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**Investigating Commonalities Among
Elementary Schools That Have Implemented
The Theory of Multiple Intelligences: A Guideline for the 21st Century**

Andrea Goodman Weiner

Presented to the Graduate and Research Committee
of Lehigh University
in Candidacy for the Degree of

**DOCTOR OF EDUCATION
IN
FOUNDATIONS of EDUCATION**

Lehigh University
April, 2001

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Dedication

This dissertation is dedicated to two individuals in my life representing both the past and the future.

In honor of my father, Earl W. Goodman (1920-1976), I dedicate this in memory of the many beliefs that he lived by and stood for. He was a man who was an “active dreamer” and taught me the principles of integrity, truthfulness, tenacity, and living life to its fullest. In honor of my daughter, Allysa Joy Weiner, this study is dedicated to her foray into the future educational system that will hopefully teach children to honor their strengths, to seek the answers to questions not yet asked, and to manifest within themselves the quest for lifelong learning.

Acknowledgements

I wish to express my deepest appreciation to the many individuals who helped me make this endeavor a reality. As I look back over the last few years, I wonder how I would have ever completed it without their support, encouragement, and patience.

My sincere gratitude is extended to the members of my doctoral dissertation committee for their continual support and professional guidance. They are Dr. Alden J. Moe, Chair, Dr. Ronald Yoshida, Dr. Bruce Fischman, and Dr. Roy Herrenkol. A special thanks to Dr. Alden J. Moe, who believed in my topic from the very beginning and whose caring attitude, knowledge, and genuine interest in the student exemplifies the embodiment of a true teacher.

Another round of thanks to Wendy Meagher whose insights as a teacher and her help in typing were greatly appreciated. My gratitude also goes to Margaret Bledsoe for her editing ability and her daily encouragement.

Finally, a special thank you goes to my family and many friends who kept rallying me on to complete this work. And last but not least, to my husband, Jeffery, whose love and support sustained me throughout all of this doctoral process. His understanding, generosity, and partnership enabled me to complete this educational goal.

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ABSTRACT

The purpose of the study was to examine the commonalities among twenty elementary schools in the United States that have implemented the theory of multiple intelligences for three years or more. Due to the absence of pedagogical guidelines and educational approaches to this theory, this study was intended to provide effective strategies for future application in curriculum implementation and teacher collaboration, instructional methodology, and academic assessment.

The research design employed in this qualitative study was the survey method. The data collection instruments used were two cross-sectional surveys. Twenty school principals participated in the study through completing a phone interview questionnaire survey. To further elaborate upon the information provided by the principals, teacher questionnaires were sent to two or more third or fourth grade teachers per school. A content analysis was performed on the principal interviews and teacher questionnaires to assess the data results. This data was triangulated through an ethnographic study of three elementary schools selected out of the twenty participating schools.

Through understanding how teachers, principals, parents, and students responded in an environment into which the theory of multiple intelligences was incorporated, a set of commonalities was identified. These commonalities led to the development of a set of guidelines that contains effective strategies for implementing the theory of multiple intelligences in an educational setting. Among the most prevalent guidelines found were

the following: monthly inservice days for teacher collaboration on MI curricular ideas, incorporation of an integrated arts program that enhances an MI curriculum, usage of self-selected student projects, computer assisted instruction, and MI learning centers as instructional methods, encouragement of students to recognize and identify their different intelligences, incorporation of the eight intelligences with understanding and depth, and the use of authentic-based assessments as much as possible.

The investigator recommends for future research a study to examine the achievement factors in MI schools and compare the results to non-MI schools. The researcher recommends for future practice the use of multiple intelligences in the classroom which supports teachers in identifying students' strength intelligences and the opportunity to view each student from a strength perspective.

CHAPTER ONE

Introduction

What lies behind us and what lies before us are

tiny matters compared to what lies within us. -- OLIVER WENDELL HOLMES

Underlying the notion of changing how and what we teach to our students is a strong belief that teaching for intelligence is a primary goal of education (Costa, 1981). The relationship between intelligence and education has been, and continues to be, an important topic to study among educators, psychologists, and others. The relationship and its magnitude are significant to educators because the intelligence of students constrains and informs educational practice (Wagner and Steinberg, 1984).

The Study of Intelligence

During the twentieth century, the study of human intelligence as a way to predict academic performance has been of great interest to many psychologists. Binet and Simon (1916) made the first attempts to define intelligence technically and to devise tests that could quantify it through the construct of an intelligence quotient (IQ). Spearman (1904, 1927) proposed that there was an inherited, unitary, general factor of intelligence called “g.” He believed that all mental ability drew upon this general intelligence factor “g” in varying degrees. Although Binet and Spearman proposed intelligence as a single entity, other psychologists and researchers from the 1930s on challenged this viewpoint and created a trend toward a more expansive perspective. Thurstone (1938) went beyond the notion of unitary intelligence and developed his theory based on seven primary

mental abilities. Along with introducing these primary mental abilities to the intelligence testing community, he also devised a multivariate analysis as a method of measuring intellectual functioning (Morgan, 1996). Guilford (1967) used the factor analytic tradition which led to the theory that there were five kinds of operations of the intellect that produced 120 separate kinds of abilities. The triarchic theory of intelligence, proposed by Sternberg (1985), focused on three aspects of intelligence: analytic, creative, and practical.

The Theory of Multiple Intelligences

The traditional belief that intelligence and human cognition is unitary and can be assigned a single, quantifiable number (i.e., IQ score) had been further challenged in the early 1980s by Gardner's theory of multiple intelligences (Campbell, Campbell, and Dickinson, 1992). Gardner (1983) defined intelligence as the ability to solve problems that are valued in one or more cultural settings. The problem solving skill involved enables one to approach a situation with an end means to reach a goal (Walters and Gardner, 1985). Gardner has argued that the ability to solve problems by applying knowledge, facts, and concepts into new situations to increase understanding is the real purpose of education (Harris, 1995).

The theory of multiple intelligences is framed in the biological origin of problem solving skills universal to humans, regardless of the cultural environment. Gardner has suggested that any theory of intelligence must be biologically based in the physiology of brain structure (Armstrong, 1993). He found brain research to yield powerful evidence that the central nervous system, which has evolved over the millennia, portrayed discrete

kinds of intelligence.

Unlike the classical notion of a unitary form of intelligence (g), Gardner has proposed there are several different, relatively autonomous intelligences. These intelligences exist in all normal individuals in differing degrees, but all work in combination with one another (Kornhaber and Krechevsky, 1993). These eight intelligences – linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, intrapersonal, interpersonal, and naturalist – have added to a broader conception and reformation of intelligence that is fundamental to Gardner's theory. However, in the United States, the intelligences that are assessed the most by standardized tests and recognized for success are linguistic and logical-mathematical intelligences (Smagorinsky, 1991). These intelligences, interwoven within our educational framework, were based on the notion that schooling consists of the three R's of writing, reading, and arithmetic: in other words, language and mathematical skills. Gardner (1983) contends that the other six intelligences should be viewed equally and that each individual manifests all eight types of intelligence in varying degrees of skill.

Need for the Study

When Gardner (1983) introduced his theory of multiple intelligences in his book *Frames of the Mind* (1983), his theory was aimed at his fellow psychologists. However, the book's impact was felt largely among educators in elementary and secondary education. Many in the field of education embraced Gardner's theory as a means to develop a framework for maximizing their students' inherent potential. Within a few years after the publication of *Frames of the Mind*, there were many private and public

schools basing their curriculum upon the theory of multiple intelligences. However, only a few of these schools had any association with Gardner or his research group, Harvard Project Zero (Kornhaber & Krechevsky, 1993). Project Zero, based out of The Harvard University Graduate School of Education, is a research think tank that investigated programs for instruction and assessment. Gardner's theory of multiple intelligences has been a major topic of research for this group.

Kornhaber and Krechevsky (1993) claimed that the adoption of the theory of multiple intelligences by educational institutions was unlike the adoption of several other educational reforms. Unlike founders of other reform efforts, Gardner did not propose a particular model for implementing his theory. Thus, the theory of multiple intelligences stands in contrast to such reforms as James Comer's School Development Program at Yale University. Fiske (1992) reported that James Comer, who pioneered parental involvement in inner-city schools, promoted organizational change via a model which involved a governing council of teachers and principals, a parental team, and a mental health team of counselors and school psychologists. While organizational changes promoted the overall school environment, the School Development Program also trained district and school staff to apply the theoretical frameworks of the program.

Beyond this lack of a model of implementation for his theory, Gardner also did not advocate any particular pedagogical methodology. For instance, Gardner does not provide any direction on how the different intelligences should be taught in the curriculum nor how these intelligences can be individually addressed in each student. Other educational reformers have opted for a different approach whereby implementing

more specific guidelines for practical application of their educational concepts. Fiske (1992) further reported that unlike the theory of multiple intelligences, Ted Sizer's Coalition of Essential Schools does advocate a rubric for pedagogy for high school level organization and curriculum. Sizer's original purpose was to have schools redesign their educational programs using nine principles which included student-as-worker and teacher-as-coach that promoted new modalities for classrooms.

Unlike Comer's and Sizer's reforms which included field staffs who visit involved schools to offer consultation, gather data, and provide feedback, Gardner's team originally did not. They have recently begun holding summer institutes at Harvard Project Zero for schools that are interested in implementing his theory. In the past, the Project Zero staff members have been more interested in research than in creating a framework for schools using the theory of multiple intelligences. Given the absence of pedagogical guidelines, approaches for implementation, and lack of field staff, there is a need to examine a multitude of schools that are using the theory of multiple intelligences in order to ascertain how they have adopted the theory and what resulting outcomes they have observed.

Statement of the Problem

The purpose of this study was to determine the commonalities among those elementary schools in the United States that have implemented Howard Gardner's theory of multiple intelligences for three or more years. Among those schools that were investigated, effective applications of the theory of multiple intelligences were examined in an effort to understand how teachers, students, parents, and principals have responded

to an environment where multiple intelligences were integrated. The end product of this study is guidelines of effective application strategies of the theory of multiple intelligences for schools to use for future practice.

Research Question

Specifically, this dissertation was guided by one primary research question: What were the major identifiable commonalities of effective applications of the theory of multiple intelligences among those elementary schools investigated? Applications of this theory involved examining curriculum implementation and teacher collaboration, instructional methodology, and academic assessment.

Limitations of the Scope of the Problem

The majority of this study's population was limited to those schools obtained through Harvard's Project Zero that have implemented the theory of multiple intelligences for three years or more. There were also a few schools that were not on Project Zero's list that had come to the attention of the researcher of this study. However, there may be schools that have escaped the attention of Project Zero and the researcher and they would not have been included in this study.

The study was limited to elementary schools, even though there are several secondary schools that have implemented the theory of multiple intelligences. Thus, the results from this study were not generalized beyond what is appropriate for elementary schools.

The data collected from the principals and teachers interviewed for the study was based on the respondents' answers to the questions on the survey. However, the

answers to these questions were limited to the truthfulness of the respondents in the study.

Definition of Terms

1. Guideline - Term used to describe a set of recommendations intended for practical guidance. For this particular study, the guideline pertained to strategies for effective implementation for the theory of multiple intelligences.

2. Theory of multiple intelligences - Howard Gardner's biologically-based theory of intelligence that proposed that there were eight different intelligences that are within all individuals with differing degrees, yet all work in combination with one another (Krechevsky & Kornhaber, 1993).

3. Academic assessment - Term representing how students are assessed regarding their scope of knowledge and skills in subject areas. For this particular study, this will include standardized test scores, grades, and performance-based assessment approaches. Performance-based assessment is defined as a variety of tasks whereby students demonstrate their understanding of learned material and apply it in various modes of context (Burke, 1993).

CHAPTER TWO

Review of the Literature

The search to understand the phenomenon of human intelligence and how to harness it has been a major pursuit of psychologists and educators for over a century. There is much in the literature concerning intelligence and IQ testing, but the literature regarding research of multiple intelligences is still in its infancy. This section discusses the historical perspectives of intelligence theories and their measurement, the IQ testing controversy, the heredity versus environment debate, intelligence testing, the foundations of the theory of multiple intelligences, implementation of multiple intelligences in the classroom and its impact, and assessment approaches of multiple intelligences.

Historical Perspective of Intelligence Theories and Their Measurement

The interest in the concept of intelligence and its measurement has engendered much contention. Perhaps the definition of intelligence itself has been the major source of the debate. Definitions of intelligence are shaped by the time, place, and culture in which they evolve (Kornhaber, Krechevsky, and Gardner, 1990). All cultures acknowledge the degree in which people exhibit intelligent behavior in the ways that they solve problems. Neisser (1979) studied individuals' own perceptions of intelligence and found that three commonalities existed among their definitions. The first commonality was practical problem solving and ability to reason logically. The second commonality

was being a good conversationalist (verbal ability, and proficiency in reading), and the third commonality was sensitivity to social cues and displaying interest in the world (social intelligence). Sternberg, Conway, Ketron, and Berenstein (1981) also are in strong agreement with these layperson's perceptions of intelligence. The difficulty in agreeing on a definition of intelligence is that there are as many definitions of intelligence as there are individuals asked to define the concept (Weinberg, 1989).

In the late 19th century, Francis Galton was the first psychologically-oriented scientist to try to measure intelligence directly. Galton saw the notion of intelligence as the fundamental ability that is responsible for human superiority of races of humankind. Although Galton had a theoretical interest in the concept of intelligence, he had also hoped to increase the overall intelligence of the population through proper "breeding" (Gardner and Hatch, 1989).

At the turn of the 20th century, the traditional viewpoint of intelligence assumed that our ability to learn arose from a uniform cognitive capacity. In 1916, Alfred Binet and Theodore Simon made the first efforts to technically define intelligence and to devise tests that could quantify it. After Binet and his colleagues were approached by the Minister of Public Education in France to develop a means to identify low performing students, Binet published his first version of his intelligence test (Hilliard, 1990). Binet and Simon saw intelligence as a "fundamental faculty" which encompassed judgment, practical sense, initiative, and adapting to circumstances (Weinberg, 1989). Binet developed an intelligence test that consisted of 30 different items ranging from the ability

to touch one's nose and follow simple instructions to the ability to name familiar objects from pictures and to define abstract concepts. This became the basis for Binet's concept of mental age and a single score that was the individual's level of mental development relative to others. Gould (1981) claimed that Binet insisted upon three principles for his tests. These principles include scores which did not define anything innate or permanent, the scale which was to be a guide to identify special needs children requiring remediations and not to be used for ranking normal children, and low scores which should not be used to label children as innately incapable, but that the emphasis should be on improvement through special training. Not only did Binet disagree with the notion of intelligence as a unitary trait, "but all of his caveats were later disregarded, and his intentions overturned, by the American hereditarians who translated his scale into written form as a routine for testing all children" (Gould, 1981, p. 155).

The same year Binet published his intelligence test, Louis Terman designed the Army Alpha Examination for use in testing army recruits during World War I. This test, which was later called the Stanford-Binet scale, measured intelligence as a unitary trait. Whereas Binet designed his test for the modifiability of intelligence, Terman argued for the opposite, using his test as a predictive instrument (Hilliard, 1990). Within thirty months after the 1916 publication of Terman's group test, four million children had been tested as a basis for pupil classification, guidance, and college admission (Cronbach, 1975). Test technology had become an accepted feature of American life and was best reflected in Terman's comment "teachers must learn to use tests, otherwise the universal grading of children according to mental ability must remain a Utopian dream" (Terman,

1919, p. 291).

The Stanford-Binet was the primary test used for intellectual assessment until its competitor, the Weschler Scales, came out in the 1940s. Weschler saw intelligence “as the aggregate of global capacity of the individual to act purposely, to think rationally, and to deal effectively with his environment” (Weschler, 1944, p. 3). Weschler went beyond Binet’s concept of unitary intelligence to include two categories of verbal and performance objectives for further evaluation of intellectual abilities, ranging from pre-school children to adult. The Weschler Scales not only provided an overall IQ, but also provided information about specific sub-components of intelligence (Santrock, 1990).

Binet’s work spurred other theorists to further evaluate the concept of intelligence and how it could be quantified. While studying the factor structure of intelligence test scores, Spearman concluded that all individuals had a general intelligence factor, little *g*. Spearman (1927) argued that this general factor exists in every large collection of diverse intellectual tasks. Although Spearman felt that intellectual endeavors were dependent on *g*, he also acknowledged that abilities, knowledge, and aptitudes have a unique, specific factor, *s* (Weinberg, 1989). Spearman believed that these two factors could account for an individual’s performance on an intelligence test.

Whereas there was a belief in general intelligence to be the primary justification for using the intelligence quotient as a single index of intelligence, there were other psychologists who believed that intelligence was comprised of separate entities that operated independently. Thurstone (1938) developed what he labeled primary mental

abilities. He recommended that individual testing feature the seven primary factors of verbal ability, word fluency, memory, deductive reasoning, numerical facility, spatial ability, and perceptual speed. Thurstone believed that these abilities were primary and fundamental, but also correlated with one another (Sternberg, 1981).

Not only did Thurstone's work challenge Spearman's view of unitary intelligence, but it also opened the floodgates for others to generate more theories of multifaceted approaches to intelligence. Guilford (1967) found, through factor analysis, that each individual should be described by a profile rather than a single score. He felt that factor analysis was essential in leading him to the view that there were five kinds of operations regarding performance: cognition, memory, divergent production, convergent production, and evaluation (Deese, 1993). These operations combine to produce 120 separate kinds of abilities in a model he called the Structure of Intellect, which detailed a more contextual, comprehensive viewpoint of intelligence. In Guilford's theory, as in Thurstone's, intelligence was viewed primarily as a series of overlapping mental abilities (Sternberg, 1981).

