</td>
</tr>
<tr>
<td>None</td>
<td>24</td>
<td>19.5</td>
</tr>
<tr>
<td><strong>Activities in 10th grade</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sports</td>
<td>52</td>
<td>55.3</td>
</tr>
<tr>
<td>Band</td>
<td>12</td>
<td>12.8</td>
</tr>
<tr>
<td>Drama</td>
<td>4</td>
<td>4.3</td>
</tr>
<tr>
<td>Choir</td>
<td>7</td>
<td>7.4</td>
</tr>
<tr>
<td>None</td>
<td>19</td>
<td>20.2</td>
</tr>
</tbody>
</table>
With all data shown above within the Tables and Figure, the researcher chose to survey the number of participants who remembered learning about the Multiple Intelligences in the 8th grade, those who used them in the 8th grade, and those who utilized the information about the Multiple Intelligences since the 8th grade (see Table 14). Ninety-six percent strongly agreed they learned about the Multiple Intelligences in the 8th grade. Of that 96 percent, 83 percent agreed they used Multiple Intelligences in the 8th grade and 85 percent agreed that Multiple Intelligences were utilized since the introduction in the 8th grade. No participants strongly disagreed in the survey regarding the introduction of, neither the implementation of, nor the utilization of Multiple Intelligences since the introduction in 2007. Five percent disagreed about the use of MI in the 8th grade; and 6 percent disagreed about usage of the Multiple Intelligences since 8th grade.

Table 14

_Students remember learning MI in 8th grade, Students used MI in 8th grade, Student’s application of MI since 8th grade_

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students remember learning MI in 8th grade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>90</td>
<td>95.7</td>
</tr>
<tr>
<td>Agree</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Don’t Know</td>
<td>4</td>
<td>4.3</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 14 continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students used MI in 8th grade</td>
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<tr>
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<td>58</td>
<td>61.7</td>
</tr>
<tr>
<td>Agree</td>
<td>21</td>
<td>21.3</td>
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<tr>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Students’ application of MI since 8th grade</td>
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<tr>
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<td>60</td>
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<tr>
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<tr>
<td>Strongly Disagree</td>
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</tr>
</tbody>
</table>

GPAs at Each Grade Level

To make a comparable observation of the participant’s grade point averages, each of the grade levels involved must be included in the study. Because the study began when the participants had completed the 7th grade school year, this was the starting point chosen by the researcher. Progression is shown throughout the completion of the 8th grade school year, but only after Multiple Intelligences was introduced and implemented within the participants U.S. History course. Results below are provided for the conclusion
of the 9\textsuperscript{th} and 10\textsuperscript{th} grade also. The end of the participant’s 10\textsuperscript{th} grade school year was the concluding point for the researcher, thus providing comparison for all grade levels present throughout the study. As shown in Table 4 an increase was shown in the adjusted mean from the participants 8\textsuperscript{th} grade year (after implementation of the Multiple Intelligences) to the conclusion of the study at the end of their 10\textsuperscript{th} grade year.

Comparison of Core Subject Data

At the origin of this study, the researcher used the above 7\textsuperscript{th} grade data to compare with the concluding 8\textsuperscript{th} grade data. This data was tracked and progression in each subject area was compiled concluding at the end of the participant’s 10\textsuperscript{th} grade school year. At the end of the participant’s seventh grade school year, the highest mean was in the subject area of Reading with 87.55 and a standard deviation of 7.44. In their 8\textsuperscript{th} grade year Reading had a mean of 85.32 and standard deviation of 7.98. Reading is not offered after the 8\textsuperscript{th} grade so progression was not able to be tracked throughout the conclusion of the study.

History Means

As for the comparable subject areas, in 7\textsuperscript{th} grade, History was highest with a mean of 85.57 and standard deviation of 8.07. In 8\textsuperscript{th} grade History was the second highest with these participants with a mean of 86.43 and a standard deviation of 8.39. The same participants, as 9\textsuperscript{th} graders were highest in the subject area of History with a mean of 85.20 and a standard deviation of 8.44. As the participants conclusion of the 10\textsuperscript{th} grade year History was the second highest with a mean of 84.29 and a standard deviation of 10.96. At the conclusion of the study, when data was ran in History, Pillai’s Trace was found to be significant with $F(1,87) = 3.93$, $p=.05$. 
Science Means

7th grade Science had a mean of 86.20 and a standard deviation of 8.14. The participants, as 8th graders were highest in the subject area of Science with a mean of 87.18 and a standard deviation of 7.31. Second highest once again with these participants as 9th graders was Science with a mean of 84.43 and a standard deviation of 8.56. As 10th graders, the third highest subject area was Science with a mean of 83.27 and a standard deviation of 9.83. In Science, Pillai’s Trace was found to be significant with \( F(1, 86) = 6.65, p = .012 \).

English/Language Arts Means

As 7th grader, the third highest was English/Language Arts with a mean of 86.13 with a standard deviation of 7.65. During the participant’s 8th grade year English had a mean of 86.29 and a standard deviation of 8.02. Third highest as 9th graders was English with a mean of 83.56 and a standard deviation of 8.80. At the conclusion of the study, the data was complied of their tenth grade school year and compared with data previously gathered. The highest in the subject area at the conclusion of the study during the participants 10th grade school year was English with a mean of 85.00 and a standard deviation of 7.67. The subject of English/Language Arts was the only area that did not show significance when data was ran with an \( F(1, 87) = .049, p = .825 \) with \( \eta^2 = .001 \).

Math Means

Lastly for the participants as 7th graders Math with a mean of 84.34 and a standard deviation of 9.54. In 8th grade, once again Math was the lowest with a mean of 84.33 and standard deviation of 8.30. Fourth in 9th graders was Math with a mean of 81.31 and standard deviation of 9.14. Consistently last was the subject area of Math with a mean of
83.21 and standard deviation of 10.22. In Math, when data was ran, Pillai’s Trace was found to be significant with \( F(1,87) = 10.36, \ p=0.002 \) exhibiting a significant increase.

**Overall Means**

The grade 7 GPA mean was 86.15 with a standard deviation of 7.57. The grade 8 GPA mean was 85.90 and standard deviation of 6.53. The grade 9 GPA mean was 85.51 and standard deviation of 8.20. The grade 10 GPA mean was 85.98 and standard deviation of 7.77.

**Comparison of Data**

One consistency between all 4 data sets was that the History means were among the top 2 each year. Another was that Math was the lowest mean in all 4 grades. Reading was no longer offered as an option for credited coursework after 8\(^{th}\) grade. Prior to 8\(^{th}\) grade the subject area of Reading was required, however, after 2008, it was removed as a requirement for incoming 8\(^{th}\) grade students and offered only as an elective. Also, in the 2007 school year, the school wide reading program named “Reading Renaissance” was also removed and replaced with a school wide mentoring program. The mean GPA was highest among participants in the 10\(^{th}\) grade after implementation and inclusion of Multiple Intelligences. The adjusted mean comparison shows the increase in Table 4.

**Conclusions**

The research conducted in this longitudinal study was designed to determine if there was a measurable outcome evident when students are aware of and utilize their multiple intelligences over the course of time. The quantitative research aspects of this project indicated that students’ grade averages increased and may be a result of the integration of Multiple Intelligence strategies taught and implemented during the participants 8\(^{th}\) grade school year. A significant increase was shown in the participants at the conclusion of
their 10\textsuperscript{th} grade school year when analyzing grade point averages. Qualitative evidence gathered in the 2007 study through teacher interviews of educators at the end of the students’ 8\textsuperscript{th} grade school year indicated that students would continue to utilize methods of study that focused on their strengths. At the conclusion of the initial 2007 study, all reading content area teachers were in agreement that a change was apparent in the participants included in the researcher’s U.S. History classroom, as opposed to those who were not taught by the researcher. When asked what observations were apparent within students involved in the study, the reading teachers’ answers were the students’ attitudes toward work ethics and reasoning skills. One teacher conveyed her surprise to student’s response to a project given, as they asked if they could do it a different way, but producing the same outcome. The teacher stated that she asked the student why they wanted to do this, and their response was that they would get more out of the project if they did it a different manner. She said the students mentioned their preferred Multiple Intelligences of which they had just learned. This was not the only case in which students asked to vary their assignments, as one teacher said her students were assigned the task of teaching a unit, and a group of students also in the researchers’ class asked if they could teach the assignment using different techniques. She stated that this was the most creative response that any of her classes had ever responded to a lesson. Two teachers said they had noticed students making flashcards and peer quizzing of the spelling words and vocabulary lessons, although these were not techniques the teachers had taught or even suggested to them. The students took it upon themselves to study in the fashion in which they learned best.

All reading teachers of the initial 2007 participants did state that students they taught in their Reading course classrooms who were also participants in the study did achieve
better grade averages in reading class than the students who were not involved in the study. The new reading subject area teachers alluded to the researcher that they would like more information on the Multiple Intelligences to impact their own classes in the following years. This information showed that students were capable of utilizing the Multiple Intelligences within any classroom and be academically successful. This information leads the researcher to believe that the inclusion of Multiple Intelligences during the participants 8th grade school year may have had some impact in the significant increase of the final averages.
CHAPTER V
DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Discussion

In the current times of economic recession, additional education reform and budget cuts are on the horizon. Since revenue from the Land Ordinance of 1785 allowed the creation of the first public school funding, an abundance of monies over the decades has been allocated for the sole purpose of education. A driving question for districts, states, legislators, and presidents alike is what will it take to be more productive in educating today’s children? Because drop-out rates are steadily increasing and test scores are at a lower percentage than ever before, the much needed additional answers are being sought.

Research alludes that factors connected to variables such as gender, age, learning styles, instructional styles, and economic standing may or may not influence student achievement (MDE, 2008a). Although these factors were found to have an impact on increased student achievement, the responsibility to examine and analyze and utilize these data to best serve the educational needs of the student lies heavily on the institutions of public education.