The theories of intelligence composed by Binet, Spearman, Terman, and Thurstone have come from the psychometric tradition of quantifying intellectual growth and identifying individual differences. In contrast to psychometric theories, Jean Piaget's theory of intellectual development focused on qualitative modalities of children's understanding and perception of their environs (Weinberg, 1989). Piaget's (1951) concept of intelligence and brain functioning studied how individuals acquire and apply learned knowledge. He viewed intelligence through biological adaption as "a certain

continuity exists... between intelligence and the purely biological process of morphogenesis and adaption to the environment” (Piaget, 1951, p. 1). His cognitive theory of psychology recognized two ways of adapting to the environment: assimilation and accommodation. Piaget (1952) further proposed that the internal organization of intelligence was manifested differently through age. This intellectual development resulted in developmental stages of sensorimotor (infancy), pre-operational (early childhood), concrete operational (middle childhood), and finally, formal operational (adolescence). These stages followed an invariant sequence, with each succeeding stage incorporating and extending the accomplishments of the previous one (Wagner and Sternberg, 1984). Piaget focused on the discovery of what and how children think; his theory was viewed strongly during the 1950s and 1960s. Although Piaget gave birth to a new field of cognitive psychology, it was not without criticism. One major criticism was the belief that a child’s level of development at one stage did not predict the level of development in the next stage (Beilin, 1989; Bjorklund, 1989; Small, 1990; Sugarman, 1989).

Although psychometric procedures assess what we know, and Piagetian perspectives probe how we think, there were some who have argued that both of these approaches do not account for specific processes involved in intelligent behavior (Seigler and Richards, 1982). The information processing approach is a step-by-step analysis of cognitive processes that have studied how individuals obtain and use information to solve problems. Campione and Brown (1978) and Carroll (1981) proposed that there is universality of information processing mechanisms regardless of the tasks or the

performer. Sternberg's (1985, 1988) triarchic theory of intelligence acknowledged the environmental context for all intelligence and emphasized cognitive component analysis to measure information processing skills and strategies. His triarchic theory was based on three aspects of intelligence: analytical (ability to analyze, evaluate, and compare), creative (the ability to create, design, imagine, invent), and practical (the ability to use, apply, utilize, and implement). The basic units of intelligence were components that were used to store information, make decisions, solve problems, and carry out problem-solving strategies. According to Sternberg (1994), individuals have different levels of triarchic abilities, yet in order to function successfully in the world, everyone needed at least some compliance in all three areas.

The IQ Controversy

Beyond the various theories of intelligence, there was a common denominator that intelligence can be quantifiably and reliably measured using a standard intelligence (IQ) test. Edwin Boring, a prominent psychologist in the 1920's, captured the essence of the testing movement with the saying, "intelligence is what tests measure" (Gardner, Krechevsky, Sternberg and Okagaki, 1994). Cronbach (1975) suggested that, even with the prevalence of IQ tests performed in schools and within industry, these tests have been continually criticized from their inception. Intelligence tests and aptitude tests have been criticized for fostering a narrow view of intelligence since the tests tended to measure a limited range of linguistic and logical-mathematical problem solving. Other criticisms of the IQ test have claimed that they only measure test taking skills, that they are biased against certain racial and economic groups, they are used to stigmatize low

scorers, and have little predictive power (Snyderman and Rothman, 1987). In Gould's (1981) best-selling book, *The Mismeasure of Man*, he wrote, "intelligence is so ephemeral that no one can measure it.... All that tests really accomplish is to label youngsters, stigmatizing the ones who do not do well and creating a self-fulfilling prophecy that injures the socioeconomically disadvantaged, in general, and blacks in particular" (Gould, 1981, p. 27-28).

Hereditary Versus Environment Debate

The underlying question surrounding IQ tests was whether or not intelligence is hereditary. Galton, who first studied the genetics of intelligence, transformed his views into the development of the individual intelligence test (Reynolds and Kauffman, 1985). He suggested that measurement of intelligence should be biological and physiological, such as studying the reaction time of individuals. Jensen (1969) had expanded Galton's perspective to include the notion that performance on cognitive activities, such as an individual's reaction time for recognition of simple patterns of lights and shapes, provided a starting point into the comprehension of the innate general intelligence factor "g." Jensen concluded that remedial educational programs during the 1960's were unsuccessful since the targeted populations were mostly black children, and that historically blacks as a population had exhibited average IQs substantially below those of whites. According to Jensen, success in school was related to intelligence and that intelligence had a large genetic component to it. Herrnstein and Murray (1994) concurred with Jensen that intelligence was largely endowed via heredity. In their book, *The Bell Curve*, they found that intelligence levels differed among ethnic groups and that

low intelligence among certain ethnic groups perpetuated a vast number of social problems in our society. Many have criticized Herrnstein and Murray for using the intelligence quotient to perpetuate stereotypes among races. Others have argued that instead of following the current trend of broadening the definition of intelligence, Murray and Herrnstein have reverted back to the unitary, classical notion that intelligence scores only match what society deems as intelligent or smart and are unchangeable throughout an individual's life.

Intelligence Testing

Snyderman and Rothman (1987) conducted a research study surveying one thousand psychologists and educational specialists to query the many facets of the IQ controversy. According to Snyderman and Rothman, the results of the study found those with expertise in IQ and testing to hold positive attitudes about validity and usefulness of intelligence and aptitude tests. Intelligence, as measured by intelligence tests, was viewed by the experts as important to success in our society. The majority of the respondents felt that the racial and socioeconomic status of IQ differences were partially hereditary. Intelligence test scores viewed by the experts were frequently misinterpreted as somewhat racially and socioeconomically biased and overemphasized by elementary and secondary school officials. Yet, even with that belief, Snyderman and Rothman concluded that the respondents were still generally in favor of the continued usage of intelligence and aptitude tests.

Although IQ tests had been used as guide posts for prediction of academic achievement, they did not predict future occupational success. McClelland (1973)

argued that intelligence tests had been correlated with each other and with grades in school, but not with other important occupational successes or life outcomes. This criticism that IQ tests were not a fair example of a person's entire repertoire of behavior portrayed that intelligence was not limited to what intelligence tests test (Weinberg, 1989). However, an active trend in the future theory and research in psychology has shown a broader conception of intelligence and the measure of a broader set of abilities underlying intelligence (Sternberg, 1986).

Foundation of the Theory of Multiple Intelligences

The traditional definition and view of intelligence had been the operational ability to answer items on intelligence tests. Intelligence tests scores inferred some underlying ability that was supported by statistical techniques which correlated test scores of subjects of different ages. These test scores corroborated the notion that the general faculty of intelligence, "g," was an inborn quality and does not alter with age or experience (Walters and Gardner, 1985). However the "g," or general intelligence theory, had often been criticized as being empirically and conceptually inadequate (Matthews, 1988). Howard Gardner, a Harvard psychologist, had begun to question these traditional notions of intelligence before he developed his theory on multiple intelligences. In his book, *Frames of the Mind*, Gardner (1983) challenged the prevailing concept of the unitary viewpoint of intelligence and sought to pluralize the scope of human achievement beyond the numerical confines of the IQ scores.

Gardner (1983) defined intelligence as the ability to solve problems that are valued in one or more cultural settings. He viewed intelligence as a biopsychological

potential whereby all individuals have the potential to exercise a set of intellectual faculties (Gardner, 1993). This pragmatic definition of intelligence went beyond determining human “smartness” from a score based on a standardized test to the valuing of the ability to solve real-life problems within the context of their cultural value. Smagorinsky (1991) further collaborated that the intelligent behavior can often be *problem solving*, but it can also be *problem finding* within the multiple intelligences framework.

The theory of multiple intelligences was framed in light of its biological origins and its value in one or more cultural settings. Blythe and Gardner (1990) described the theory of multiple intelligences as a more variegated and contextualized picture of intelligence, positing at least eight different kinds of intelligence. One particular critic of Gardner’s theory of multiple intelligences believes to “try to change psychology’s definition of intelligence is like trying to move gravestones in a graveyard” (Gardner, 1993, p. xii). Other critics questioned why Gardner insisted on defining intelligence in this new way and why he called them intelligences as opposed to talents or competencies. He addressed this topic in several interviews:

I’m deliberately being provocative.... If I’d said that there’s seven kinds of competencies, people would yawn and say “yeah, yeah.” But by calling them “intelligence” I’m saying that we’ve tended to put on a pedestal one variety called intelligence and there’s actually a plurality of them (Weinreich-Haste 1985, p. 48).

Another interview, conducted by Brant (1987), evoked the following sentiment from

Gardner:

I felt intelligence had been appropriated to refer to a very narrow band of abilities. So I deliberately tried to use the word in a new way to make people realize that there were a lot of tacit assumptions that needed to be confronted (p. 34).

Realizing that he was overextending the word intelligence beyond the normal usage in educational psychology, Gardner detailed a set of criteria for what counts as a human intelligence. One criteria was the potential of isolation by brain damage. Evidence from research in neuropsychology had shown that lesions in the brain that selectively impaired one type of intelligence might allow the other types of intelligence to remain intact (Armstrong, 1994). According to Gardner (1993), the consequences of such brain injury constituted the single most important indicator of evidence regarding distinctive separate intelligence. Another criteria was the existence of savants, prodigies, and other exceptional individuals. All of these individuals exhibited a single intelligence that operated at a high level while other intelligences function at low levels. A distinctive developmental history and a definable set of expert “end state” performances was another criteria. Gardner (1983) suggested that the culturally-valued intelligence followed their own developmental trajectory or pattern. These patterns arose on their own time during early childhood, on their own time during one’s lifetime, and on their own course as one gets older (Armstrong, 1994). A fourth criteria for an intelligence was an evolutionary history and evolutionary plausibility. From an evolutionary perspective, each intelligence needed to have its roots deeply embedded in the evolution

of human beings.

In addition to satisfying the aforementioned criteria, each intelligence required an identifiable core operation or set of operations. Each intelligence had a set of core operations that drove the various activities indigenous to that intelligence due to the activation or “triggering” of certain kinds of internally or externally presented information (Walters and Gardner, 1985; Armstrong, 1994). Another criteria for being an intelligence was that it needed to be susceptible to encoding in a symbol system. A symbol system is one that captures and conveys important forms of communication such as language, picturing, and mathematics. Lastly, an intelligence must have support from psychometric findings and experimental psychological tasks. Walters and Gardner (1985) suggested that this would include psychometric studies including examinations of the correlation among tests and psychological training studies of measures of transfer and generalization across tasks.

Gardner’s theory of multiple intelligences broadened the two most common types of intelligences, linguistic and logical-mathematical, to now include a total of eight. Gardner grouped the eight intelligences into categories. The first category was language-related intelligences which were linguistic and musical.

Linguistic intelligence is the capacity to think in words and to use language to express and appreciate complex meanings (Campbell et al., 1992). Miller (1990) further described the knowledge of language to include discovering what other people mean as well as developing an ability to convey one’s own intentions through the manipulation of the syntax of language. Authors, poets, journalists and speakers

exhibited a high degree of linguistic intelligence. As words and language are analogous to linguistic intelligence, so too are rhythm, pitch, timbre, and tone to musical intelligence. According to Armstrong (1994), musical intelligence was the “ability to perceive, discriminate, transform and express musical forms” (p. 2). Those demonstrating this intelligence included composers, musicians, critics, instrument makers, and sensitive musical listeners.

The second category of intelligence was called personal forms. These included interpersonal and intrapersonal intelligence. Gardner (1983) described interpersonal intelligence as the ability to focus on the perception and distinction of other people’s feelings, moods, intentions, and motivations. This intelligence was evident in successful teachers, social workers, actors, and politicians. Intrapersonal intelligence referred to the ability to perceive an accurate model of oneself through one’s awareness of his or her moods, strengths and limitations, temperament, and self-understanding. Individuals with strong intrapersonal intelligence include theologians, psychologists, and philosophers.

The last category of intelligence was called object related since it is the modality an individual utilizes in problem solving. These intelligences include bodily-kinesthetic, spatial, and logical-mathematical, and naturalist. Lazear (1991) described bodily-kinesthetic intelligence as the ability to use the body to express emotion, manipulate objects with deftness, play games or sports, and create a new product (as in invention). Individuals who possessed this intelligence were inventors, dancers, athletes, and acrobats.

Whereas the bodily movements were inherent in the bodily-kinesthetic

intelligence, sight and the ability to comprehend spatial information in the transformation of mental images were key elements in spatial intelligence. This intelligence involved an acute perception of color, line, form, and space (Armstrong, 1994). Sailors, artists, architects, surgeons, and engineers exhibit this type of intelligence.

Another object-related intelligence in problem solving skills was logical-mathematical. Both linguistic intelligence and logical-mathematical had been the two intelligences that standardized assessments tended to emphasize in our schools. Logical-mathematical intelligence incorporates the capacity to use numbers and reasoning skills effectively. Categorization, classification, and inference were among the logical-mathematical processes that were utilized. Gardner (1983) pointed out that one of the best descriptions of logical-mathematical thought was Piaget's theory of cognition; in particular his description of formal operational thinking. Mathematicians, engineers, physicists, computer programmers, and researchers demonstrate a high degree of logical-mathematical intelligence.

The last object-related intelligence was the naturalist. According to Gardner (1995), the naturalist intelligence referred to the ability to recognize and classify plants, minerals, and animals. Darwin would be the best example of portraying the naturalist intelligence because of his ability to delve into the nature of recognizing and classifying the nature of living things. Botanists, environmentalists, and paleontologists are those exemplify this type of intelligence.

Beyond the delineation of the eight intelligences and their criterion underpinnings, the theory of multiple intelligences proposed that each individual had

capacities in all of the aforementioned intelligences. According to Gardner (1993) every individual has a unique combination of all eight intelligences which are always interacting with one another. Armstrong (1994) went further concluding that most individuals fell in between the two continuum, “being highly developed in some intelligences, modestly developed in others, and relatively underdeveloped in the rest” (p. 11). Gardner (1993) advocated that most individuals, given the opportunity for enrichment, instruction, and encouragement could enhance all eight of the intelligences to a fairly high level of performance.

Matthews (1988), in a review of the literature of both empirical and theoretical support for the theory of multiple intelligences, concluded that due to its integrative possibilities and theoretical breadth, it was recommended for consideration in the field of gifted children. However, Matthews (1988) did point out that there was “little if anything in the way of hard evidence at this time for Gardner’s theory of multiple intelligences” (p. 102).

Gardner (1993) agreed that his theory had not been subjected to strong experimental tests within psychology. He further concluded that:

Multiple intelligences theory is not the kind of theory that is going to be proved correct or incorrect by a single study or even a programmatic set of studies from a single experimental laboratory. In this sense, it resembles the overarching theory of Darwin in evolution... (Gardner, 1994, p. 3).

To conclude, Gardner does not use quantitative data to substantiate his theory, rather he draws upon findings from anthropology to zoology to defend his notions.

Implementation of Multiple Intelligences in the Classroom and Its Impact

The Teele Inventory of Multiple Intelligences

To further examine the dominant intelligence of students, the Teele Inventory of Multiple Intelligences (TIMI) was developed in 1992 to demonstrate the intelligence students possess at the pre-school, elementary, middle school, and high school level. After an analysis of more than 6,000 inventories, it was found that students at the elementary level demonstrated a stronger preference for linguistic and logical-mathematical intelligence than students at the middle and high school levels. Teele (1996) further concluded that elementary students' most dominant intelligences were spatial, bodily-kinesthetic, linguistic, and logical-mathematical, while middle-level and high school students were found strongest in interpersonal, bodily-kinesthetic, spatial, and musical intelligence. Although many of the intelligences vary in dominance depending on the grade level, spatial and bodily-kinesthetic intelligences remained strong throughout all grades. According to Teele (1996), students entered elementary school with a strong preference in both linguistic and logical mathematical intelligence only to leave the high school level with a marked decline in dominance and interest in them, even though those two intelligences have been predominant in our educational system. Upon this analysis of multiple intelligences in the school, Teele has recommended that, because spatial and bodily-kinesthetic intelligences remain strong throughout all levels of school, educators should present purposeful, integrated, and meaningful information within the governance of the teaching/learning process so that it develops the intellectual potentials of all students.

Use of Musical Intelligence in the Classroom

The assumption that any individual who has studied, practiced, and then improved in any field is based on the premise that everyone has varying amounts of the multiple intelligences (Gardner, 1983). Although there is evidence that musical intelligence is organic, or genetic, research has shown that musical intelligence will not develop unless there is broad-based instruction (Colwell and Davidson, 1996). Music, like linguistic, spatial, and logical-mathematical intelligences, has a highly articulated notational system that is used to record, re-code, and solve problems. Oreck (1996) suggested that students who use notations to record their musical ideas have had an easier time learning to read other symbol systems. A report, compiled by the Music Educators National Conference, found that in 1987-1989, students taking music courses scored an average of twenty to forty points higher on both verbal and math portions of the Scholastic Achievement Tests than students who did not take such courses (Campbell et al., 1992). Within a multiple intelligences framework, the enhanced role of music and music ensembles in the school can promote goals of self-motivation, empathy, the reduction of school dropouts, violence, and other negative effects that have arisen from boredom and lack of positive peer interaction (Colwell and Davidson, 1996).

Influence of Spatial Intelligence on Students

Many educational programs have stressed the importance of abstract symbols and codes in reading, writing, and arithmetic and often have overlooked the aspects of spatial intelligence. Although visualization is a key ingredient in spatial intelligence, it is not directly related to sight and can even be highly developed in those who are blind

(Campbell et al., 1992). Dunn and Dunn (1978) found that 40% of school age learners are visual learners; 20% are auditory; and the remaining 40% have a mixture of auditory, visual, and kinesthetic preferences. McKim (1980) suggested that spatial thinking pervades all human activity. With the predominance of individuals utilizing spatial intelligence, educators could employ visual strategies in the classroom for students of all ages. Davis (1996) concluded that research at the Harvard Project Zero has shown that when art activities were scheduled for all students on Mondays and Fridays, it reduced the absentee rate on those days. LEAP (Learning Through an Expanded Arts Program), a program in New York City, has found that the stimulation and hands-on involvement with both art and music have helped students learn academic subjects. Standardized evaluations of LEAP students have shown that 95% of the students strengthened their problem-solving skills, 93.4% developed a better understanding of the subject matter, 96% strengthened their creative thinking skills, and 97% had a more positive attitude toward school (Dean and Gross, 1992).

The Personal Intelligence's Impact in the Classroom

Humphrey (in Bateson and Hinde, 1976) claimed that social intelligence was the most important feature in human intelligence. He further claimed that people could anticipate the behaviors of others and successfully cope with interpersonal issues. Thus, successful living in society could be portrayed as dependent on interpersonal intelligence (Campbell et al., 1992). In Goleman's theory of emotional intelligence, intelligence was both cognitive and emotional (self-awareness, motivation, empathy, and social skills) with the emotional ruling over the cognitive (Fogerty, 1998). Gardner had portrayed his

appreciation for the personal intelligence by pointing out that “many people with IQs of 160 work for people with IQs of 100, if the former have a poor interpersonal intelligence and the latter have a high one in the day-to-day world, no type of intelligence is more important than the interpersonal. We need to train children in the personal intelligence in school” (Goleman, 1995, p. 42).

The personal intelligences, intrapersonal and interpersonal, have become invaluable in the classroom in terms of teaching conflict resolution strategies, establishing modalities for positive relationships in the classroom, and the development and appreciation of multiple perspectives in a multicultural society.

The Kinesthetic Learning Experience

Since many academics hold other problem-solving modes in higher esteem, kinesthetic learning processes have been frequently undervalued in school. However, it is through our sensory motor experiences in life that bodily-kinesthetic intelligence has become our foundation of human knowing. Sillick (1996) stated that young children, in particular, experienced the world with the whole body and used body language to express how they felt. Kinesthetic learning has offered students the most potent and educational experiences for all learners (Campbell et al., 1992). Goodlad (1984) reported that regardless of the subject matter, students claimed that they liked activities that involved them actively, such as field trips, building things, acting things out, and carrying out projects. Griss (1994) found that bodily-kinesthetic intelligence can channel disruptive energy into creative paths which has lead to surprising amounts of

concentration and focus for the child who cannot stay in his or her seat.

Assessment Approaches of Multiple Intelligences

The multiple intelligences approach in the classroom has respected the various ways in which students learn. As with the recognition of the various intelligences in each individual, teachers have also recognized that student assessment needed to be varied. Teachers and schools that have applied the theory of multiple intelligences are challenged to find ways that adequately demonstrate students' understanding through the eight different intelligences.

The issues of assessment and reporting of student learning were not just challenging ones for schools employing the theory of multiple intelligences. This topic has been one of contention throughout the educational community. Although the debate continues over which grading and assessment practices have been most beneficial to students, researchers have agreed on several points. Frisbie and Waltman (1992) have found that grading and reporting were not essential to instruction. Teachers do not need reporting forms or grades to teach well. Learning was dictated by an interactive process by what teachers and students did in a classroom (Black and Wiliam, 1998). Teachers need to know how the students are doing, what they have learned, and what difficulties they have so that they can adapt their own work to meet the pupils' needs. Another point of agreement among researchers has been that no one method of grading and reporting can serve all purposes well (Guskey, 1994). Grading had enabled teachers to communicate to parents and others the achievements of students, provide incentives to

learn, and supply information for students' own self-evaluation. Payne (1974) described letter grades as a means to identify learning processes and to give some notion of their adequacy. However, Stiggins (1994) found that letter grades required a great deal of abstracting of information into a single symbol and cut off between grade categories as arbitrary and difficult to justify.

The other end of the grading continuum that has used more detailed methods such as narratives and checklists also has had its pros and cons. Narratives and checklists of learning outcomes have offered specific documentation for the learning process. However, from a teacher's perspective, they have taken a lot of time to prepare and often parents found them too complicated to understand. Cangelosi (1990) has concluded that if no one method of assessment will serve all purposes, schools must then identify and develop their primary purposes for grading. This process, however, has often been very tedious since consensus among various constituencies was a difficult task to perform.

The current trend now has moved away from a testing culture, where teachers dictate all of the learning and students work alone, to an assessment culture where teachers and learners interact in the learning and assessment process (Seeley, 1994). Black and Wiliam (1998) have defined the term assessment to refer to all of those activities undertaken by teachers and their students that provide information to be used as feedback in order to modify teaching and learning practices. These learning practices or criteria, when related to grading and reporting were deemed more preferable by teachers and students since they seemed more fair (Kovas, 1993).

In discussions of assessment reform, the terms alternative assessment, authentic assessments, and performance-based assessment are often interchanged. The term alternative assessment applied to any assessments that differed from most standardized approaches in the classroom such as multiple choice and one-shot tests (Marzano, Pickering and McTighe, 1993). Wiggins (1989) defined authentic assessment approaches as those that engaged students to apply knowledge and skills that can be utilized in the “real world” outside of school. Performance-based assessment has referred to a variety of tasks whereby students had to demonstrate their understanding of learned material and apply it in various modes of context. Herman, Aschbacher, and Winters (1992) reported that alternative assessment, authentic assessment, and performance-based assessment meant “variants of performance assessments that required students to generate rather than choose a response” (p. 2). Regardless of the different terminology, these reforms in the grading and reporting mechanisms were alternatives to the traditional multiple-choice standardized tests that were a direct description of student performance.

One method that many schools, including MI schools and non-MI schools alike, had found to be helpful in the assessment of students’ applied knowledge has been the use of portfolios. Vaurus (1990) defined a portfolio as a “systematic and organized collection of evidence used by the teacher and student to monitor growth of the student’s knowledge, skills, and attitude in a specific subject area” (p. 48). Portfolios were a deliberate, specific collection of a student’s accomplishments that had formed a more complete picture of the pupil as a lifelong learner (Burke, 1993). Many portfolios

have contained a variety of assessments such as journals, videos, pictures, projects, observation checklists, and written logs. Portfolios can cover one or multiple subject areas that can be conclusive over a one year period or passed on from year to year. This type of assessment has required students to collect and reflect on examples of their work, creating opportunities for students to make connections between prior knowledge and new learning. Well-designed portfolios have been heralded as vehicles that provide a more equitable and contextualized portrait of what an individual knew and expressed.

With a dearth of empirical research on portfolios (Herman and Winters, 1994), most studies explained the rationale for portfolio assessments; few discussed accepted technical methods of employment beyond the areas of reliability and validity. Have the results of portfolio assessment provided reliable, consistent, and meaningful estimates of what students knew and did? Evidence has suggested that one basic requisite for technical quality -- interrater reliability -- could be achieved (Herman and Winters, 1994). The research on the impact of portfolio assessment on curriculum and instruction has been unclear thus far. Yet most educators believe that the use of portfolios has encouraged productive changes in instruction, curriculum, and student learning. Farr and Tone (1994) suggested that although portfolios were not the panacea to correct all the concerns about assessment, they have become an important link in a comprehensive evaluation and assessment program.

Assessment procedures have to be an integral goal of the learning process. Through the clarification of student learning performances, the main goal of any assessment vehicle has been the ability for overall improvement in teaching and

instruction. Gardner's (1983) definition of intelligence as the ability to solve problems or create products that are valued in a specific cultural setting can be applied to student assessment. Student performance and depth of understanding can be measured through multiple types of assessments in the forms of the products students have developed, demonstrated, created, and solved (Teele, 1996). Through the integration of multiple intelligences into the assessment process, students have reflected the different ways of student learning through portfolios, videos, debates, classroom demonstrations, exhibitions, peer reviews, and problem solving situations.

Summary and Conclusion

Since the inception of his book *Frames of the Mind* in 1983, Gardner's theory of multiple intelligences has been implemented by many educators in their classrooms. Fogarty (1998) claimed that an "intelligence-friendly classroom" is a classroom that embraces the governance of the teaching/learning process in such a way that it developed the intellectual potential of all students. To this end, teachers have applied the theory in ways that they considered most appropriate for their students, school, and community (Campbell, 1997). Campbell's (1997) research has concluded that educators utilized and interpreted the theory of multiple intelligences in several different approaches, including: an instructional process that provided entry points into lesson content, a means to teach students self-directed learning skills through a project-based curriculum, the creation of interdisciplinary curriculums, and the establishment of apprenticeship programs with community experts to teach students real-life skills.

The evolution of the concept of intelligence has gone through many definitions

and most likely will continue to evolve as long as humankind continues its fascination with it. Thurstone (1938), Guilford (1967), Sternberg (1981, 1986, 1988, 1994), and Gardner (1983, 1993, 1994, 1995) have changed the unitary scope of intelligence, and their theories have added a multiple dimension to the concept of intelligence. Many educators question why Gardner's theory of multiple intelligences has taken precedence over other multiple theorists. Perhaps it was the timing. Gardner's theory coincided with an insurgence of an underlying quest educators had for validating something that they inherently knew about students -- that each had a different set of strengths and talents. The theory of multiple intelligences validated the recognition of these different student strengths. This theory became even better known among educators after a plethora of books and seminars (not always with Gardner's stamp of approval) interpreted the theory into practical applications into the classroom.

Gardner's assertion that all individuals manifest differing degrees of eight specific types of intelligence has altered the way some educators develop instructional methods for students. In the past, teaching methodologies, tests, and written class assignments have heavily focused on the linguistic and logical-mathematical intelligences and may have overlooked the talents and abilities of students who are stronger in the other six areas of learning.

Howard Gardner's theory of multiple intelligences has allowed teachers to expand their view of student abilities and talents through the guise of intelligence. Whether it was Gardner's (1983, 1993, 1994, 1995) eight intelligences, Sternberg's (1981, 1985, 1986, 1988, 1994) successful intelligence, or Goleman's (1995) emotional

intelligence, they all garnered everyone's attention simply by the use of the word "intelligence." Intelligence has been considered a powerful word in our society. However, through the attention of Gardner's work, it has taken on a multi-dimensional definition. Along with adding a broader definition of what intelligence was, Gardner's theory has also challenged old paradigms found in the realm of education and learning. Through its myriad ways of expressing knowledge, the theory of multiple intelligences also has warranted multiple ways of assessing it. Yet, as with all theories, the test of time will reveal the practicality and application of a Gardener's tenets. One thing is for sure, educators will continue to search for new ways of improving student learning and maximizing how knowledge can be portrayed and taught.

CHAPTER THREE

Methodology

Educational research has been built upon the foundations and pillars of research methods and traditions found primarily in the world of biological and physical sciences. However, in the last thirty years another paradigm for educational research has gained recognition among researchers. This model, called qualitative research, was the thrust of this study. There are some general characteristics found in qualitative research. In qualitative research, inductive data analysis is used whereby the researcher first obtains the data and then tries to develop understanding from the data to draw generalizations from the data (Borg and Gall, 1989). Another characteristic of the qualitative model is that a holistic inquiry is completed in a natural setting or in the field. This is where the investigator attempts to study all of the elements present in the inquiry taking place that encompasses the social, cultural and historical aspects occurring in the setting. In addition, elements of ethnographic research can be incorporated to enrich the data collected.

The purpose of this chapter is an explanation of the methodology that created this qualitative study. A discussion of the purpose of the study, need for the study, the use of the survey method, the survey population, the design of the study, the analysis of the data, and the limitations of the study are presented in this chapter.

Purpose of the Study

The purpose of this study was to determine the commonalities among those elementary schools in the United States that have implemented three years or more of

Howard Gardner's theory of multiple intelligences. Many schools throughout the country have attempted to incorporate Gardner's theory of multiple intelligences; however, to date there has been minimal investigation of the multitude of schools that have implemented this theory. With this premise in mind, the researcher proposed a study that would evaluate elementary schools to discern if there are any identifiable commonalities of effective applications of the theory of multiple intelligences among them. Specifically, this dissertation addressed the following primary research question:

What were the commonalities of effective applications of the theory of multiple intelligences among the elementary schools investigated? Applications of this theory involved examining curriculum implementation and teacher collaboration, instructional methodology, and academic assessment.

Need for the Study

When Gardner developed his theory of multiple intelligences, he did not propose any particular pedagogical methodology for implementation. Given the absence of pedagogical guidelines and approaches for implementation of this theory, the investigator examined 20 schools that have been utilizing the theory of multiple intelligences to ascertain how they have adopted the theory and what resulting outcomes have emerged. By understanding how teachers, principals, students, and parents responded to an environment where multiple intelligences were integrated, this study culminated in guidelines of effective application strategies of the theory for schools to utilize for future practice.

The Use of the Survey Method

For this study, the survey method was employed. Fink and Kosecoff (1985) described a survey as “a method of collecting information directly from people about their feelings, beliefs, motivations, and personal, educational, and financial backgrounds” (p. 13). Research studies involving surveys account for a substantial proportion of the research done in the field of education. Lazarsfeld and Seiber (1964) completed a content analysis of educational research appearing in 40 journals and found that more than a third of them used the survey method.

The questionnaire and individual interviews are the most common instruments for data collection in survey research. Sudman and Bradburn (1974) presented a model that described the relationship among the interviewer, the respondent, and the task to determine the outcome in the survey interview. The *interviewer*, as the agent of the researcher, was seen as the most responsible for the outcome of the data collection process. The *respondent* and the role played was one of a relatively passive actor in the research process. The primary demand of the respondent’s role was that the interviewer’s questions were answered. The *task* is structured to accomplish the research goals and the data analysis. The task included the length and the location of the interview, the question wording, questionnaire construction, and types of data sought. The *responses* were the outcome of the data collection and raw material for survey analysis.

Survey Population

Thirty names of schools that have implemented the theory of multiple

intelligences were attained from the Development Group of Harvard Project Zero.

Project Zero was founded at the Harvard University Graduate School of Education in 1967. The Development Group directed by Howard Gardner used its understanding of human development to investigate and design innovative programs in the arts and other disciplines for instruction and assessment. Gardner's theory of multiple intelligences has been a major topic of research for the group. There were 30 school leads obtained from the Development Group of Harvard Project Zero. Four additional MI schools were identified by the researcher through the Internet. In this particular study, elementary schools (PreK-8) in the United States were utilized. This population of thirty-four schools implemented the theory of multiple intelligences for more than three years with varying degrees of usage. For this study, a criterion set for school-wide implementation was 80% of the classes have been implementing this theory. Out of the 34 elementary schools which have implemented MI theory as of the 1997-1998 academic year, 20 schools elected to participate in this study. The twenty schools that participated in this study came from the following geographical areas in the country: 50% from the East Coast, 30% from the Midwest, and 20% from the West Coast/Southwest regions of the United States. The type of schools consisted of seventeen public schools and three private, independent schools. The following is a brief description of the twenty schools that participated in the study (code numbers were given to each school to ensure anonymity and confidentiality):

School Code #

- (1) 0003 – East Coast public school located twenty-five miles outside a mid-

size city. Where the school presided in was considered a farming community.

Student ethnic population was 57% Hispanic, 48% Caucasian, and 5%

African-American. Family SES level was 70% eligible for reduced and free lunch, 20% middle-middle class, and 10% lower-middle class.

(2) 0005 – West Coast public school located on the east side of a mid-size urban city. Although the school had a city zip-code, the diverse community that the school resided in was considered suburban. Student ethnic population was 58.1% Caucasian, 20.9% Pacific-Rim/Asian, 11.9% African-American, 6.1% Hispanic, and 2.2% Native-American. Family SES level was 60% were eligible for reduced and free lunch, 30% lower-middle class, and 10% middle-middle class.

(3) 0006 – Southwest public school located in the largest city in the state. Although the school had a city zip code, the community that the school resided in was considered Suburban. Student ethnic population was 54% Caucasian, 33% Hispanic, 6% Native-American, 4% African-American, 2.1% Pacific Rim, and 1.1% Other. Family SES level was 46% were eligible for free and reduced lunch, 22% lower-middle class, 20% middle-middle class, and 12% upper-middle class.

(4) 0008 – East Coast public school located fifty miles from a very large urban city. The school resided in a suburban, residential area. Student ethnic population was 90% Caucasian, 5% African-American, and 5% Other. Family SES level was 30% upper-middle class, 30% middle-middle class, 31%

lower-middle class, and 9% eligible for free and reduced lunch.

(5) 0009 – Midwest public (charter) school located in the center of a large city. Although the school is located in the midsection of the city, it was considered a residential part of the city. Student ethnic population was 50% Caucasian, 43% African-American, and 7% Other. Family SES level was 38% eligible for free and reduced lunch, 22% middle-middle class, and 20% upper-middle class.

(6) 0010 – Midwest public school located one hour outside a very large urban city. The school resided in a small, developing suburban town. Student ethnic population was 94% Caucasian, 3% Hispanic, 2% African-American, and 1% Pacific-Rim. Family SES level was 65% middle-middle class, 34% upper-middle class, and 1% eligible for free and reduced lunch.

(7) 0012 – East coast magnet public school located in a mid-size city. Being a magnet school, the school population draws from the entire urban and surrounding areas. Student ethnic population was 50% Caucasian, 47% African-American, and 3% Pacific-Rim. Family SES level was 36.5% upper-middle class, 36.5% middle-middle class, and 27% eligible for free and reduced lunch.

(8) 0013 – Midwest private school located in a large urban city. Although the school is located in the central area of the city, the student population draws from fifty different zip codes. Student ethnic population was 33% Caucasian, 30% African-American, 15% Hispanic, 10% Pacific-Rim, and 12% Other.

Family SES level was 25% upper class, 25% upper-middle class, 25% middle-middle class, and 25% lower-middle class.

(9) 0014 – East coast public school located in a mid-size urban city. The school resided in an urban renewal area full of project housing and state subsidized apartment houses. Ethnic population was 70% African-American, 20% Caucasian, and 10% Other. Family SES level was 95% eligible for free and reduced lunch, and 5% lower- middle class.

(10) 0016 – Midwest public school located twenty miles outside a mid-size urban city. The school was located in a suburban, growing community. Student ethnic population was 98% Caucasian, and 2% African-American. Family SES level was 50% upper-middle class and 50% middle-middle class.

(11) 0017 – East coast public school located in a mid-size town. The school resided in a suburban, residential community. Student ethnic population was 85% Caucasian, 10% Hispanic, and 5% African-American. Family SES level was 50% upper-middle class, 30% middle-middle class, 10% lower-middle class, and 10% eligible for free and reduced lunch.

(12) 0018 – East coast public school located in a mid-size urban city. The school resided in an established residential area on the south side of the city. Student ethnic population was 56% Caucasian, 29% African-American, and 15% Hispanic. Family SES level was 69% eligible for free and reduced lunch, 16% middle-middle class, and 15% lower-middle class.