The researcher concludes the incorporation of the Multiple Intelligences (MI) theory would be more cost effective and funding would be necessary only for additional supplies and teacher and administrator training. Multiple Intelligences focus on teaching to a child’s needs and producing a life-long learner rather than teaching to a test. Education today has more funding, more resources, and more guidelines and rules directing its educational programs; yet data concludes that there are not better test results, possibly because of the lack of focus on teaching the individual. This study sought to examine the variable of the Multiple Intelligences theory and its connection to student achievement.
The purpose of this study was to examine if an increase was apparent in students’ grade average of the core subject areas in the 10th grade after implementation of Multiple Intelligences strategies in the 8th grade. Although others such as Hickey (2004), Sternberg (1994), Campbell (1997), and Kornhaber (2001) have conducted numerous studies of the use of Multiple Intelligences integrated in the classroom setting in the past, no study was found that had ever been conducted over a two year period and student progress tracked. This longitudinal study showed evidence of academic improvement in U.S. History as well as other subject areas to be significant. This study also showed that by providing students the necessary skills through Multiple Intelligence (MI) strategies at the middle school level, it may have led to the increase in students’ academic achievement in high school years.

States such Alabama, California, Canada, Connecticut, Florida, Indiana, Iowa, Michigan, Missouri, New York, North Carolina, Oregon, Utah, Virginia, and Washington and numerous others worldwide have found Multiple Intelligences to be worthy of inclusion in their educational progress, as they are implementing Howard Gardner’s Multiple Intelligences theory. Visiting schools across the nation have found Multiple Intelligences to foster and enhance creativity in their children and have incorporated these strategies into their curriculum when they returned home. The Key Learning Community in Indiana received enormous coverage as it was featured on ABC News and in Newsweek, where many educators were exposed to the MI ways of thinking. Because Multiple Intelligences offer a cross-cultural approach in the field of education, and many educational practitioners in countries such as China, Japan, the Philippines, South Korea, Norway, Argentina, Australia, Denmark, England, Ireland, Scotland, Romania, Turkey, and Colombia join in this educational endeavor. Countries such as these have chosen to
embrace the multitude of facets that contribute to intellectual and cultural life to produce a healthy student as well as a person.

In their 2009 work, Chen, Moran, and Gardner agree the MI theory supports and celebrates the diversity of children's strengths in school and other learning environments. For a school in public education to be successful, implementation appears more a need instead of a possibility. It has been over a quarter of a century after the origin of Multiple Intelligences and yet this theory is now widespread throughout the world and is applied in the international arena. With the ever-growing diverse population that public schools are dealing with in today’s society, Multiple Intelligences serves as a valuable asset for both teachers and administrators (Chen et al., 2009). Chen et al. (2009) focuses on how the experiences of exam-driven countries like China and Japan will prove instructive. Japan has been an active advocate of Multiple Intelligences for over a decade; however, Gardner believes that the Japanese population is somewhat hesitant to recognize and honor individual differences due to cultural issues. Although this is their belief, those of Japanese culture still find the Multiple Intelligences to be instrumental in the educational process.

The participants in this study began as incoming 8th graders and during that time, were introduced to Multiple Intelligences and learned how to utilize strategies in the subject area of U.S. History. Throughout the participant’s 8th grade school year, these Multiple Intelligences strategies were incorporated and progress was recorded. At the end of the 8th grade school year, GPAs of the males increased from 1.86 in the seventh grade to 1.87 in the eighth grade. The increase was .01 of a point. The seventh grade female GPA was 1.86 and increased to 1.94 in the eighth grade. There was an increase of .8 of a point. This increase was thought to be a result of the implementation of Multiple Intelligences.
From eighth grade males to eighth grade females there was a difference in GPA’s of .7 of a point. Although the increase was minimal, it was enough to track the rate of increase over the participant’s 9th and 10th grade school years to see if progression continues after junior high school.

The collection of data began at the participant’s conclusion of the 7th grade, prior to entering 8th grade, so a comparison could be accurately made. The grade 8 GPA mean was 86.002. The grade 9 GPA mean was 85.51. A comparison of these two grades shows a decrease of 1.5. This decrease could be accounted for due to the changes in age, or course choices.

Since only 27 participants’ family composite remained the same as it did when it began in the 2007 study, this could be among the reasons for this academic decrease. The data of the participants’ residency concluded that 59 of the participants resided with 2 parents. The participants’ inclusions in establishing the residency of a two-parent household were limited to both biological parents of the participants. The single-parent households to which the participants resided were totaled at 43; which accounted for living with only one biological parent. Of those single and two parent households, the most common socioeconomic status found was that of free lunch participants (34 percent). Only 45.6 percent of the participants paid full price for lunch, which indicate the majority of participant’s parents were that of low socioeconomic status. The school district within which the study was conducted shows that at the Junior High School level, 62 percent of the student population qualifies for free lunch, however, at the High School Level, the number drops to 52 percent. This may be due to high school students involvement in job opportunities and are only in attendance for half of the school day and
in the workplace the other half. This information may be useful in further determining the relationship of the economic status and correlating with academic status.

Once determination was made of student’s socioeconomic status and with whom they resided to see if there may have been a possible connection, the education level of each parent was thought to possibly hold some importance, therefore data was collected and compiled. 36 of the 94 participants surveyed stated their mother had completed high school, and 24 of the 36 women went on to pursue a college education, which led the researcher to believe that this specific percent of females felt education to hold some importance; therefore this information may play a factor in the academic significance found in the study. Only 29 participants’ fathers’ completed High School and of those 29, less than half (13) attended college. When comparing the education levels of the father and the mother, higher results existed of the mother, which indicate that student’s who reside with their mother’s may have a more significant impact on the education of the participants included in this study. Showing residency and education level of parental figures may be a factor in academic achievement, as well.