(13) 0019 – West coast private school located outside a mid-size city. The

school was located in a rural, suburban farming community. Student ethnic population was 96% Caucasian, 3% Pacific-Rim, and 1% African-American. Family SES level was 90% middle-middle class, 6% lower-middle class, and 4% upper-middle class.

(14) 0020 – East coast public school located one mile outside a small urban city. Student population comes from rural, urban and suburban communities. Student ethnic population was 99% Caucasian, and 1% African-American. Family SES level was 50% lower-middle class, 40% middle-middle class, and 10% upper-middle class.

(15) 0023 – Midwest public school located in a mid-size city. The school resided in a well-established residential community. Student ethnic population was 70% African-American, and 30% Caucasian. Family SES level was 49% eligible for free and reduced lunch, 30% middle-middle class, and 19% lower-middle class.

(16) 0024 – East coast public school located in a mid-size city. Although the school is located in an affluent suburban community, the student population was drawn from many different areas of the city. Student ethnic population was 53% Caucasian, 43.8% African-American, 2% Hispanic, and 2% Pacific-Rim. Family SES level was 40.5% eligible for free and reduced lunch, 25.5% upper-middle class, 20% middle-middle class, and 15% lower-middle class.

(17) 0025 – East coast public school located outside a mid-size city. The school resided in a well-established growing residential community. Student

ethnic population was 75% Caucasian, and 25% African-American. Family SES level was 78% lower-middle class, and 32% eligible for free and reduced lunch.

(18) 0026 – East coast public school located in a small rural area. Student ethnic population was 99% Caucasian, .5% African-American, and .5% Pacific-Rim. Family SES level was 60% eligible for free and reduced lunch, 20% upper-middle class, and 20% middle-middle class.

(19) 0028 – Midwest private school located ninety miles outside a very large urban city. The school resided in a well-established residential area. Student ethnic population was 99% Caucasian, and 1% African-American. Family SES level was 75% middle-middle class, and 25% upper-middle class.

(20) 0029 – West coast public school located twenty miles south of a large city. The school resided in a suburban, residential community. Student ethnic population was 78% Caucasian, 13% Pacific-Rim, 4% African-American, 4% Hispanic, and 1% Native American. Family SES level was 40% lower-middle class, 30% middle-middle class, 16% upper-middle class, and 14% eligible for free and reduced lunch.

Design of the Study

The design of this study was primarily qualitative in that a telephone survey was administered to principals and a mail-in questionnaire was administered to teachers. Elements of ethnographic non-participant observation and face-to-face interviews with teachers, principals and parents was the second part of the qualitative design.

The main data collection instruments proposed in the study were cross-sectional surveys. There were two surveys designed to collect data: one for the principals in the schools and one directed toward the teachers. The principal survey was in the form of an interview guide that was developed by the researcher. The purpose of the principal survey was to obtain information regarding school implementation strategies and applications of the theory of multiple intelligences. The teacher mail-in survey obtained more specific information discerning classroom applications of the theory of multiple intelligences. On both the principal and teacher surveys, the respondents were able to make more than one response to each category of questions. Additional principal and teacher interview sheets, and observation check-off sheets were developed for the ethnographic site visits to obtain more specific demographic and idiosyncratic aspects of the site schools chosen.

To ensure the reliability and validity of the data collection instruments used, several procedures were completed. According to Fink and Kosecoff (1985) the best approach to establish reliability and validity of surveys is by pilot testing it. Prior to the actual principal interviews, a pilot test on the principal survey was performed on a sample of four principals regarding the survey form. This pre-test ascertained the reliability of the survey which focused on the clarity of the questions and the general format. The researcher used a pre-testing strategy proposed by Belson (1968) which asked the respondents to repeat their understanding of the meaning of the question in their own words. The questions were then revised and retested until they were understood by all members of the pre-test sample. To establish reliability of the teacher

survey questionnaire, the same pre-testing strategy was performed on a sample of three teachers who were familiar with and were utilizing the theory of multiple intelligences.

Fink and Kosecoff (1985) further state that pilot testing also bolsters validity since it can ensure that all topics and a sufficient variety in the responses to be studied are included in the surveys. Prior to the actual research, the researcher visited one MI school as part of the pilot test. The school was located geographically to the researcher and was on the Project Zero's list of schools. Although the school was excluded from the researchers survey population since it only went up to the second grade, the researcher felt it was an excellent school to use for the pilot test since it met all of the other study's criteria. By visiting an MI school, the investigator could ascertain other dimensions of the MI school culture which may not have otherwise been taken into account. Observations in the classroom, discussions with the principal and teachers, the use of all principal and teacher surveys, and interview and classroom observation sheets were utilized during this preliminary site visit. This allowed the researcher to make sure that the items on the questionnaires represented the content that the questionnaires were designed to measure. There were minimal changes made to the above mentioned data collection instruments. Additionally, as part of the ethnographic aspect of this study, three schools were chosen out of the twenty schools that participated in this study. These three schools were chosen since they represented an accurate representation of the way the theory of multiple intelligences was applied in a school setting. Through these representational schools, the site visits addressed an additional validity measure since the site visits confirmed no additional information that was not found on the survey

instruments.

The principal interview guide consisted of 14 mixed, fixed-choice, and open-ended items (Appendix A). Patton (1990) stated that the definition of an interview guide is “a list of questions that are explored in the course of an interview and is prepared in order to make sure that basically the same information is obtained from a number of people by covering the same material” (p. 200). The advantage of an interview guide for the researcher is that it ensured the interviewer has carefully used the limited time available in the interview situation. The fundamental purpose of qualitative interviewing is to provide a framework within which respondents can express their own understandings in their own terms (Patton, 1980).

A letter explaining the reason for this interview was sent out to the principals of each selected elementary school (Appendix B). According to Borg and Gall (1989), contacting respondents before doing a questionnaire has been found in several studies to increase the response rate. After the introductory letter was sent out, follow-up calls were made to schedule the interviews with the designated principals. The researcher proposed to interview the principals over the phone as opposed to face-to-face interviews. Although reduced cost is probably the greatest advantage of using the telephone method, the busy schedules of the principals also had been taken into account. Lavrakas' (1987) research showed that telephone interviewing reached almost the same proportion of the target population, obtained nearly as high a percentage of returns, and produced comparable information at about one-half the cost of personal interviews. The telephone interviews with the principals lasted approximately thirty minutes or more.

Extensive note-taking was the method the researcher used for preserving the information collected during the interviews.

The purpose of the principal surveys was to obtain generic information regarding their school implementation strategies and applications of the theory of multiple intelligences. To obtain more specific information discerning classroom applications of the theory of multiple intelligences, permission to interview at least two third or fourth grade teachers per school was requested by the researcher from each principal. The third and fourth grades were chosen by the researcher since they were a middle point between kindergarten and sixth grade. A letter explaining the purpose of the study and the necessity of obtaining a teacher's perspective in implementing the theory of multiple intelligences was sent along with the teacher questionnaire (Appendix C). The second survey questionnaire for the teacher was developed by the researcher and consisted of 15 fixed and open-ended items (Appendix D). Recognizing the teacher's limited time during the day, the investigator did not feel that the method of phone interviewing was appropriate. Thus, the questionnaire was completed by the teachers themselves and sent back in a self-addressed, stamped envelope to the researcher within one week.

For this study, beyond the principal and teacher surveys, triangulation of the data was further obtained through an ethnographic study of three schools. The investigator used several methods to obtain data. The use of multiple methods of collecting data to study the same phenomena is what Denzin (1978) called triangulation. Denzin (1978) explained that the logic of triangulation was based on the premise that "no single method ever adequately solves the problem of rival causal factors... Because each method reveals

different aspects of empirical reality, multiple methods should be used in every investigation if possible” (p. 28). The purpose of this ethnographic study of three schools was to provide a more in-depth study of the way they implemented the theory of multiple intelligences. These three schools were selected from the twenty schools that participated in the study. They were chosen for the following reasons: each school represented three separate geographic locations in the United States, they were an accurate representation of the schools that were implementing MI, and there was a willingness on behalf of the school personnel for visitation to their schools. The three schools in the study represented separate geographic locations in the United States: the East Coast, the Midwest, and the Southwest regions.

School A represented the East Coast region and was located in a growing, mid-size city that represented a diverse population of both ethnic and income levels. This public school, representing kindergarten through fifth grade began implementing MI in 1994. School B represented the Midwest geographic region of the United States and was ninety miles north of a very large urban city. It was a pre-K to eighth grade private, independent school located in the second largest city of their state. School B began implementing the theory of multiple intelligences in 1988. School C represented the Southwest/Western geographic region and was located in the largest city in the state. Although the school had a city zip code, the school resided in a residential, suburban area with many strip malls and apartment buildings. This school (kindergarten through fifth grade) had a diverse student ethnic population and SES level and began implementing the theory of multiple intelligences in 1989.

According to Borg and Gall (1989), an ethnography is defined as an in-depth analytical description of an intact cultural setting. The central aspect of ethnographic research is that the researcher uses continuous observation either through audio, video recordings or copious notes during observation. Borg and Gall (1989) claim that through observation a researcher can gain insights and rapport with the group being observed to develop a better understanding of the group's functions and relationships. For most educational studies, especially those concerned with classroom interactions, most educational researchers generally have used nonparticipant observation with the use of lengthy handwritten notes of the classroom activities and interactions (Borg and Gall, 1989). A nonparticipant observer has minimal interaction with the subjects being observed and tries to obtain a record of the activities being observed without being too obtrusive. For this study, methods of nonparticipant observation in the classroom, and face-to-face interviews with teachers, parents and principals were performed by the investigator for the school site visits over a two-day period. An observation checklist was designed based on the results of the principal and teacher survey responses and the review of the literature (Appendix E). Broad dimensions of physical setting, instructional methodology, assessment, and student-teacher interactions related to MI were observed. The site visit interview with the teacher included an open-ended questionnaire related to the teacher's individual understanding of MI theory, and the application of this theory to their students and themselves (Appendix F). The principal interview provided demographic information as well as their perceptions of the overall application of MI theory in their schools (Appendix G).

The teacher site visit interview questionnaire and the principal site interview questions were piloted with the same principals and teachers who reviewed the first set of survey questions. This pilot test ascertained the reliability of the questions which focused on clarity of questions and general format. The observation checklist was utilized during the site visit to a local MI school and refined by the researcher based on clarity, flow and understanding.

The researcher first overviewed the schools being observed, including principal, teacher, and non-teaching staff in a variety of settings, such as in the classroom, cafeteria, playground and faculty lounge. After obtaining an overview of the three selected MI schools, it was important for the investigator in this study to limit recording only those phenomena that were most relevant to the topic being studied. LeCompte and Goetz (1982) assert that in most social situations, such as in a classroom, the amount of interaction among everyone is too complex for even a team of observers to record. Thus, the researcher in this study included in the recording protocols phenomena related to curriculum implementation and teacher collaboration, instructional methodology, and academic assessment as it related to the theory of multiple intelligences. By observing how the theory of multiple intelligences was practiced within the classrooms, it helped the researcher supplement the first phase of data collected in the principal interviews and teacher surveys.

Analysis of the Data

After the researcher completed the principal telephone interviews and received the completed teacher questionnaire surveys, a content analysis was conducted on both

in an effort to interpret and corroborate the data. One of the objectives of a content analysis study in education is to produce descriptive information. According to Berelson (1952), “a content analysis is a research technique for the objective, systematic, and quantitative description of the manifest content of communication” (p. 18). Krippendorff (1980) further added to this definition by stating that a content analysis is a research technique for making replicable and valid inferences from analyzed data to the context of the inquiry. The main objective of this study was to ascertain if there are any commonalities among the variables of curriculum implementation and teacher collaboration, instructional methodology, and academic assessment procedures in those elementary schools employing the theory of multiple intelligences. Using these above variables, the investigator in this study developed a classification system based upon these content categories. The method of summarizing the content analysis data is through the use of absolute frequencies or the numbers of specific incidents found in the data.

Limitations of the Study

Thirty of this study’s population was limited to those schools obtained through Harvard’s Project Zero that have implemented the theory of multiple intelligences for three years or more. There were also four schools that were not on Project Zero’s list that had come to the attention of the researcher of this study. However, there may be schools that have escaped the attention of Project Zero and the researcher and they would have not been included in this study. The study was limited to elementary schools, even though there were several secondary schools that have implemented the

theory of multiple intelligences. Thus, the results from this study cannot be generalized beyond what is appropriate for elementary schools. The data collected from the principals interviewed and teachers surveyed for the study was based on the respondents' answers to the questions on the survey. Thus, the answers to these questions are limited to the truthfulness of the respondents in the study.

CHAPTER FOUR

Data Analysis and Findings

The purpose of this chapter is to present the analysis and findings of the data from the principal interview questionnaire, the teacher survey questionnaire, and a detailed account of the three MI schools visited by the researcher. A summary of the study and methods used to address the stated research question was also reported. This chapter includes the following subsections: summary of the study, participants in the study, findings of response results from principal interview survey and teacher questionnaires, findings of MI curriculum implementation and teacher collaboration, findings of instructional methodologies, findings of assessment approaches, and summary of the MI school visitations.

Summary of the Study

The purpose of this study was to examine the commonalities among 20 elementary schools in the United States that have implemented the theory of multiple intelligences for three or more years. When Gardner (1983) developed his theory of multiple intelligences, he did not propose any particular pedagogical methodology for its implementation. Because of the absence of pedagogical guidelines and approaches, this study intended to provide effective strategies for the future application of this theory in schools through understanding how teachers, principals, parents, and students respond in an environment into which the theory of multiple intelligences is incorporated.

The research design employed for this study was the survey method. The data collection instruments utilized in the study were two cross-sectional surveys. The first survey was a principal questionnaire in the form of an interview guide, including 14 items. Through the interview guide survey, the researcher was able to obtain generic information from the principals regarding school implementation strategies and applications of the theory of multiple intelligences. Taking into account the principals' busy schedules, the investigator conducted telephone interviews. To obtain more specific information on how the theory of multiple intelligences is applied in the classroom, permission was granted to the researcher by each principal to send a teacher questionnaire to at least two or more third or fourth grade teachers per school. Of the 41 questionnaires sent out, 18 teachers representing 13 schools responded and participated in the study.

Data collected from these qualitative principal interviews and teacher questionnaires were compiled and analyzed. The data obtained from the principal and teacher surveys were triangulated through site visits to three schools that have implemented the theory of MI. The researcher visited one East Coast school, one school located in the Midwest, and one school located in the Southwest region of the United States. The researcher gathered data through participant observation in the classrooms and face-to-face interviews with principals, teachers, and parents over a two-day period.

The study was guided by one primary research question: What were the major identifiable commonalities of effective applications of the theory of multiple intelligences among those elementary schools investigated? Answering this question involved

examining the applications of curriculum implementation and teacher collaboration, instructional methodology, and academic assessment.

Participants in the Study

The population for this study consisted of thirty-four elementary schools throughout the United States that have been implementing the theory of multiple intelligences for three years or more. The names of thirty schools was attained from the Development Group of Harvard Project Zero. Researchers at Project Zero, which is directed by Gardner, have identified schools that have taken his theory and have been implementing it for three years or more. The remaining four MI schools that met the study's three year or more implementation criterion were identified by the researcher through the Internet.

A cover letter was sent to all 34 schools in which the principals were asked to participate in the study. Of the 34 schools, 20 school principals agreed to participate. The names of 41 teachers were obtained from the principals and questionnaires were then sent to those teachers. Of the 41 teachers contacted, 18 responded to the questionnaire. The three MI elementary schools selected by the researcher for two-day site visits were chosen on the basis of geographical regions representing the East Coast, the Midwest, and the Southwest areas of the country. Two of the elementary schools are public and the third school represents the private, independent sector.

Principal Interview Survey and Teacher Questionnaires Results

Twenty principals out of the 34 initially contacted by letter agreed to a scheduled 30 to 45 minute telephone interview with the researcher. This is an overall response rate

of 58%. Seventeen public elementary schools, including charter and magnet schools, participated in the study as well as three private schools. Geographically, 50% of the schools are located in the East Coast, 30% are in the Midwest, and 20% are in the West Coast/Southwest regions of the United States. Although the MI implementation criterion for the study is three years, the median number of years of implementation of this theory among these schools is six and a half years, with a range between three and twelve years.

The reasons for the lack of participation of the other 14 school principals that did not respond to the study are presented in Table 1.

TABLE 1
Reasons for Non-Participation of Principals in Survey
 n=14

Number of Principals	Reasons	%
1	School no longer implementing MI.	7%
3	The school is not doing much MI in the curriculum.	21%
2	Was a new principal and too busy to participate in the study.	14%
1	Was a new principal and MI was not now the focus of the school.	7%
1	Not interested in participation, stated "no reason."	7%
6	No response to the initial letter or to the three follow- up calls.	43%

The principal who responded that the school was no longer implementing MI claimed that after seven years of implementing the theory of multiple intelligences in the school, MI did not work as reflected by the scores on the standardized tests. As a new principal, he chose to change the curriculum and stated: "MI is a bad word around here. We are going back to the back-to-basics curriculum."

The instrument used to interview the principals in this study was a survey in the form of an interview guide developed by the researcher. This interview guide consisted of 14 mixed, fixed-choice, and open-ended items. The researcher scheduled specific appointment times with each principal based on the principal's schedule. During the 30-45 minute phone interview, the researcher took notes while the principal answered the questions stated on the interview guide.

When the interview was completed, the researcher asked each principal for the names of teachers, preferably those in third or fourth grade, who might be interested in completing a teacher questionnaire. Two questionnaires were sent to each school, with the exception of one school which requested three of them. The principals distributed the questionnaires to the teachers whom they asked to participate in the study. After completion, the teachers then mailed the questionnaires to the researcher. The questionnaire consisted of 15 open-ended and fixed items. Out of the 20 schools selected, 13 responded. This resulted in a school response rate of 65%. Of the 41 questionnaires that were sent to the teachers, eighteen were received back by the researcher, resulting in a 44% response rate. Three of the schools had two respondents each to the questionnaire, one school had three respondents, and nine schools each had

one respondent. The reasons for the teachers from the remaining seven schools that did not respond to the questionnaire are given in Table 2.