The highest grade point average was shown in grade 10 with a mean of 86.234. Student involvement in activities such as Athletics, Band, Choir and Drama was found to be in a decrease over the entirety of this longitudinal study. A new course option of drama was offered in 9th grade, as it was not in the 8th grade, therefore providing students a different opportunity to participate. The decrease in Athletics over the two year time period totaled 10 percent which indicated that sports was no longer held in the same regards as in 8th grade. The decrease in Music was somewhat smaller, at a rate of 6 percent. This indicates that as students’ age went up, their interests flourished in participating in both (increase of 11 percent), or decided to pursue neither option
(differing 5 percent).

After examining GPAs and interests other than academics, student absences were reviewed. Absences were found to be comparable in both the 9th and 10th grade with a total of 97 in the 9th grade and a total of 95 in the 10th grade. The most commonly missed number of days by both 9th and 10th graders were between 0-4. Low absences may possibly have some relevance in increases and decreases in academic achievement. With better student attendance it is the researchers belief that there is a possibly academic achievement could be more productive.

Course choices are generally based upon the need for Carnegie units required for graduation, which would exemplify importance of future aspirations of graduation or possibly college attendance by participants. 31.1 percent of students included in the study participated in the Accelerated (AP) courses. Out of the 94 participants, 32 were considered “AP course” students. The second largest was Art with 25 students. Music and Special Education were found both to be at number 7. Theatre had the lowest number of participants with only 6, which was indicative of the students’ interests other than core academics.

The number of participants who played sports was not as large as those who were enrolled in the credited course of Physical Education during the 10th grade school year. At 26.2 percent, this alludes that sports does play a factor in over 25 percent of the participants lives, and may have some direct impact or influence on the academic significance, due to the NCAA policy which states if students do not achieve a certain level academically, they will therefore be unable to participate in athletics. This information indicates there may be a possible connection between sports and academics, and may explain why a larger number of students do not enroll in the Physical Education
The participants exhibited through a survey that 96 percent strongly agreed they learned about the Multiple Intelligences in the 8th grade. Of that 96 percent, 83 percent agreed they used Multiple Intelligences in the 8th grade and 85 percent agreed that Multiple Intelligences were utilized since the introduction in the 8th grade. The researcher attributed the increase in 8th grade academic performance and concluding results of participants in the 10th grade to the inclusion of Multiple Intelligences within the classroom by way of the individual students.

Students were capable of utilizing the Multiple Intelligences within any classroom to be academically successful. This information leads the researcher to believe that the inclusion of Multiple Intelligences during the participants 8th grade school year may have had some impact in the significant increase of the final 10th grade averages. No participants strongly disagreed in the survey regarding the introduction of, neither the implementation of, nor the utilization of Multiple Intelligences since the introduction of Multiple Intelligences in 2007. 5 percent disagreed about the use of MI in the 8th grade; and 6 percent disagreed about usage of the Multiple Intelligences since 8th grade. By incorporating the Multiple Intelligences in the 8th grade U.S. History classroom, students were able to take the skills and strategies learned and utilize them in other areas throughout their high school years as well. This is shown in the comparison over the span of this longitudinal study.

Conclusions

The general purpose of this study was to determine what, if any, effect Multiple Intelligences had on academic achievement. The researcher gathered data and examined if the specific participants’ tenth grade GPAs decreased or increased each year over 2
school years since implementation of the Multiple Intelligences strategy in eighth grade and what factors may have influenced the decrease/increase. An adjusted mean increase of .233 was found to be present between 8th and 10th grade, which indicates significance. According to theorist Howard Gardner (1983), each person has facets of his or her brain that are stronger than others; therefore, all people have the capability to learn and be successful at varying rates. If educators today base student learning primarily on intelligence quotients (IQs), numerical grades, and state test scores, many students will fall between the cracks simply because they do not meet the criteria of the “norm.” Students’ strengths and differences should be recognized and not viewed as a hindrance. All null hypotheses were rejected in this study.

Ho1: There will be no statistically significant difference among specific students at the end of their 8th and 10th grade school years with regard to grade point averages (GPAs).

A statistically significant difference was found after data were gathered. There was a difference of .233 between the 8th grade and 10th grade adjusted mean.

Ho2: There will be no statistically significant difference among specific students’ involvement in music, athletics, choir, and drama at the end of their eighth and tenth grade school years, respectively.

There were statistically significant differences in athletics, music, choir and drama, indicating that as students’ age went up, their interests flourished in participating in both (increase of 11 percent), or decided to pursue neither option (differing 5 percent). Interests did change from the 2007 study to the 2009 study. Some students added activities and some students dropped activities. The number of interests in no area remained the same.
The main focus guiding the study questioned what academic measurable outcome was evident when eighth grade students are aware of and utilize their multiple intelligences within a U.S. History classroom and does teaching those strategies have any impact on these students in their educational future. The quantitative research within this study indicated that students’ grade averages progressively increased and is thought to be a result of the integration of Multiple Intelligence strategies within the academic classroom. An increase was shown and several factors seemed to facilitate positive changes when Multiple Intelligences was implemented in the classroom by the participants. Qualitative evidence through teacher interviews captured students utilizing methods of study that focused on their strengths. Once participants recognized their potential in the classroom in the 8th grade and made the accommodations throughout their 9th and 10th grade school years to learn in their best learning style, academic achievement increased significantly. This information indicated that initial participants who are receptive to utilizing the Multiple Intelligences within their educational setting may become more academically successful than those who chose not to do so.