TABLE 2
Reasons for Non-Participation of Schools in Teacher Questionnaire

n=7

Reasons	Freq.	%
Questionnaire took too much time to complete.	2	28%
Teachers too busy.	2	28%
Missed due date and disregarded questionnaire.	1	14%
Did not remember receiving questionnaire.	1	14%
Personal crisis that limited time to complete.	1	14%

Of the 18 teachers who answered the questionnaire, the average number of years in the teaching profession was 14.6 years, with the range from 4 to 33 years. The average number of years these teachers have been implementing MI in the classroom was 5.7 years, with a range of 1.5 to 9 years. Gender, level of education, and extent of formal and informal training in MI were not included in the demographic data collection from teacher participants and may affect the generalizability of this study.

Findings of Curriculum Implementation and Teacher Collaboration: Principals' Responses

One of the most important components for implementing any educational venture is staff development (Bradley, Kallick and Regan, 1991). In order for a school to develop a strong plan for curriculum implementation, it is necessary for the staff to be extensively trained in the focus areas. For this reason, the investigator wanted to determine the level of the staff development opportunities for the teachers regarding MI implementation. The principals' responses to this question are listed in Table 3. From Table 3 through Table 33, respondents could have given more than one response to each category of questions.

TABLE 3
Principals' Responses to Staff Development Opportunities Regarding MI Implementation
n=20

Staff Development Opportunities	Freq.	%
School wide inservice MI teacher training (including having outside consultants give trainings).	19	95%
MI resource library in school for teachers (books, videotapes, and articles).	10	50%
Staff visitation to other MI schools or conferences.	7	35%
Team teacher collaboration and staff meetings.	7	35%
Other	4	20%

In the Other category, two principals reported that their schools had done very little staff development, one principal reported that the teachers took a satellite course on MI from a local university, and another responded that feedback from the principal regarding MI theory was considered staff development.

Every participating school had some formatted curriculum guide that states the goals, concepts, and required knowledge that is to be taught by the teachers to the students. The curriculum guide's main function is to insure teachers will teach the required educational topics as mandated by the state or district. Private schools are an exception to this since there is no public mandate to follow a curriculum guide. The investigator wanted to determine if MI theory aligned to the districts' planned curriculum guide and what responses the principals had regarding this matter. Fifty percent of the principals indicated that MI theory aligned with their district's planned curriculum guide. The remaining half of the participating principals did not respond to this question.

Table 4 illustrates the principals' responses on MI as it relates to the curriculum guide.

TABLE 4

Principals' Responses on MI and the Curriculum Guide
n=20

Responses	Freq.	%
MI theory is the delivery system of the curriculum.	12	60%
Schools must use district or state curriculum guide.	8	40%
School makes its own curriculum.	3	15%

It should be noted that three schools, all private schools, reported that they did not have to adhere to state curriculum guidelines.

Once the theory of multiple intelligences has been integrated into the school and has been operational for a period of time, its strengths and weaknesses can be perceived. Tables 5 presents the principals' responses when questioned by the researcher about the main strengths of MI curriculum implementation.

TABLE 5
Principals' Responses on the Main Strengths of MI Curriculum Implementation
n=20

Responses	Freq.	%
MI helps identify and target the strengths and educational needs of the student.	15	75%
MI enhances the delivery of the curriculum and gives validity to professionalizing teachers and to good teaching practices.	10	50%
MI benefits students by increasing self-esteem, leadership, and collaboration among each other, and self-awareness about themselves.	4	20%
Other	7	35%

In the Other category, two principals stated that MI works with special populations of students such as ESL and Gifted/Talented. Two other principals reported that MI changes the traditional way intelligence is viewed. Individual principals further stated that MI integrates arts into the curriculum, establishes the philosophical framework to the school, and new brain-based research is compatible with MI.

Tables 6 presents the principals' responses when questioned by the researcher about the weaknesses of MI curriculum implementation.

TABLE 6
Principals' Responses on the Weaknesses of MI Curriculum Implementation
n=20

Responses	Freq.	%
MI takes more time to implement, requires a higher level of creativity and a commitment to "buy into" for teachers.	11	55%
Teachers treat MI too superficially and literally.	9	45%
There are no weaknesses.	4	20%
Other	7	35%

In the Other category, four principals reported that there was difficulty in educating the overall community and parents. Three principals stated that better teacher resources were needed for training in MI theory.

After a new educational framework such as the theory of multiple intelligences is implemented by a school for a period of time, principals and administrative staff can look in retrospect at what makes it successful. Learning what makes a new curricular program successful is important to educators when they embark on any future educational endeavors. For this reason, the researcher asked the principals the question, "If a school was going to implement this theory, knowing what you know today, what are the

ingredients for successful implementation?" The results of their responses are listed in Table 7.

TABLE 7
Principals' Responses Regarding Necessary Ingredients for Successful MI Implementation
n=20

Responses	Freq.	%
Staff collaboration, teacher self-reflection on how MI really works, and necessary commitment from entire staff.	19	95%
Must have ongoing teacher training and staff development on MI.	10	50%
Have appropriate funding for school resources and facilities.	5	25%
Other	10	50%

In the Other category, four principals reported that the school needed to have parent involvement and education on MI. Extra planning time for teachers was the response of two principals. Another principal suggested that a minimum of one year was necessary to fully implement MI theory. Yet another principal stated that the assessment system needed to be in place to reflect MI. One respondent reported that the school mission statement needed to reflect MI goals.

Findings of Curriculum Implementation and Teacher Collaboration: Teachers' Responses

After compiling the information from the principal interviews, the researcher

examined the teachers' responses regarding MI curriculum implementation in their classrooms and throughout their schools. In order to gain insight into a teacher's role in MI curriculum implementation, the researcher asked the following question on the teacher survey: "What role have the teachers in your school played in developing a program centered around MI theory?" The results of the responses are presented in Table 8.

TABLE 8
Teachers' Responses on Their Role in Implementing MI Curriculum
 n=18

Responses	Freq.	%
Staff collaborative planning sessions on MI.	12	67%
Teachers received inservice training regarding MI theory.	6	33%
Teachers develop own lessons and units based on MI theory.	4	22%
Other	1	5%

In the Other category, one teacher reported that MI implementation was in place when the teacher came to the school.

In order for teachers to remain current with research in the areas of curriculum and instructional pedagogy, it is necessary for them to receive continual training and development on topics and spend time discussing this new information with their

colleagues (Bradley et al., 1991). From this perspective, the researcher sought to discover what types of development teachers receive to prepare them to facilitate MI in their classrooms. The following question was asked on the teacher questionnaire: “What type of ongoing planning and/or teacher development do you receive to coordinate your MI ideas regarding curriculum with other teachers? The teacher responses are presented in Table 9.

TABLE 9

Teachers' Responses Regarding Training, Development and Collaboration of MI Curriculum Implementation Ideas
n=18

Responses	Freq.	%
Weekly and monthly teacher collaborative planning meetings.	10	55%
School workshops and inservice days regarding MI.	9	50%
Grade level team planning sessions.	3	16%
Other	3	16%

In the Other category, three teachers reported that their school did not schedule time for planning MI curriculum implementation.

Teachers often use a curriculum guide to cover the essential educational topics and skills that are required by their school district (not applicable to private schools).

The researcher wanted to understand if the teachers feel that the MI-centered curriculum addressed their district's planned curricular topics. Eleven teachers responded that MI implementation did address the district's planned curriculum guide and three felt that it did not. Four teachers did not respond to this question.

Teachers who employ MI theory as their framework for delivering the curriculum use the different intelligences so students may approach the subject matter in a multi-faceted manner. After teachers have incorporated the eight intelligences into their lesson plans, they are able to observe students interact and learn through the different modalities (Campbell, 1997). The researcher wanted to determine if the teachers perceived that any of the intelligences affected learning more than others. The intelligences that the teachers felt had the biggest impact on learning are presented in Table 10.

TABLE 10

Teachers' Responses Regarding the Most Influential Intelligences

n=18

Intelligences	Freq.	%
Bodily-Kinesthetic intelligence	5	28%
Musical intelligence	4	22%
Personal intelligences (interpersonal and intrapersonal)	4	22%
Logical-mathematical intelligence	4	22%
Spatial intelligence	4	22%
Linguistic intelligence	3	17%
All intelligences	2	11%
Other	3	17%

In the Other category, one respondent stated this question was not applicable while two other teachers did not respond.

Findings of Instructional Methodologies: Principals' Responses

The theory of multiple intelligences is transformed by teachers into practical applications for classroom use through specific instructional methodologies. When new teachers are hired into a school, they may be asked to become familiar with a particular approach to instruction subscribed the school follows. To this end, the researcher wanted to investigate the schools' guidelines for new teachers with regard to MI in their classrooms. The principals' responses for implementing MI in the classrooms for new teachers are listed in Table 11.

TABLE 11

Principal Responses Regarding MI Implementation Guidelines for New Teachers

n=18

Responses	Freq.	%
Offers training programs and planning sessions for new teachers on specific instructional methods.	11	61%
New teacher is teamed with mentor teacher.	9	50%
New teachers hired have to have prior background information on MI	5	28%
Other	6	33%

In the Other category, two teachers reported they are told to tap into intelligences every

day or at least weekly. Two teachers reported that there is a written handbook for instructional methods. Two additional respondents stated their school had no formal guidelines.

How teachers apply the theory of multiple intelligences in lessons may vary from classroom to classroom. To determine what instructional methods are employed most by the teachers, the investigator asked them to review a pre-determined list of instructional methods and select which ones they utilized in their classrooms. Their responses regarding these instructional methods are reflected in Table 12.

TABLE 12

Teachers' Choice of Instructional Methods Employed in MI Classroom
n=18

Responses	Freq.	%
Self-selected student projects	17	94%
Apprenticeships	2	11%
MI learning stations	11	61%
Workbooks	5	28%
Computer assisted instruction	12	67%
Other	9	50%

In the Other category a variety of instructional methods were described. These include theatre and plays, mini courses covering a two-day, two-hour activity of choice, hands-on activities, language experience stories and journal writing, thematic teaching, the use

of "arts" (music, dance, and art), and cooperative group learning.

There are many instructional strategies that teachers use to incorporate each of the intelligences into their classrooms (Lazear, 1991). To gain a better understanding of how teachers employ different instructional approaches, the researcher asked the teachers to list two successful instructional strategies that they have used for each of the eight intelligences. The following section presents the instructional approaches that the teachers listed in the questionnaire.

Spatial intelligence addresses the ability to comprehend spatial information in the transformation of mental images. This intelligence involves an acute perception of color, line, form and space (Armstrong, 1994). Table 13 illustrates instructional strategies teachers used for spatial intelligence.

TABLE 13

Teacher Instructional Strategies for Spatial Intelligence

n=18

Strategy	Freq.	%
Doing projects via making models of things.	9	50%
Drawing pictures to help describe something.	8	44%
Using or creating graphic organizers (Venn diagrams, flow charts, mind maps, color coding notes).	7	38%
Other	6	33%

In the Other category, three teachers did not respond. Individual teachers listed having students visualize while the teacher reads, comparing and contrasting various artworks, and using vivid descriptions and strong verbs to describe concepts, as instructional strategies for spatial intelligence.

Linguistic intelligence is the capacity to think in words and to use language to express and appreciate complex meanings (Campbell et al., 1992). Table 14 illustrates instructional strategies teachers used for linguistic intelligence.

TABLE 14

Teacher Instructional Strategies for Linguistic Intelligence

n=18

Strategy	Freq.	%
Use of various writing tasks in content areas.	9	50%
Reading a story about a topic.	6	33%
Use of several word games or language arts exercises (Spill N Spell jars, crossword puzzles, rhymes or mnemonic devices, word fights)	6	33%
Students write, produce, and perform a content topic.	5	28%
Other	5	28%

In the Other category, two teachers did not respond. Three additional individual strategies included book reports, role playing and teacher modeling of actual writing forms.

Bodily-kinesthetic intelligence is the ability to use the body to express emotion, manipulate objects with deftness, play games or sports, and create a new product (Lazear, 1991). Table 15 illustrates teacher instructional strategies for bodily-kinesthetic intelligence.

TABLE 15

Teachers' Instructional Strategies for Bodily-Kinesthetic Intelligence
n=18

Strategy	Freq.	%
Movement of body or use of dramatic play to demonstrate a concept	16	89%
Experimentation and model making using a variety of materials	4	22%
Use of manipulatives in math and science	2	11%
No response	2	11%

Musical intelligence is the "ability to perceive, discriminate, transform and express musical forms" (Armstrong, 1994, p. 2). Table 16 illustrates teacher instructional strategies for musical intelligence.

TABLE 16

Teachers' Instructional Strategies for Musical Intelligence
n=18

Strategy	Freq.	%
Student or teacher created songs, chants, and musical rhythms about a content topic.	13	72%
Use or discussion of musical instruments in a lesson to explain a topic.	4	22%
Use of music to depict periods in history or a specific topic.	4	22%
Other	5	28%

In the Other category, two teachers did not respond. One teacher used the use of musical notations to explain fractions, another used student ability to translate a poetry genre into musical form, and one teacher reported the use of an evaluation checklist of the task.

Interpersonal intelligence is described as the ability to focus on the perception and distinction of other people's feelings, moods, intentions, and motivations (Gardner, 1983). Table 17 illustrates teacher instructional strategies for interpersonal intelligence.

TABLE 17

Teachers' Instructional Strategies for Interpersonal Intelligence
n=18

Strategy	Freq.	%
Students work in cooperative learning groups in all content areas.	15	83%
Students work with a partner on assigned tasks.	4	22%
Team building activities (group setting norms or rules, using a tape recorder among each other, and taking turns).	3	17%
Other	6	33%

In the Other category, two teachers did not respond. Four Individual responses included student reading of biographies that relate to each other, role playing a character in a book, planning and performing a newscast on an event in history, and students researching the concept of partnership.

Logical-mathematical intelligence is the ability to incorporate the capacity to use numbers and reasoning skills effectively (Gardner, 1983). Table 18 illustrates teacher instructional strategies for logical-mathematical intelligence.

TABLE 18
Teachers' Instructional Strategies for Logical-
Mathematical Intelligence
n=18

Strategy	Freq.	%
Use of problem solving exercises and math games.	12	67%
Use of graphic organizers to explain something (bar graphs, time lines, tallying)	7	39%
Hands on lessons that relate to students' lives, using logical-mathematical thinking (i.e. develop a budget and purchase food for a trip, make cookies using the directions for measurements, construct projects)	5	28%
No response	2	11%

Intrapersonal intelligence is the ability to perceive an accurate model of oneself through one's awareness of his or her moods, strengths and limitations, temperament, and self-understanding (Gardner, 1983). Table 19 illustrates teacher instructional strategies for intrapersonal intelligence.

TABLE 19

Teachers' Instructional Strategies for Intrapersonal Intelligence
n=18

Strategy	Freq.	%
Students write personal reflection essays.	9	50%
Students keep a journal or diary.	6	33%
Students illustrate or write something that is meaningful to them.	5	28%
Students work alone to study.	3	17%
Other	7	39%

In the Other category, two teachers did not respond. Individual responses included student use of dramatic play to act out other people, the individual use of computers, listening to classical music in the background while they work, interviewing someone, and completing self-checking worksheets.

Naturalistic intelligence is the ability to recognize and classify plants, minerals, and animals (Gardner, 1995). Table 20 illustrates teacher instructional strategies for naturalistic intelligence.

TABLE 20

Teachers' Instructional Strategies for Naturalistic Intelligence

n=18

Strategy	Freq.	%
Field trips or nature walks outside the classroom.	7	39%
Student projects involving a nature theme.	4	22%
Students observe objects from nature to compare and contrast.	2	11%
Other	13	72%

Four teachers reported having no experience implementing this intelligence. An additional four teachers did not respond to this question. Individual responses to this question including having students read literature that reflects appreciation of natural resources, class discussions on environmental issues in current events, writing a reflection in a journal on a solo night hike, learning the fox walk, and listening to sounds of nature as background while writing reports on the nature topic that the sounds are depicting.

Once the theory of multiple intelligences has been implemented in classrooms as an integral framework for a substantial period of time, teachers can evaluate what has worked in their classrooms. Learning from others who have already integrated the theory successfully in their lesson plans can be a powerful tool for growth. On the

teacher questionnaire, the researcher asked the question, "What advice would you give to a teacher who is planning to incorporate MI in his/her classroom?" The teachers' responses to this question are presented in Table 21.

TABLE 21

Teachers' Advice on Instructional Strategies and Successful MI Implementation
n=18

Advice	Freq.	%
Look for ways you may already use MI and then slowly expand upon it.	11	61%
Use the different intelligences appropriately when they seem to fit the curriculum or lesson plan.	6	33%
Create awareness of MI and the different intelligences through projects and student reflective assignments.	4	22%
Collaborate with other teachers and have fun with it.	3	17%
Other	7	39%

In the Other category, five individual responses included the need to practice, to use MI to increase student self-esteem, to assess students according to their strengths, to give up control, to become knowledgeable first, and to just do it. Two teachers did not respond.

Findings of Assessment Approaches: Principals' Responses

Schools that have applied the theory of multiple intelligences are challenged to find ways that adequately demonstrate a student's understanding of learned concepts (Gardner & Hatch, 1989). Therefore, the investigator asked the principals, "What type of assessment approaches does your school employ?" Table 22 lists the principals' responses regarding these assessment approaches.

TABLE 22

Principals' Responses Regarding Assessment Approaches n=20

Types of Assessment Approaches	Freq.	%
Authentic based assessment (checklist, projects, rubrics, and teacher-made assessment tests).	18	90%
Standardized assessment tests.	14	70%
Traditional (letter) report cards.	9	45%
Portfolios and anecdotal records.	7	35%
Non-traditional report cards (progress reports, narratives).	6	30%
Other.	6	30%

In the Other category, four principals utilized parent conferences as an assessment approach. Two other responses included self-reflection among students and thinking maps.

One of the assessment approaches that many schools have employed is the use of

the portfolio. This type of assessment requires students to collect and reflect on examples of their work, creating opportunities for students to make connections between prior knowledge and new learning (Farr & Tone, 1994). The researcher asked both the principals and the teachers the question, “If your school utilizes portfolio assessment, how has it worked with MI implementation?” Table 23 reports the analysis of portfolio assessment among the surveyed principals.

Table 23

Principal Responses Regarding Portfolio Assessment
n=20

Responses	Freq.	%
School utilizes some form of portfolio assessment with MI.	16	80%
School partially uses portfolio assessment.	3	15%
School does not use portfolio assessment.	1	5%
School uses video portfolios.	2	10%
School uses linguistic (writing) portfolios.	6	30%
School uses math portfolios.	3	15%
School uses district/state mandated portfolios.	3	15%

In this era of mandated state assessments, many schools are moving toward curricula and instructional practices that align with their state’s standardized tests. The researcher wanted to investigate whether the MI based curriculum met the standards that are assessed by state evaluations. Therefore, the researcher asked the principals the following question, “Does your school district/state have various grade level assessment

tests? If so, how will MI based curriculum meet those standards being assessed?" Table 24 presents the results of the principals' responses to this question.

TABLE 24

Principals' Responses to MI-Based Curriculum Aligning
With District/State Assessment Tests
n=20

Interview Question	Frequency		%
Does your school district/state have various grade level assessments?	Yes	18	90%
	No	2	10%
If so, does the MI based curriculum meet those standards being assessed?	Yes	17	85%
	Did not answer	3	15%

Findings of Assessment Approaches: Teachers' Responses

Teachers' responses to the question related to assessment approaches and overwhelmingly reported that portfolios reflected different intelligences. Table 25 illustrates the teacher responses regarding portfolio assessment.

TABLE 25

Teachers' Responses Regarding Portfolio Assessment

n=18

Responses	Freq.	%
Paper portfolios include projects and quality work samples that reflect the different intelligences.	13	72%
Video portfolios are used to show collections of work.	5	28%
School only uses portfolio for writing samples.	4	22%
Did not answer or not applicable	4	22%

There are many different assessment procedures that teachers use to evaluate student learning through the lens of the eight intelligences. To gain a better understanding of how teachers assess learning through each of the individual intelligences, the researcher asked the teachers to list two successful assessment approaches that they use for each of the eight intelligences. The following tables (26-33) present the assessment approaches that teachers listed in the questionnaire.

TABLE 26

Teachers' Assessment Approaches for Spatial Intelligence
n=18

Assessment Approach	Freq.	%
Teacher observation and anecdotal record of task.	8	44%
Class discussion and sharing of recently finished projects and learned tasks.	5	28%
Student assessment of task (either self or group).	5	28%
Other	7	39%

In the category Other, three teachers did not respond. Two teachers approached this intelligence by having students design three-dimensional models to explain the topic, and two individual responses included use of a rubric for evaluation and having the students write a portfolio entry.

TABLE 27

Teachers' Assessment Approaches for Linguistic Intelligence
n=18

Assessment Approach	Freq.	%
Student self-assessment through writing of learned material in journal entries or writing assignments.	6	33%
Teacher observation.	5	28%
Rubrics used to assess writing portfolios.	4	22%
Standardized assessments.	3	17%
Other	7	39%

In the category Other, individual responses included peer coaching and editing, student projects, word puzzles to assess knowledge of words, audio assessment and video assessment. Two teachers did not respond.

TABLE 28

Teacher Assessment Approaches for Bodily-Kinesthetic Intelligence
n=18

Assessment Approach	Freq.	%
Teacher observation of student participation.	8	45%
Students acting out and role-playing answers to show the knowledge learned.	5	28%
Paper/pencil tests or computer assisted tests.	3	17%
Other	6	33%

In the category Other, one teacher used anecdotal records, two teachers had students explain their projects to other students, one teacher used compilation of stories in a class book, and two teachers did not respond.

TABLE 29

Teacher Assessment Approaches for Musical Intelligence
n=18

Assessment Approach	Freq.	%
Teacher observation of learned task and student involvement.	6	33%
Students create a song to explain what they learned.	5	28%
Paper/pencil assessment tests.	2	11%
Other	5	28%

In the category Other, individual responses included the use of musical notations to explain fractions, students' translating a poetry gene into musical form, and teacher evaluation checklists of tasks. Two teachers did not respond.

TABLE 30

Teacher Assessment Approaches for Interpersonal Intelligence
n=18

Assessment Approach	Freq.	%
How group developed and finished projects or reports.	7	39%
Teacher observation and anecdotal records on who works well with one another and who shows responsibility.	6	33%
Group tests and ratings within group.	5	28%
Other	6	33%

In the category Other, two teachers did not respond. Individual responses included having partners check each other's work, students completing self-reflection sheets, edited stories, and retesting to determine improvement.

TABLE 31

Teacher Assessment Approaches for Logical-
Mathematical Intelligence
n=18

Assessment Approach	Freq.	%
Teacher observation of skills and completion of tasks.	9	50%
Written and/or oral student expressions of logical reasoning to explain the "why" of things.	9	50%
Rubrics and tests to assess student logical-mathematical skills.	4	22%
Other	4	22%

In the category Other, two teachers did not respond. One teacher indicated the use of anecdotal records and another stated that students trade papers to assess each other's work.

TABLE 32

Teacher Assessment Approaches for Intrapersonal Intelligence
n=18

Assessment Approach	Freq.	%
Teacher monitoring of student writing in logs, journals, and essays to assess depth of thought on topics.	7	39%
Student self-assessment reflecting upon their goals and activities.	7	39%
Teacher observation of student work completed.	5	28%
Other	6	33%

In the category Other, two teachers indicated the use of a rubric for grading, one used anecdotal records, and one tested students with questions involving feelings. Two teachers did not respond.

TABLE 33

Teacher Assessment Approaches for Naturalistic Intelligence

n=18

Assessment Approach	Freq.	%
Teacher observation of student awareness of learned material.	8	44%
Student presentation of project to class with a rubric to score it.	4	22%
Student reflection upon nature trips through writing or illustrations.	3	17%
Other	8	44%

In the category Other, four teachers stated they had no experience implementing this intelligence and four did not respond.

Summary of Elementary MI School Site Visits

To add additional depth to the data resulting from the teacher and principal surveys, three schools were selected from the twenty participating schools and then visited by the researcher. They were chosen for the following reasons: each school represented three separate geographic locations in the United States, they were an accurate representation of the schools that were implementing MI, and there was a willingness on behalf of the school personnel for visitation to their schools. These three schools were selected to represent specific geographic areas of the country: East Coast, Midwest, and the Southwest regions. They were all schools that have been

implementing the theory of multiple intelligences for six years or more and reported that they have earned excellent reputations within their community. Two of the three schools are public schools and one is a private, independent school. The investigator spent two days at each school. During this time, additional interviews with teachers, principals and parents were conducted as well as classroom observation and parent interviews. Classroom observations ranged from kindergarten to fifth grade, depending upon availability of teachers. However, at each school at least one fourth grade class was observed. To maintain the confidentiality of the names of the schools, the three schools in this section will be identified as "A," "B," and "C."

Elementary School A Background Information

This public elementary school is located in a rapidly growing East Coast city. Although the school is located in an upper-middle class suburban neighborhood, it has a service area radius that pulls students from many different regions of the city. Demographic data, made available in the principal interview, indicated the actual school building is 24 years old and sits on a 15-acre campus behind an exclusive suburban housing development. Student population for the academic year 1999-2000 was 511 for grades kindergarten through fifth. The socio-economic status of the students spans a wide range with 33% coming from upper middle income families, 25% from middle income families, and 42% from lower income families who qualified for free and reduced lunch. The ethnic breakdown of the student body is 53% white, 43.8% African-American, 1.2% Hispanic, 1% Pacific Rim, .7 % Native American and .3 % other.

School A has 23 full time teachers, five specialty teachers, and six administrative staff. The specialty areas that have teachers are music, art, library (media center), computer technology, and physical education. Administrative personnel include the principal, assistant principal, psychologist, speech and language pathologist, and two secretaries.

When interviewing the principal to obtain more specific information about the school and her insights regarding MI, the investigator designed an interview guide sheet (see Appendix G). The principal has been in this position for three years and previously had been the assistant principal at this same school for thirteen years. Although she was not the original principal that worked with the teachers when the theory of multiple intelligences was incorporated into the school in 1994, her role as assistant principal enabled her to be involved in the original planning stages. When asked what adjectives she would use to describe the staff, she commented, "The words I would use would be very professional, collegial, and plan together." Her leadership style as a principal is described as "collaborative, delegates job responsibilities, and considers her role as a member of the entire team."

During the site visit, the researcher had the opportunity to observe the principal's management style in action during a bi-monthly coordinator staff meeting. Those attending this meeting were the assistant principal, the MI coordinator, the school psychologist and the literacy coordinator. Not present at this meeting, but part of this team, was the technology coordinator. The purpose of this meeting was to collaborate efforts for planning programs and to provide teacher feedback regarding the programs. Throughout the meeting, the principal listened carefully to each of the staff member's

reports and commented positively. She delegated responsibilities and gave time frames in which they were to be completed. The staff appeared comfortable when they discussed their opinions, and the meeting seemed collegial.

The district office and board of education is supportive of the school and its multiple intelligences curriculum. There are 101,000 students in the district, with 60 elementary schools and seven assistant regional superintendents that report to the superintendent of all the schools. Due to the size of the district, the principal said, “They more or less leave us alone. Although they are pleased that this school has earned the “exemplary” status based on above average state achievement test scores for the two previous years, they really don’t care whether it’s the MI curriculum or not as long as the test scores are up.”

School A is clearly defined as a MI school in its mission statement. Their mission statement includes the following statements:

1. We have adapted the state curriculum to provide several entry points for learners.
2. Our climate released the broadcast lecture format of earlier teaching strategies and embraces both interpersonal and intrapersonal experiences.
3. The faculty, student body, and parents recognize and recruit community mentors to guide learning.
4. We provide in school and after-school opportunities for students to extend their strength areas/skills/intelligences.
5. Problem solving is stressed throughout the disciplines. Units of study

revolve around open-ended problems that stimulate real world experiences.

Physical setting. The school, built in 1976, was originally designed as an open school with flexible wall space. Although the school was not an open school when visited, the original design was advantageous to the flow of present school programs, such as the multi-age classroom (MAC) program that includes connected and open rooms. The school is white brick, single level, and in the shape of a “U,” with the parking lot in the front of the building and the playgrounds to the side. Upon entering the building, the administrative office is visible and directly to the right. It has two large windows that allow the administrative staff to observe the movements of visitors, students, and teachers. The large windows of this area appeared to the researcher to be reflective of the openness and freedom that the faculty and administrative staff seemed to have between each other. The hallways are carpeted and clean. In the entrance foyer eight banners are visible which depict the multiple intelligences. Above these banners is the school mission statement which states, “Our school...A place where hope begins and dreams come true!” Every month, one team (classes representing each intelligence) is responsible for the main school bulletin board. At the time visited, the current bulletin board reflected the logical-mathematical intelligence. The theme was “Challenge 2000,” which encouraged students and teachers to fill a large jar with 2000 coins that would be donated to the American Red Cross.

The administrative office, the teacher faculty lounge, gym/auditorium, cafeteria,

media center, music room, and flow center are in the front and right side of the building. There are thirty-one classrooms in the building. Kindergarten through third grade classrooms are along the right side of the U- shaped design. The upper school classrooms (fourth through fifth grades) are along the left side of the building. Their library, called the media center, is a large, open vaulted room filled with lots of windows, tables, computers, and books. This room is used for library time, research done on the computers, and faculty meetings.

Unique to this school is the flow center. Mihaly Csikszentmihalyi (1990) originally incorporated the flow room concept at the first MI school in the country, which was located in the Midwest. Based on his book, *The Psychology of Optimal Experience*, this concept of flow allowed students to choose activities that represented their interests. Csikszentmihalyi stated that the optimal experience is a time when a person attained a state of orientation so focused that it amounts to absolute absorption of an activity. At School A, the flow center provided an exploratorium for all of its students, and it is an extension of the practice of the multiple intelligences philosophy. The flow center offers students free choice in their selection of activities, opportunities to use intelligence strengths, and an extension of classroom academic concepts. There is a full time teacher's assistant in the flow center who monitors and records the flow activities of individual students and observes strength intelligences in students, which is then relayed back to the homeroom teacher. Students from grades kindergarten through fourth are scheduled for thirty-minute sessions four times a month. The fifth graders are scheduled once a month for a forty-five minute session. The flow center is the size of a

typical classroom with a large 10' x 30' reading loft that has two levels. On the upper level, students play with building blocks, Duplos, Legos, and other physical manipulatives. There are six computers, each loaded with different software. The software triggers the appropriate academic grade level content when students type in their grade. The only mentions of multiple intelligences in the room are small posters depicting the eight intelligences on large closet doors. This room is also the room where the MI/Gifted and Talented Program coordinator works and holds her classes. There is no labeling of activity centers in the room.

While observing the room during a session, the researcher noted there were science, spatial (art), math, and music centers being utilized by the students. The students came into the room and gravitated to the activity of their choice. It was observed that all of the computers were utilized and many students were at the spatial center doing an art project. Several students opted for the reading loft area to play with the Duplos. Other students chose to play board games. Students chose at least two areas to visit during their stay at the flow center. During the second grade session observed, it appeared that the students interacted well with one another and most stayed with only one activity. On the colorful walls filled with interesting pictures on various topics, was an entire section on the topic of immigration. According to the flow center teacher, the fifth grade was doing a unit on immigration to the United States. This center contained books and articles on this topic that the students could use to do research for their immigration projects. The flow teacher collaborated with the other teachers in the school and she was therefore able to change any part of the activity center

to integrate with the various curriculum units. Other sections of the room contained board games, puzzles, and books (see Appendix H). The students that were observed seemed to enjoy their time at the flow center. In fact, the flow center teacher commented on one student who told her “I feel academically safe when I’m in the flow center.”

School programs. In the hallways and classrooms throughout the school, there were posters entitled, “How We Are Smart,” which depicted the eight different multiple intelligences. There were also posters throughout the school that described what was expected of appropriate student behavior. One example of this was a large poster in one of the hallways that stated the guiding principles for behavior:

“Students and staff at ____ School believe every person should act in a way so teachers can teach and students can learn, because learning is the most important thing in a school. Everyone here works as a team to learn and solve problems in peaceful ways. We believe in honesty about schoolwork and believe students and staff can be trusted and feel safe in our building.”

Another large poster in the main entrance foyer was dedicated to problem solving strategies for students. This poster stated the four problem solving suggestions that included ignoring the problem, talking it over with that person, working out a win-win situation, and putting the dispute on the Class Meeting agenda.

According to the school's mission statement, School A believes that teaching students about appropriate behavior is an important cornerstone in its approach to

addressing personal intelligences (interpersonal and intrapersonal). Several years ago, the school began implementing Positive Discipline, a discipline model based on the work of Dr. Jane Nelson (1996). Through the program of Positive Discipline, students learn essential life skills and attitudes to help them be happy, contributing members of society. The skills that are learned through Nelson's (1996) Positive Discipline approach have been translated by School A to include interpersonal skills, intrapersonal skills, strategic skills and judgment skills. Intrapersonal skills are defined as the ability to understand personal emotions and use that understanding to develop self-discipline and control. Interpersonal skills include the ability to get along with others through listening, communication, cooperation, negotiation, sharing, and empathizing. Strategic skills are defined as the ability to respond to the limits and consequences of every day life with responsibility, adaptability, flexibility, and integrity. The ability to develop wisdom and evaluate situations according to appropriate values are the hallmarks of judgment skills.

The most visible component of Positive Discipline was the class meeting. Class meetings are held in each classroom three to five times per week for about twenty minutes per meeting. (School A mandates a minimum of two meetings per week.) However, teachers have the discretion to use them more times as needed with their students.) During a class meeting, the students gather to give compliments to each other (only compliments relating to behavior), help each other, solve problems that occur in the classroom, and plan events and activities for the group. During the investigator's conversations with the faculty, it was reported that the class meeting took care of 95% of the discipline problems that occurred in the classrooms. Through observations and

interactions with students, it was apparent that the majority of students at School A respected and cooperated with one another, had very good self-discipline, and were able to show empathy towards one another.

The above-stated behavior was also observed during a third grade class meeting. The students and teacher sat around a circle and passed a small ball to one another. Each child had the opportunity to compliment someone on his or her behavior. Examples of the comments heard were, "I really appreciated ____ being nice to me at lunch," and "was helpful during math in helping with my fractions," and further, "Ms. ____ was really funny outside at recess and made me and laugh!" and "I really liked ____ cause she let me play with her on the monkey bars at recess." If students could not think of a compliment, they were allowed to pass. The students elected a class president who ran the class meeting. The class president brought up the topic of how they needed to select one person from the class to represent them at the principal's Excellent Eagles, a monthly luncheon for those students who exhibit excellent behavior and citizenship. The class nominated three students and then put their heads down and voted. The students appeared to be thoughtful in their nominations for the Excellent Eagle. The class president asked if there were any other agenda items to be discussed. The teacher added an announcement about a future class trip. The class meeting ended calmly with students going back to their desks to work on math. The teacher mentioned to me that "I use these meetings four time a week. They really cut down the tattling among the students and most things are worked on between the students before they reach the class meeting. It is a great way to work with one another."

Students moved from class to class quietly, understanding the consequences that children who were noisy interrupt the other children in the classrooms. Teachers encouraged children to be helpful with other children. This belief is manifest throughout the school, and students are told that everyone has different strengths or intelligences and that being “different” is positive. The children are taught from the first day of school that every student is unique and that they should honor the uniqueness in everyone. When asked if discipline problems have decreased with the implementation of MI, the principal and many faculty members concurred that MI has a positive impact on discipline issues throughout the school. One faculty member stated:

“We have very few discipline problems here. Perhaps it is the Positive Discipline philosophy that is inherent in our school, or maybe it’s the MI curriculum that allows our students to enjoy learning and feel good about themselves. Maybe it’s a combination of both...whatever it is, it’s working!”