Conclusions made by the researcher are that by utilizing Multiple Intelligences in the classroom, students may become more productive learners, not only for the school year, but in life as well. Data compiled in this study could possibly provide a solid learning base for future educational decisions with regards to the curriculum and how educators teach. The significant increase in GPAs could influence future research and Multiple Intelligences, as utilized in this study, may provide possibilities for increased academic achievement. Opportunities for districts, legislators, representatives and presidents to become more active in education reform and provide endless possibilities for students to be successful are now a closer goal to achieve because of this study.
It is the researcher’s belief that by teaching to the individual students instead of teaching to a test or specific method of assessment as we are driven to do in education today due to the constraints placed upon educators, students may become more productive learners, and essentially more effective adults. With all the funding and resources available today, and reviewing the numerous reforms over the course of history, Multiple Intelligences theory incorporation within the classroom may be the answer to the issues facing public education today—raising test scores, and decreasing drop-out rates.

Recommendations for Policy and Practice

Because there was a significant increase in the students involved in the inclusion of the Multiple Intelligence study, the researcher plans to facilitate staff development for colleagues in hopes that more educators will realize the effectiveness of these strategies and techniques when they are implemented in their classrooms. In the upcoming school year at the researcher’s school as well as within the district, the researcher will provide mentorship to fellow educators and implement Multiple Intelligences in other U.S. History teachers’ classes. The researcher will begin an internet blog of a reflective journal to note what techniques were successful in lesson implementation and which were not for not only the educators within the school district, but for all educators to peruse. Introduction and implementation of Multiple Intelligences incorporation into an 8th grade History classroom may spark other educators to become more cognizant of these successful strategies and possibly begin implementation of them into their own classrooms.
Future Recommendations

In the initial 2007 study, a recommendation from the researcher was that this study be repeated over several years; thus, this study was conducted over a longitudinal time frame, as this long term data could possibly increase the validity and reliability for future researchers in the field of Multiple Intelligences. With this study including data readily available, the researcher plans to inform the district superintendent and the state department of education superintendent of these findings in hope of implementing Multiple Intelligences within the district first, then at a state level, and possibly nationwide. It is this researcher’s desire that the knowledge of Multiple Intelligences will be infectious and motivate others to seek beyond the familiar.
APPENDIX A
MULTIPLE INTELLIGENCE SUPPLEMENTARY ACTIVITIES

Assignment for theme of Location –
Incorporates: Visual/Spatial; Logical/Mathematical; Linguistic
ACTIVITIES:
*** use graph to plot points for absolute location
*** use verbal directions for relative location
(Tell a classmate how to get to your house)

Assignment for theme of Place –
Incorporates: Visual/Spatial; Linguistic; Naturalistic
ACTIVITIES:
*** use pictures to show difference between cultural features and physical features
(Find relevant pictures in a magazine which show 5 physical features, and 5 cultural
features of a place)
(Read in passages provided in this center; highlight the physical features with a yellow
highlighter and the cultural features with a pink highlighter)

Assignment for theme of Human/Environment Interaction
Incorporates: Interpersonal
ACTIVITIES:
*** explain communication
*** explain how where you live effects how you live
(Draw a picture of an effect they have seen or witnessed)
(Write a letter to a company that violates the environment in some way. Research the
company and have accurate facts first. Use proper letter writing skills.)

Assignment for theme of Movement
Incorporates: Intrapersonal
ACTIVITIES:
*** show the classes how theme of movement affects culture
(Write a journal entry as if they were to leave today, their homes, family, and friends, and
go to a foreign place, with no money, no job, no place to stay, and knew no one.)

Assignment for theme of Region
Incorporates: Naturalist, Musical
ACTIVITIES:
*** give some examples of our region
(Make a list of each letter of the alphabet and put in some features about or items we have
in Biloxi (or your hometown)
A= nts
B= roken houses
C= oncrete… lots Of concrete
*** take at least 3 words made with alphabet and put to a tune (familiar such as Mary had
a Little Lamb, etc.)
APPENDIX B

IRB APPROVAL FORM

HUMAN SUBJECTS PROTECTION REVIEW COMMITTEE
NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Human Subjects Protection Review Committee in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 27061101
PROJECT TITLE: Multiple Intelligences: Developing an Understanding of the Relevance of History Through Theory
PROPOSED PROJECT DATES: 08/03/07 to 05/23/08
PROJECT TYPE: Dissertation or Thesis
PRINCIPAL INVESTIGATORS: Christa Fountain Glenn
COLLEGE/DIVISION: College of Education & Psychology
DEPARTMENT: Curriculum, Instruction, & Special Education
FUNDING AGENCY: N/A
HSPRC COMMITTEE ACTION: Exempt Approval
PERIOD OF APPROVAL: 06/11/07 to 05/10/08

Lawrence A. Hosman, Ph.D.
HSPRC Chair

6-12-07
Date
APPENDIX C

IRB APPROVAL FORM (EXTENSION)

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

Institutional Review Board

118 College Drive #5147
Hattiesburg, MS 39406-0001
Tel: 601.266.6820
Fax: 601.266.5509
www.usm.edu/irb

HUMAN SUBJECTS PROTECTION REVIEW COMMITTEE
NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Human Subjects Protection Review Committee in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the “Adverse Event Report Form.”
- If approved, the maximum period of approval is limited to twelve months.

Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: C27061101
PROJECT TITLE: Multiple Intelligences: A Comparison of Standardized Test Scores from Multiple Intelligence Based Schools and Public Schools
PROPOSED PROJECT DATES: 08/03/07 to 05/23/08
PROJECT TYPE: Dissertation or Thesis
PRINCIPAL INVESTIGATORS: Christa Fountain Glenn
COLLEGE/DIVISION: College of Education & Psychology
DEPARTMENT: Educational Leadership & Research
FUNDING AGENCY: N/A
HSPRC COMMITTEE ACTION: Exempt Approval of a Change in a Previously Approved Project
PERIOD OF APPROVAL: 03/25/08 to 03/24/09

Lawrence A. Hosman, Ph.D.
HSPRC Chair

Date
November 27, 2007

Murray Killebrew, Principal
Biloxi Junior High School
1424 Father Ryan Avenue
Biloxi, MS 39530

Dear Mrs. Glenn

I am aware you are currently a graduate student enrolled in the Doctoral program at the University of Southern Mississippi (USM) on the Coast. You have my permission to conduct your study at Biloxi Junior High School. I understand you will study the incorporation of Multiple Intelligences implemented in the history classroom and the effect it can have on students grades and MCT standardized test scores.

You may be requested to share the results of the survey with your colleagues.
I am very pleased to assist you with this matter.
I appreciate your time and interest in the continued professional learning.

Sincerely,

Murray Killebrew
APPENDIX E

PERMISSION FROM DISTRICT SUPERINTENDENT

From: Christa Glenn  
Sent: Wednesday, May 06, 2009 10:40 AM  
To: Paul Tisdale  
Subject: RE: help

Hey Dr. Tisdale,

I am working on my Dissertation and need information from my original participants that I conducted my thesis with in 2007. I want to track their progress after 8th grade. These students are now in 10th grade at the high school.

I am in need of an administrator’s permission.

Thanks Dr. T.

From: Paul Tisdale  
Sent: Sunday, May 10, 2009 10:16 AM  
To: Christa Glenn

Christa

Will do, Christa.

I have approved your request.

tisdale

What you believe about yourself will determine your life.
APPENDIX F

PARENTAL CONSENT FORM

Student Release Form

(To be completed either by the parents/legal guardians of minor students involved in this project)

Dear Parent or Guardian:

I am a participant this school year in a doctoral program to obtain a degree in educational administration. My participation in this study, which is in partial fulfillment from the University of Southern Mississippi, is voluntary. The primary focus of this study is to enhance student learning and encourage students to develop an appreciation of history through the use of a variety of learning styles.

This study will require your child’s grades on certain class materials such as tests, quizzes, surveys, and questionnaires to be submitted. Through the course of this study, I may be asked to submit samples of student work as evidence of teaching methods and practices, and that may include some of your child’s work.

No child’s name will appear on any materials that are submitted or used in the thesis paper. All materials will be immediately discarded by shredding documents and work samples following the conduction of the research.

The form below will be used to document your permission or exclusion from this research. Your child will be required to complete the assignments which will be provided to all students, however, if you choose for your child to be excluded in this study, his/her academic grades for history will not be used.

You may email me at christa.glenn@biloxischools.net or phone at (228) 435-1421. My planning period begins daily at 2:05 and I welcome any questions or concerns you might have.

Sincerely,

Christa F. Glenn (History teacher)
PLEASE RETURN THIS PORTION:

I am the parent/legal guardian of the child named below. I have received and read your letter regarding a study being conducted in conjunction with the University of Southern Mississippi and agree to the following:

☐ I DO give my permission to you to include my child’s grades/work samples in history class conducted at Biloxi Junior High School by Christa Glenn. No names will appear on any materials submitted by the teacher.

☐ I DO NOT give my permission to you to include my child’s grades/work samples in history class.

Student Name (please print): _______________________________________

Parent Name (please print): _________________________________________

Parent Signature: _________________________________________________
## APPENDIX G

### STUDENT SURVEY

**Multiple Intelligences**

Please fill out the items in the survey below.

1. **What is your ethnicity?**
   - [ ] African American
   - [ ] Asian
   - [ ] Caucasian
   - [ ] Hispanic
   - [ ] Not mentioned

2. **What is your gender?**
   - [ ] Male
   - [ ] Female

3. **Are you a tuition student in Biloxi Public School District?**
   - [ ] Yes
   - [ ] No

4. **Approximately how many days were you absent during your 9th grade year?**
   - [ ] 0-5
   - [ ] 6-10
   - [ ] 11-15
   - [ ] 16-20
   - [ ] more than 21

5. **Approximately how many days were you absent during your 10th grade year?**
   - [ ] 0-5
   - [ ] 6-10
   - [ ] 11-15
   - [ ] 16-20
   - [ ] more than 21
6. With whom do you live?
- Both Mother and Father
- Mother
- Father
- Guardian