Another emphasis at School A is on their computer technology program which began in 1995. Presently, there are 168 computers with at least five computers per class (kindergarten through fifth grade), and several of them in the flow and media centers for student use. Computer time is allotted each day for assigned work on keyboarding, math, reading, and word processing. There is a computerized reading incentive program that incorporates over 1,500 books on reading levels from grades one through ten. A student reads a book and then takes a short, comprehensive quiz at any computer in the school. The computer program shows the student his/her score and also displays the missed

questions, the correct answers, and records the student's score. These records are printed monthly for students and parents. Along with the reading incentive programs, the school also has the Josten reading and mathematics programs. These programs teach basic skills and critical thinking and can be individualized and self-paced for students. Students are scheduled for ninety minutes a week on the Josten activities. The teachers found this program to be especially helpful with those children who need additional reinforcement on curricular topics. All of the computers have access to the Internet, and many teachers and students work on projects using the Internet for research. There is a full time technology teacher who interacts with all the teachers and assists them with any problems.

Because of the school's high percentage (34%) of identified "academically gifted" students, the school has a strong Gifted and Talented (G & T) program. There is a full time G&T teacher who was also the MI coordinator. They have a catalyst model of gifted instruction that allows the G&T teacher to go into the classrooms and plan enriching activities with the teachers that can benefit the entire class. Academically talented children also receive enrichment outside of the class weekly as a small group. These students can also choose to become involved in after school enrichment programs, such as "Odyssey of the Mind" and "Problem Solvers."

School A also has several other extracurricular MI programs. One popular program among the students is the "MI Express Club." Children of all ages can try out for this club, which incorporates all of the intelligences and culminates in a school-wide production. This year MI Express put on a stage show for the entire school community

that revolved around the topic of immigration. Additionally, each class rotated the responsibility for an aspect of the morning announcements, which were displayed over a closed circuit television in each classroom. They would perform something that they were learning about and the teacher would announce what the class was doing and what intelligences were used. During one of the morning announcements that was observed, the first grade class composed a song on the topic of transportation that utilized their musical and linguistic intelligences.

Parental involvement in the school. School A has a very active PTA with over 300 volunteers. The PTA sponsors a variety of enrichment programs, including Accelerated Reader, International Cultural Festival, Celebration Book, and the annual Book Fair. The funds raised through PTA fundraising events are used exclusively for special projects that, in the past, have included new playground equipment and computers. Many of the parents “sponsor” low-income students in the school, and they ensure that these children are provided with appropriate clothing and school supplies. Some parents also tutor children after school and on weekends in order to strengthen reading and math skills.

Parents are encouraged to visit the classrooms in School A. There is a mandatory teacher/parent conference in October of every year in order to review each student’s progress and also to address any concerns or question both parties involved may have. Throughout the year, various faculty members facilitate parent and community workshops on topics that ranged from Positive Discipline to enrichment techniques.

Through classroom visitations, teacher conferences, and weekly newsletters, parents are educated on the concept of multiple intelligences. Parents are taught about the eight intelligences and about their child's particular intelligences. One teacher relayed a poignant story to the researcher regarding a child that was in her room:

"I had a new boy who had been transferred to the school. His past scholastic history was filled with many failures. When his mother came to the October conference, she was prepared again to hear how her son was failing. She was shocked to hear that her son had many strengths, especially in spatial and bodily-kinesthetic intelligences. Once I realized how to reach him academically through his strength intelligences, his reading and other skills improved dramatically. His mother began to view her son not as a failure but as a child who could succeed academically."

Comments about parent perceptions of the theory of multiple intelligences were further substantiated through an interview with a parent at this school. The parent interviewed had two children, a daughter who already went through the school and a son who was in the fourth grade. She gave two reasons why parent involvement was high in the school. The first reason was that due to the high socioeconomic level of a good portion of the parents. Many at-home mothers had the time to participate in school activities. Secondly, teachers were appreciative of visits made by parents and of parental participation in the classroom. She felt that MI created a positive school environment and stated: "I love MI. It's right on target. We no longer live in a homogenous society. Students come into the school with different backgrounds and expectations."

MI is the great equalizer ... it can reach children in all ways.”

She gave examples of how her own children have benefited from this type of philosophy. Her son is very strong in math and art, but writing was a challenge for him. She found that his teachers helped to strengthen his linguistic skills through writing about mathematical stories and allowing him to use his spatial intelligence to draw what he comprehended during reading. She felt that her son did not feel that he was a failure in writing, but he did understand that it was an area that needed to be strengthened. This parent also commented that her daughter, who was now in eighth grade, had a real joy of learning and a strong confidence which she felt is related to her prior school experience at School A. Throughout the interview, the researcher observed that this parent used the words “strength” and “gift” many times in describing her family’s experience at this school.

Curriculum implementation and teacher collaboration. School A is required to address a state mandated, district wide curriculum. However, they have the jurisdiction to decide the most appropriate way in which to deliver the instruction. This school has chosen the theory of multiple intelligences as its vehicle to deliver the curriculum. According to the principal, the school does not base its curriculum on school wide themes. They have tried this in the past and discovered that many teachers prefer doing their own grade level thematic units. This school has not mandated any specific approaches as to how each teacher was to employ the multiple intelligences in their instruction. However, because the school has a MI coordinator, teachers are constantly

made aware of new and effective MI oriented ideas that they can utilize when planning instruction. Some teachers choose to incorporate MI through the use of learning centers that relate to each of the eight intelligences. Other teachers prefer self-directed projects that incorporate the intelligences. According to the MI coordinator, “the teachers have bought into the MI philosophy. They see that each individual has their own strengths and the MI framework gives them the ability to address them.”

Collaboration among the teachers regarding curriculum issues occurs through grade level teams, mentoring, and faculty meetings. Each grade level team meets once a week for thirty to forty-five minutes, usually after school. According to the three teachers interviewed, there is not much cross grade level sharing of ideas, except when experienced teachers mentor newer teachers. Every new teacher is assigned to a mentor for one year in order to help the newer teacher become familiar with school curricular expectations and MI implementation. The MI coordinator also meets with the new teachers in order to help them with any MI ideas or issues. According to the principal, there has been a 50% turnover of teachers during the last three years. This turnover was due mainly to teachers who retired or transferred . Once a month, there is a group faculty meeting. At this faculty meeting, curricular issues are discussed. Also once a month, there are MI committee meetings. Each school year every teacher served on a MI committee with one of the intelligences as its focus. There is a chairperson and four teachers assigned to work collaboratively on instructional presentations and on distribution of intelligence teaching or classroom ideas. Each month, the intelligence committees are responsible for completing progress reports, and they also rotate the

responsibility for the main bulletin board display area.

When MI was first implemented throughout the school, there were several inservice days when outside consultants came to the school to train staff members. There was also a delegation of six teachers, the principal, and assistant principal who traveled to observe a well-established MI program in action. According to the principal, they need to revisit this focused training because many new teachers have been hired recently. School A does not have a central resource center for teachers to enrich themselves with MI related books, videos, and articles. The several teachers (both classroom and specialty) that were interviewed by the researcher all commented that they would like to have more time in which to collaborate with each other on ideas concerning the curriculum.

Assessment approaches. School A uses a variety of assessment approaches with which to gauge the academic growth of its students. According to the principal, teachers use anecdotal records in the classroom and keep a file on each student. These anecdotal records help the teacher monitor the students' week-to-week academic progress along with their social development. There are also quarterly writing assessment reports for each student which the teachers completed and turn in to the principal. Because of the strong computer program at the school, each student's reading skills are monitored through the Josten reading program. In this program, students read a passage on the computer and then complete a quiz, which is also given on the computer. After each of the question and answer quizzes, the scores are logged into the computer and students,

teachers, and parents can see graphically how each student is progressing with their literacy skills.

The state in which the school is located requires standardized testing. The students are given a battery of standardized tests, such as the Stanford, in the beginning of the year and again at the end of the school term. The district reviews each school's year-end scores, and these scores are used to rate and compare the schools within the district and also to the national norm. Schools in this district strive to earn an "exemplary" rating within the community. One of the criteria for this honor is to achieve high scores on the standardized tests. School A has earned exemplary status for the last two years. The principal felt that having a MI curriculum has allowed the students to enjoy and retain knowledge, and that may reflect why the children do well on these types of tests.

Beyond anecdotal records and standardized tests, students' academic progress is also recorded through a report card that is completed on a quarterly basis. According to the principal, the MI curriculum is not reflected on the report card. She described the report card as "a traditional one, since most parents want to see quantitative results, such as scores and letter grades representing these scores, to demonstrate how their children are doing." The report cards in kindergarten through second grade use the letters "M" (meets grade level expectations), "P" (progressing toward grade level expectations), and "N" (needs more development; performing below grade level) to represent student academic progress. The categories for which grades are recorded are: literacy (reading and writing), mathematics, social studies, science, physical education, and art. Social

and emotional growth are rated for kindergarten only; and work, study, and social habits are rated for first and second grade. There is also space provided for teacher comments.

The report card for third through fifth grade has a combination of letter grades (A-F) and numbers (one through three). Students earn a “3” if they meet the expectations, a “2” if they sometimes meet the expectations, a “1” if they do not meet the expectations, and “SP” shows that the student has made progress since the last report. For the intermediate grade levels, the areas of social development/conduct and work/study habits and efforts are broken down into more specific categories that are graded by numbers. The curriculum areas of English/language arts (reading), English/language arts (writing), mathematics, social studies, science, and health are given letter grades. As with the lower grade report card, these report cards also have areas for comments.

School A uses portfolios as a means of reflecting student learning. Each main portfolio contains four folders that include samples of student work in linguistics (writing), mathematics, assessments (standardized), and special assignments that the students choose to complete. These portfolios are started in kindergarten and maintained through the fifth grade. At the end of the fifth grade year, the students take these portfolios home to keep. Every April, there is a Portfolio Night where students invite their parents in to school so that they can share their current grade level portfolio with them. These portfolios are not scored. Instead, they are used to reflect a student’s cumulative progress for each year and for their educational stay at this school. When asked why the report cards and portfolios do not reflect the multiple intelligences

curriculum, the principal stated:

“ We use MI as a vehicle to deliver the curriculum. We see it as a method to effectively teach the content and, therefore, this method may not be explicitly visible when viewing our portfolios. Also, the district wanted us to use the traditional report cards so we do not have any choice. We do, however, discuss the different intelligences regarding each student during the mandatory October parent conference. With all of this, we feel we can combine all approaches of assessment.”

Classroom observation 1. During the researcher’s visit to School A, there were opportunities to observe one fourth grade class and one fifth grade class. The researcher devised a class observation sheet to use for all of the site visits that viewed instructional methodology regarding the various intelligences, the physical setting of the classroom, assessment approaches, and curriculum implementation (Appendix E). Classroom observations ranged from 30-45 minutes.

The investigator observed the math period in the fourth grade. The lesson plan objective was for the students to practice their division skills. The teacher divided the classroom into groups of three, with each group having a captain. The teacher selected the captains for their ability to help other children learn. During this exercise, the captain was given a set of specific division problems and a green board to write on. The goal was for each member in the group to do the problems and able to explain how they arrived at the answer. At the end, the captain checked off the problems that each student completed correctly. The researcher observed several intelligences being utilized during

this lesson, including mathematical, linguistic, and interpersonal intelligences. The researcher rated the students' reaction to this lesson as a "3" on a scale of 0-5, where 0 was low reaction and 5 was high reaction. The level of participation was rated a "5" on a scale of 1 to 5, where 1 was low and 5 was high. Assessment approaches that were observed during this math lesson were teacher observation and student self-assessment.

During the researcher's time in this classroom, it was noted that it was an extremely cheerful atmosphere. The walls were decorated with brightly colored posters that express self-motivational messages, such as "Go for it!" and "Think positive!" The theory of multiple intelligences was reflected on posters in the classroom that detailed "How you are smart." There were many examples of student work on the walls and on tables throughout the classroom. This teacher allowed the class to choose a class name and the students chose the name "Lucky Leaping Luminous Leprechauns." There were many examples of leprechauns throughout the room as a result. The interaction between the teacher and the students was very positive. The students appeared comfortable around the teacher and she, in turn, displayed respect and kindness to the students. The teacher used a great deal of humor, and the students appeared to enjoy the bantering and the laughter it generated.

Classroom observation 2. The other class observed was a fifth grade math class. The lesson plan objective was to explore angles and classify triangles. The teacher used an overhead projector to explain the directions to the students. For the first part of the activity, students were divided into pairs and were given geo-boards to make different types of triangles. The researcher observed spatial and interpersonal intelligences being

used during this aspect of the lesson. Prior to explaining the second part of the lesson, the teacher pointed out that the students would be using the following intelligences: logical/mathematical, spatial, and linguistic skills (both verbal and writing). She then proceeded to explain the aspect of the lesson she called the “triangle challenge.” She gave several 5x5 blank squares to each student and told them to design triangles that tessellate (go together without leaving spaces and without overlaps). As a culmination, their designs would all be combined to make a class quilt. On the back of the squares, students were to write the different types of triangles they used to create their design. For this lesson plan, both group and individual work was completed. The researcher scored the student reaction to the lesson a “3,” based on a scale of 0 through 5, with 0 being low reaction and 5 indicating a high reaction. The researcher scored the level of student participation a “5,” based on a scale of 0 to 5 with 1 being low and 5 being high.

As the investigator observed this classroom, it was noted that many posters with positive messages were displayed on the walls. Some examples were “No one is a failure who keeps trying”, “Attitude is a little thing... that makes a big difference,” and “Friends – it’s what’s inside that counts.” There were also posters that depicted the eight different intelligences. There was a positive interaction between the students and the teacher. She was open to their feedback regarding her questions, and her attitude seemed to reflect many of the posters seen around the room. The assessment approaches used with this lesson were teacher observation of the student tasks during the lesson and student self-assessment among the pairs when they were using the geo-boards.

Teacher interviews. The researcher had an opportunity to interview the fourth grade teacher who was observed. She has been teaching for thirty-five years and has been in her present position for the past four years. The investigator developed and utilized a nine-question interview guide, used for all of the site visits while conducting the interview (see Appendix F). The following transcript is a synopsis of this teacher's responses to the questions that are pertinent to the research question of this study:

Researcher: How do you assess students' strength intelligences?

Teacher: I spend the first four weeks of school observing each child. I have a journal I keep for each child and I mark down patterns and areas of strengths. Every night, I make an entry. It takes a long time, but it is worth it!

Researcher: Do you know what your dominant intelligences are? Are they reflective in the development of your lesson plans in the curriculum?

Teacher: My strongest intelligences are linguistic (writing) and music. I'm aware that I need to use my other intelligences, so I really try to stretch myself and use my other intelligences to reflect in my lesson plans. Everyone has dominant intelligences, so I tell my students to remember to try other intelligences that they are not as strong in. The goal is to activate all eight intelligences in the students – and I am not excluded from this either.

Researcher: Describe how you collaborate with the other teachers regarding curriculum issues. Are there grade level teams? Is there cross-grade level sharing?

Teacher: We do have grade level teams. There is not as much grade level sharing, but since I am a mentor teacher, I get to learn from them as much as I hope I give them. The time factor is tough, and it is the sharing that takes time – it is so important.

Researcher: Why do you like using MI in the classroom?

Teacher: It makes it more fun. I was originally interested in right/left brain learning so MI meshed right in with that. MI helps kids learn in different ways.

Researcher: What is your philosophy of teaching? Is MI reflected in your philosophy?

Teacher: Yes, MI is. My philosophy is to find out what the students' strengths are and

then to go with them.

Researcher: What are the drawbacks (if any) to MI in the classroom?

Teacher: I've heard teachers say, "it's MI or the test scores." Some teachers think it is "fluff" but I personally don't.

Researcher: What advice would you give to other teachers just beginning with MI?

Teacher: You've got to buy into the philosophy. Once you do this, then commit to it.

The fifth grade teacher who was observed was unable to be interviewed on the day the researcher visited the school. However, the researcher was able to interview a kindergarten teacher who had been in the teaching profession for four years and had taught kindergarten for the last two of those years. The following is a synopsis of the interview with her:

Researcher: How do you assess student's strength intelligences?

Teacher: When I introduce the different intelligences to the children, I try to find out what each student thinks about how they learn best. I am constantly observing them. I watch such things as which learning center they go to first. I also have a class graph on "How You Are Smart." I have found that girls usually pick "People-Smart – Self" and "People Smart – Art" on the graph while boys generally pick "Body-Smart."

Researcher: Do you know what your dominant intelligences are? Are they reflective in your development of lesson plans in the curriculum?

Teacher: My dominant intelligences are interpersonal and intrapersonal. Perhaps, I do add more self-reflection for students to do in my lesson plans because of that. I also

notice that my students do imitate how I communicate, which is reflective of my interpersonal skills.

Researcher: Describe how you collaborate with other teachers regarding curriculum issues. Are there grade level teams? Is there cross grade level sharing?

Teacher: We have grade level team meetings once a week. Also, I meet with the MI coordinator once a week. The MI coordinator has put together a reference book of various lesson plans teachers have done in the school, and it is available for everyone to use.

Researcher: Why do you like using MI in the classroom?

Teacher: I like the way MI gives kids a feeling that they are special. I also like that the personal intelligences help increase self-esteem. Because we all have different ways of learning, we all have different strengths. Teaching children that differences are OK is great.

Researcher: What is your philosophy of teaching? Is MI reflected in your philosophy of teaching?

Teacher: Children are all different, so we need to teach to each child. MI gives you a framework to work within. It also gives a teacher a more varied picture of a child.

Researcher: What are the drawbacks (if any) to using MI in the classroom?

Teacher: Not everyone in a school does it and for MI to really work, everyone needs to be involved and committed to it.

Researcher: What advice would you give to other teachers just beginning with MI?

Teacher: You really have to learn it. Read books on MI. Believe in it. MI is really the best thing for the kids. It also opens your mind and challenges you.