7. Is the parent/guardian you currently live with in any branch of the military?
- Yes
- No

8. What is the highest level of education completed by your mother?
- Junior High School
- High School Degree
- G.E.D.
- College Degree
- Don't Know

9. What is the highest level of education completed by your father?
- Junior High School
- High School Degree
- G.E.D.
- College Degree
- Don't Know

10. Has your family make-up changed since you were in 8th grade? (Divorce, death, marriage, birth)
- Yes
- No

11. If your family make-up has changed since 8th grade, how has it changed specifically? (Check all that apply)
- Divorce
- Death of a parent/step-parent
- Re-Marriage of a parent
- Birth
- Has not changed
12. **When in 8th grade, I participated in**  (check all that apply)
- [ ] sports
- [ ] band
- [ ] drama
- [ ] choir
- [ ] none of the above

13. **When in 9th grade, I participated in**  (check all that apply)
- [ ] sports
- [ ] band
- [ ] drama
- [ ] choir
- [ ] none of the above

14. **I currently participate in**
- [ ] Sports
- [ ] Band
- [ ] Drama
- [ ] Choir
- [ ] None of the above

15. **I applied Multiple Intelligences to my class (classes) when I was in 8th grade.**
- [ ] Strongly Agree
- [ ] Agree
- [ ] I don't know
- [ ] Disagree
- [ ] Strongly Disagree

16. **I applied Multiple Intelligences to at least one of my classes over the past 2 yrs.**
- [ ] Strongly Agree
- [ ] Agree
- [ ] I don't know
- [ ] Disagree
- [ ] Strongly Disagree
17. I remember learning about Multiple Intelligences in 8th grade.
☐ Strongly Agree
☐ Agree
☐ I don't know
☐ Disagree
☐ Strongly Disagree

18. I have applied the use of Multiple Intelligences in class (classes) since learning about them in 8th grade.
☐ Strongly Agree
☐ Agree
☐ I don't know
☐ Disagree
☐ Strongly Disagree

19. I have seen an increase (grades) in the following subject areas (Check all that apply)
☐ Science
☐ Math
☐ English
☐ Social Studies

20. My attitude toward going to college has changed over the past two years.
☐ Strongly Agree
☐ Agree
☐ I don't know
☐ Disagree
☐ Strongly Disagree
# APPENDIX H

## MULTIPLE INTELLIGENCE QUIZ

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1.</td>
<td>I use my hands a lot when talking</td>
<td>Yes</td>
</tr>
<tr>
<td>2.</td>
<td>I do at least one sport in my own free time on a regular basis</td>
<td>Yes</td>
</tr>
<tr>
<td>3.</td>
<td>I find it difficult to sit still for long periods of time</td>
<td>Yes</td>
</tr>
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<td>4.</td>
<td>I like working with my hands at concrete activities</td>
<td>Yes</td>
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<tr>
<td>5.</td>
<td>My best ideas come when I'm out walking or active in some way</td>
<td>Yes</td>
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<tr>
<td>6.</td>
<td>I often like to spend my free time outdoors</td>
<td>Yes</td>
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<td>7.</td>
<td>I need to touch things in order to learn about them</td>
<td>Yes</td>
</tr>
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<td>8.</td>
<td>I enjoy daredevil amusement rides or other thrilling physical activities</td>
<td>Yes</td>
</tr>
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<td>9.</td>
<td>I am pretty well coordinated i.e. not clumsy or awkward in my movements</td>
<td>Yes</td>
</tr>
<tr>
<td>10.</td>
<td>I prefer to learn a new skill by doing it, rather than reading how to do it</td>
<td>Yes</td>
</tr>
<tr>
<td>11.</td>
<td>Books are very important to me</td>
<td>Yes</td>
</tr>
<tr>
<td>12.</td>
<td>I can hear words in my head before I read or speak or write them down</td>
<td>Yes</td>
</tr>
<tr>
<td>13.</td>
<td>I get more out of listening to the radio or tapes than I do out of TV or films</td>
<td>Yes</td>
</tr>
<tr>
<td>14.</td>
<td>I am good at word games like Scrabble, Anagrams or Password</td>
<td>Yes</td>
</tr>
<tr>
<td>15.</td>
<td>I enjoy entertaining myself or others with tongue twisters or puns</td>
<td>Yes</td>
</tr>
<tr>
<td>16.</td>
<td>Others at times ask me to explain the words I use when writing and speaking</td>
<td>Yes</td>
</tr>
<tr>
<td>17.</td>
<td>English and History are easier for me than Math and Science</td>
<td>Yes</td>
</tr>
<tr>
<td>18.</td>
<td>When out driving I notice the words on the ad boards more than the scenery</td>
<td>Yes</td>
</tr>
<tr>
<td>19.</td>
<td>I often talk about the things I have read or heard</td>
<td>Yes</td>
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<tr>
<td>20.</td>
<td>I've written something recently that I was proud of, or others praised me for</td>
<td>Yes</td>
</tr>
<tr>
<td>21.</td>
<td>People often come to me for advice</td>
<td>Yes</td>
</tr>
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<td>22.</td>
<td>I prefer group sports to solo sports</td>
<td>Yes</td>
</tr>
<tr>
<td>23.</td>
<td>If I have a problem I'll ask for help, and not try to solve it by myself</td>
<td>Yes</td>
</tr>
<tr>
<td>24.</td>
<td>I have at least three close friends</td>
<td>Yes</td>
</tr>
<tr>
<td>25.</td>
<td>I like social games/activities rather than individual ones that I do alone</td>
<td>Yes</td>
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<tr>
<td>26. I enjoy the challenge of teaching others what I know how to do</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>27. I consider myself a leader, or others have called me that</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>28. I feel comfortable in the middle of a crowd</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>29. I like to get involved in social activities connected with my work/church/community</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>30. I prefer to go out with a group at night to being on my own at home</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>31. I like to spend time alone, thinking about life</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>32. I like sessions/classes that help me learn more about myself</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>33. I have opinions that set me apart from the crowd</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>34. I have a special hobby/interest that I keep to myself</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>35. I have important goals for my life that I think about often</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>36. I have a good idea of my strong points and my weak points</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>37. I’d prefer to spend a weekend alone, rather than with crowds of people</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>38. I consider myself strong-willed and independent</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>39. I keep a diary to record the events of my life</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>40. I would like to be self-employed</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>41. I have a pleasant singing voice</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>42. I can tell when someone sings off key or out of tune</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>43. I spend a lot of time listening to music</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>44. I play a musical instrument</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>45. My life would be poorer if there were no music in it</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>46. I often find a TV jingle or a tune running through my mind as I walk or work</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>47. I can keep time to a piece of music with a drum or sticks</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>48. I know the tunes to many different songs or musical pieces</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>49. If I hear a piece of music once or twice I can sing it back</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>50. I often tap a tune or sing a tune while studying or working</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>51. I often see a picture/image when I close my eyes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>52. I am sensitive to color</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>53. I like using a camera or camcorder</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>54.</td>
<td>I enjoy doing a jigsaw puzzles, findings my way through mazes or visual puzzles</td>
<td>Yes</td>
</tr>
<tr>
<td>55.</td>
<td>I have vivid dreams at night</td>
<td>Yes</td>
</tr>
<tr>
<td>56.</td>
<td>I can usually find my way around places that I don’t know well</td>
<td>Yes</td>
</tr>
<tr>
<td>57.</td>
<td>I like to draw or doodle</td>
<td>Yes</td>
</tr>
<tr>
<td>58.</td>
<td>Geometry is easier for me than Algebra</td>
<td>Yes</td>
</tr>
<tr>
<td>59.</td>
<td>I can imagine how something would look if I were right above it</td>
<td>Yes</td>
</tr>
<tr>
<td>60.</td>
<td>I prefer books that have lots of pictures in them</td>
<td>Yes</td>
</tr>
<tr>
<td>61.</td>
<td>I can easily add and subtract numbers in my head</td>
<td>Yes</td>
</tr>
<tr>
<td>62.</td>
<td>Math and Science are my favorite subjects in school</td>
<td>Yes</td>
</tr>
<tr>
<td>63.</td>
<td>I enjoy playing games/solving puzzles that need logical thinking</td>
<td>Yes</td>
</tr>
<tr>
<td>64.</td>
<td>I like to set up little what-if &amp; what not; experiments, (e.g. What if I double the amount of water I give to my rose bush each week)</td>
<td>Yes</td>
</tr>
<tr>
<td>65.</td>
<td>I'm always looking for patterns and logical sequence</td>
<td>Yes</td>
</tr>
<tr>
<td>66.</td>
<td>I'm interested in all new developments in Science</td>
<td>Yes</td>
</tr>
<tr>
<td>67.</td>
<td>I believe almost everything has a rational explanation</td>
<td>Yes</td>
</tr>
<tr>
<td>68.</td>
<td>I sometimes think in clear, wordless, picture-less thoughts</td>
<td>Yes</td>
</tr>
<tr>
<td>69.</td>
<td>I always notice when people aren't being logical in what they say</td>
<td>Yes</td>
</tr>
<tr>
<td>70.</td>
<td>I like it when things are measured, analyzed and put into categories</td>
<td>Yes</td>
</tr>
<tr>
<td>71.</td>
<td>When I move to a new place, I notice the animal and plant life in it</td>
<td>Yes</td>
</tr>
<tr>
<td>72.</td>
<td>I keep a pet or I would like to have a pet</td>
<td>Yes</td>
</tr>
<tr>
<td>73.</td>
<td>I can recognize and name many kinds of trees, flowers, plants</td>
<td>Yes</td>
</tr>
<tr>
<td>74.</td>
<td>On a walk my attention is on wildlife, nests and tracks rather than on people</td>
<td>Yes</td>
</tr>
<tr>
<td>75.</td>
<td>I can read weather signs</td>
<td>Yes</td>
</tr>
<tr>
<td>76.</td>
<td>I like gardening</td>
<td>Yes</td>
</tr>
<tr>
<td>77.</td>
<td>I am interested in global environmental issues</td>
<td>Yes</td>
</tr>
<tr>
<td>78.</td>
<td>I am aware of/sensitive to my local environment</td>
<td>Yes</td>
</tr>
<tr>
<td>79.</td>
<td>I visit botanical gardens, zoos or aquariums when on holidays</td>
<td>Yes</td>
</tr>
<tr>
<td>80.</td>
<td>I can name many kinds of animals, insects etc.</td>
<td>Yes</td>
</tr>
</tbody>
</table>
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