Elementary School B Background Information

School B is a private, independent school located ninety miles northwest of a major Midwest city. Although the surrounding geographic area was once agricultural, the city in which School B is located has grown rapidly due to the influx of technologically oriented companies. The school was opened thirty-three years ago as the first preschool program in the city and was run by a local convent. When the convent closed, several parents took the initiative to keep the school open. The preschool program expanded to an elementary program in 1985 and, with rising student enrollment and expanded programming activities, the school re-located for the second time to a new space in 1995. For the 1999-2000 academic year, the school had 178 students from preschool to grade eight. The socioeconomic status of students was 75% middle income and 25% upper-middle income. The ethnic breakdown of the student body was 99% Caucasian and 1% African-American. School B has 20 full time classroom teachers, one part-time preschool teacher, five part-time specialty teachers, and four administrative staff members. The specialty area teachers are in the fields of visual arts, drama/dance, physical education, music, and language (Spanish). Administrative personnel include the educational coordinator, business coordinator, bookkeeper, and a receptionist. The educational coordinator's role is to run the day-to-day school programs, which include curriculum development, hiring and supervising teachers, acting as a liaison between the

parents and the teachers, and participating on the school's board of directors. The business coordinator's responsibilities include the development of the budget, marketing, and fundraising activities.

The educational coordinator has been affiliated with this school for nineteen years. She was an active board member for eight years and has spent the past eleven years in her present position. This was her last year in this role as she is planning to leave the school to pursue other interests. When asked how she would characterize her leadership style, she replied, "I'm more comfortable being in the 'trenches.' I like the classroom and enjoy when I get the opportunity to be in it. I would say that I am not too demanding and I encourage open, trusting relationships among my staff." The adjectives that she used to describe her staff were "flexible, committed, and caring."

Since it is private, School B has a non-profit status and is run by a board of directors. There are fifteen board members; twelve parents from the school and three members of the community. Of the fifteen board members, eight sit on the executive committee. The committee meets once a month and makes recommendations to the full board, which also meets once a month. The full board has final approval on all hiring and firing of staff, the acceptance of budgets, and of the design of the philosophical tenor of the school. According to the business coordinator, most of the tuition goes towards teachers' salaries. They are able to keep tuition rates down because they received a very reasonable rent agreement on their building. The school receives additional monies from fundraising projects.

The staff at school B was introduced to the theory of multiple intelligences when many of the teachers attended a lecture given by Howard Gardner at a nearby college. The following year, the teachers in the school read Gardner's books on multiple intelligences and further researched the theory. They made the decision to base their curriculum on his theory since it fit perfectly into their approach to learning. During the 1988-1989 school year, School B was among the first schools in the country to embrace the theory of multiple intelligences.

The school's learning philosophy is that learning is a life-long process and it is possible for each person to achieve their full potential at every stage in life. The learning styles, personal interests, and talents of each individual must be acknowledged, honored, guided, and strengthened. The school believes that learning happens best when individuals are provided with hands-on experiences that encourage observation, questioning, and problem solving. It is believed that when students learn how to learn and gain cooperative decision-making and conflict resolution skills, they are provided with the essential ingredients for future success. School B's mission statement explains that the purpose of the school is to provide an educational experience based on the learning theories of Jean Piaget, John Dewey, and the multiple intelligences theory of Howard Gardner. Their integrated fine arts and academic program puts a major emphasis on active learning in order to think, solve problems, and rationally assess situations for today and throughout life.

Physical setting. Demographic data provided by the principal indicated that the school is situated in a middle-class suburban area. Originally, the building in which the

school is located was a 19,000 square foot supermarket. Next to the school, there is a Title 20 daycare center and a Goodwill center. Upon entering the building, there is a small foyer with the administrative office in the front. The administrative office has large windows and is visible to the whole school. Immediately past the administrative office is the library, which is located in the center of the school. There are two medium sized trees in the library area, which provide for a natural boundary. The visual arts area is directly behind the library and, like the library, is an open space domain. All of the classrooms are on one floor, while the teacher lounge and language rooms are on the second floor. There are fifteen-foot ceilings with large, exposed heating pipes. There is a large banner on the wall near many of the classrooms that states, "Our School is the flight of the future."

Due to the high ceilings and large open spaces, the noise level was relatively high. In fact, the art teacher mentioned to the researcher that, "Since the visual arts area is in the center of the school and has very high ceilings, they get a lot of noise. This can be very distracting." Though sound reverberated from the high ceilings, the entire school was carpeted and this cut down somewhat on the noise level. There are no doors on the classrooms, except for the preschool rooms and the music and gym areas. The school adheres to a multi-age grouping model. Therefore, each classroom is divided into two areas: one area has students who are the youngest within their age grouping and the other has the older chronological age children. This is done so that developmental skills in reading and math can be addressed individually and in small groups. The entire classroom worked collaboratively for science, social studies, and class projects. A tall

bookcase serves as the only dividing partition between the two areas of the room. While sitting on one side of the classroom, the sounds and activities from the other group are clearly audible. When the researcher asked the teachers if this was distracting, many replied, “ In the beginning it was, but now we don’t really focus on it. You get used to it.” Most of the classrooms have tables and chairs on which the students can work. However, in the middle school (ages 10-14), there are individual desks for the students. Because the school did not have a cafeteria, the children eat lunch in their classrooms. However, three times a week, hot lunches can be ordered from local restaurants and delivered to school. It was observed that the students were well dressed in a casual manner and that they were well behaved. The teachers appeared to be very comfortable with the students and there seemed to be a genuine rapport between both the students and the teachers.

Although there are a few computers in each classroom, there is also a main technology center with ten computers. The classroom computers are not connected to the Internet, but all of the computers in the technology center have Internet access. The art teacher spends half of her time teaching art and the other half of her time facilitating the technology center. Many of the school’s computer software programs address critical thinking, which is a major learning component of the school.

Throughout the school there are no signs or posters that describe the various intelligences. When asked why this was so, the educational coordinator explained: “Up until four years ago, we used to have posters in the classrooms about the different intelligences. Then we began to ‘live’ the intelligences so posters were no longer

necessary.” There are plenty of student projects, artwork, and writing essays displayed throughout the school for everyone to view. Even with the unusual open spaces and high ceilings, the school’s physical setting leaves the impression of an active, hands-on environment.

School programs. One of the unique approaches that School B has is their adherence to the multi-age grouping model. They believe that this form of interaction encourages more connections and learning between levels, as well as more flexibility among groups. They call these multi-age groupings “family groups.” This school has been doing multi-age grouping for the last twenty years and each year the family groupings change due to enrollment. For the 1999-2000 academic year, the family groups for the school were the following: 3-5 years old, 5-7 years old, 7-9 years old, 8-11 years old, 10-12 years old, and 12-14 years old. Next year, the five-year-olds will be in their own group, since the educational coordinator has discovered that these children have vast developmental differences between among them and the older group. Each student stays in the same group with the same teachers for two years. The criteria for determining in which family group a child is placed includes cognitive development, overall mathematical and language arts abilities, social compatibility, and chronological age. Teachers at the school like the multi-age family groupings since the children can progress at their own pace academically. Each family grouping has a name affiliated with it. The names of the groups are related to each school year’s overall theme, which was “[the city’s name] Treasures” for the 1999-2000 school year. The related family group names were: Peaches (3-5 year olds), Gardeners (5-7 year olds), Phantoms (7-9

year olds), Seekers (8-11 year olds), Foresters (10-12 year olds), and the Jewels (12-14 year olds). Team teaching occurs in each family group. The educational coordinator noted that the school has had a positive experience with team teaching. Occasionally, there have been some staff changes due to personality clashes but, overall, she found team teaching to be a positive experience for both the students and the teachers.

Another unique program at this school is their “Plan, Do, and Review” approach to classroom work time. This program is based on the High Scope philosophy from the 1960s, which allows students to choose their own activities based on their interests. Beginning in the pre-school program, children explore different educational centers based on Gardner’s eight intelligences. After they choose the activities that they wish to pursue during “work time,” they learn to create written and verbal action plans for the day. The teachers help to facilitate the implementation of the activities that the children choose. At the end of work time, teachers recalled and reviewed the activities with the children to see what tasks have been completed. This approach is used with varying modifications throughout the school, and each student creates a personal action plan. In older age groupings, students plan their weekly activities and time allotments in order to align with the various classroom projects and assignments. The educational coordinator felt that this program instills excellent work habits in students and enables them to learn time management and the necessary steps for successful goal achievement.

Interest groups is another program at the school that is popular and fits into its approach to active learning. Interest groups are selected every three to four weeks as a means of immersing students in the learning process through in-depth investigation of

real-life topics. Students of varying ages choose interest groups based on their preferred areas of study. These interest groups meet twice a week for two hours and many of the groups are based on the eight intelligences. Some examples of past interest groups are: “Stargazing – Treasures in the Sky,” “Hear the Ocean Roar!,” “Leaping Literature,” “A Place for Puppets,” “The Invisible Universe – Exploration Through the Microscope”, and “The Way Things Work”. Many of the interest groups have incorporated field trips as well as projects that students must complete for assessment. These interests groups allow teachers to observe individual student strengths and the different multiple intelligences they use when working and solving problems. The groups also allow the teachers to showcase their own interests and expertise as they act as resources for student learning.

School B has a belief that all children need to participate in every aspect of the school community. It has a school council on which all students are asked to participate sometime during their stay at the school. The students on this council plan the school parties, which occur four times a year. These parties are theme-related and last approximately one and a half hours on school afternoons. There is also a school dance, a candy fundraising event, and a game fair that the students help to plan. Along with these special events, the school provides field trips into the community as a means of gaining an understanding and appreciation of the various aspects of the community and of the opportunities offered to its citizens. Pre-school children go on field trips once a month and the other multi-age groups go two to three times a month. The belief at the school is that “education takes place all over.”

Parental involvement in the school. Parental involvement in School B is prevalent throughout the school, from school activities to actual school board decisions. Parental involvement is considered by the administrative staff and teachers as a critical ingredient in the success of the school and, being of private nature, they are able to infuse this belief throughout the school. Similar to a PTO, School B had a parent organization, called the [Name of School] Connection, which meets once a month. There is also a mentoring program in which parents who have been with the school for awhile are assigned to new families. These partnerships are established to help new families become acquainted with the school and to include them in the school community. Because there are no buses, parents drive the students on all of the field trips. They also write a monthly newsletter. The school encourages parents to help out in the classrooms, and they have an open policy in order to encourage parents to observe their child anytime in the classroom.

According to the educational coordinator, the local public school district is currently involved in a segregation lawsuit and does not have a good scholastic reputation. As a result, many parents in the community opt for private education for their children. A majority of the parents in the community send their children to private, church-related school institutions. School B and one other school are the only non-secular private school choices.

The investigator had the opportunity to interview two separate parents whose children have been attending School B for many years. The first parent interviewed has two twin children (a boy and a girl) who have attended the school since they were five

years old. They are now in the middle school and will attend a local private church related high school next year. She has been a board member and has been very involved in fundraising activities at the school. When asked what she likes about School B, she replied:

“I like that, although my kids are twins, they have always been respected as individuals. The teachers here show respect to the students, so the students learn that themselves and learn to respect themselves and others. I like that there is team teaching, so the kids get different perspectives. The kids are taught that they have different intelligences and the by-product of this school program has been the development of self-worth that my children feel.”

This parent has some concerns that her children will be leaving the secure, nurturing environment of School B, but she feels that the confidence that they have gained will sustain them both academically and socially in their new school.

The second parent interviewed is a woman who has spent a long time examining the various educational options for her child. She first enrolled her child at the school in the pre-school program and her child is currently in the Phantom group (7-9 year olds). She happily reported to the researcher that the school has supported her and her daughter whole-heartedly and that there have never been any instances of negative feedback to her daughter. When asked what she liked about the school, she replied:

“ I like how it has developed my daughter’s self-esteem. The curriculum here addresses the student’s strengths first and that leads to self-esteem and enjoyment of learning. At first, I was concerned that there are no textbooks.

Now I see that she's learning and able to apply her knowledge in real life. When you have a good foundation, you can explore other boundaries."

Since the theory of multiple intelligences is presented in a subtle rather than overt way in this school, the researcher asked both parents about their thoughts on multiple intelligences. The parent whose twin children have been at the school the longest stated:

"MI is a concept that has worked here at this school. I remember when my kids would talk about how they were 'body-smart' or 'music-smart.' Now they just understand that there are all different ways of being 'smart.' It just seems that now they simply accept that there are different ways of understanding things."

The other parent feels that multiple intelligences give the teachers and students different means of understanding how everyone learned. She feels that the school emphasized the interpersonal intelligences well and this led to better social interactions among the students.

Curriculum implementation and teacher collaboration. Since School B is an independent, private school it is not mandated to conform to statewide curriculum decisions. The teachers, administrative staff, and board of directors have full reign to design and implement the curriculum. The content of the curriculum is formed from a great variety of student and teacher interests, community resources, and local and global events. School B's unique curriculum model for education was based on four domains of human development: personal growth, learning modes, cognitive processes and learning tools. Personal growth includes self-esteem, physical and mental health and successful personal interaction. Learning modes encompasses individual strengths and

talents which are used to gather information and carry out daily learning activities.

Cognitive process describes the approach to every learning event with an attitude of creative thinking that encourages the solving of problems and the understanding of relationships. Learning tools for continuous learning emphasize practicing the skills of communication, accurate computation, and basic knowledge acquisition.

Along with these domains of human development, the curriculum at School B is further interwoven with art activities including music, drama, movement, and visual arts. In fact, art is the foundation for learning and interaction that underpins the school's curriculum. This reflects their belief that communication/expression (drawing, speaking, writing, dance, songs, etc.) is an art form. The philosophy of the theory of multiple intelligences in learning is utilized by School B, and they believe that it is a means of delivering this integrated curriculum.

According to the educational coordinator, the curriculum is based on a yearly school wide theme. The staff decides on the theme and purposely chooses one that is multi-dimensional. This current year's school theme was "[the city's name] Treasures." Last year's theme was "The Renaissance." As mentioned before, all of the family grouping names are related to the school-wide theme. Interest groups, which are very prominent in the school curriculum, can be part of the school theme, but they can also be unrelated to it. The application of the multiple intelligences is seen most clearly in the different interest group programs. The students in the interest groups design their culmination projects based on the various multiple intelligences. The theory of multiple intelligences is very much evident throughout the curriculum, although the teachers do

not label the intelligences for the students. Instead of labeling the intelligences, the teachers like to believe that the students are “living” them.

The teachers in School B do not have a school curriculum guide. Textbooks are not used by the students until the middle school. Instead, each teacher develops his or her own classroom curriculum and coordinating lesson plans. The educational coordinator explained: “Everyone here likes creating their own curriculum. With team teaching, combined efforts of ideas and thoughts help with the design of the curricula areas.” Teachers do not engage in much direct instruction, except for the introduction of a new topic. Instead, the emphasis is more on interactive, participatory learning experiences, where children have the opportunity to discover, create, and invent.

The administrative staff and teachers considered teacher collaboration as a critical ingredient necessary to the implementation of the curriculum. Staff meetings with all of the teachers occur twice a month. Additionally, there is one inservice day scheduled per month. During these days, teachers spend half of the time learning about various educational topics, such as literacy programs and new trends in education. The other half of the day is devoted to teacher planning and collaboration. However, even with staff meetings and inservice days, the teachers feel that there is still not sufficient time allotted for the planning of curriculum.

Assessment approaches. According to the educational coordinator, teachers evaluate student growth through classroom observations and authentic assessments which are designed by the teachers to coordinate with their classroom goals and curriculum. These observations and assessments are written down in the form of

anecdotal records. Additionally, there are two parent-teacher conferences each year.

During the fall conference (end of October), parents are asked to observe their child in the classroom prior to meeting with the teacher. This allows for the parents to have first hand knowledge of their child's performance and helps to create a dialogue between the teacher and the parent regarding perceptions of the child, realistic goals for the child, and other pertinent information. There is a second parent conference at the end of the year in order to review the continuum. The school does not have traditional report cards.

Instead, the staff has developed what they call a "Communication Continuum," which they have used for the past two years. They believe that communication skills encompass the language arts as written, read, and spoken language. These skills are incorporated into all aspects of the program at the school. The continuum also includes the areas of reading, writing, oral communication, listening, and research skills.

The continuum consists of a double-sided paper, measuring 12" x 24". The front sheet covers the categories of pre-reading and reading skills, pre-writing and writing fine motor skills, oral communication and listening skills, and writing mechanics and research skills. Under each category are 25-30 items that are checked off as either "developing" or "consistently observed." The second side of the continuum had forty-six items which relate to student social skills. This continuum not only helps parents to understand how their child has progressed over the year, it also acts as a guide to the teacher detailing what was mastered and what needs to be addressed specifically by each student.

Progress reports are sent out to the parents at mid-year. These are narratives organized around the content areas designed by the team and the specialty teachers. The

two conferences (beginning and end of term) and the progress reports are used for both the elementary and middle school. However, the middle school students have a slightly different arrangement regarding the conferences. Instead of traditional conferences, they have committee meetings where the student, parents(s), teacher, and a select fourth person (friend, family member, or another relative) meet together. This committee meets in the fall, mid-year, and at the end of the year to plan goals, set objectives, and establish a plan for the future year for each student.

School B believes in a more authentic assessment approach, as opposed to letter grades and traditional tests. In order to assess what the students have learned, they use projects, debates, writing assignments, and other performance-oriented indicators. In the middle school (11-14 year old family groups), the teacher gives a percentage grade on projects and classroom assignments. Although the school is not mandated to use standardized tests, they have the middle school students take the Iowa Tests of Basic Skills. According to the educational coordinator:

“We only started giving out percentages on assignments and allowing students to take the Iowa Test because when they transferred to local high schools, the schools wanted a quantitative measure of how the student was progressing. By the way, our students consistently score in the seventieth percentile or above on the Iowa test.”

Along with the narratives and conferences, School B also utilizes “processfolios” for each student. These processfolios are a collection of the student’s work in language arts, math, interest groups, and science and they are sent home three times a year. The

student and parent(s) collaboratively decide which pieces of work remain in the folder. At the end of the year, the teacher, parent(s), and students each select samples of what they consider to be exemplary work that should remain in the folder. The processfolio continues with the students throughout their stay at the school.

Class observation 1. The researcher had the opportunity to observe the Seekers (8-11 year olds: third and fourth grade equivalent) during a language arts lesson. The lesson plan objective was to be able to correctly identify the difference between “to”, “too”, and “two” in sentences. The teacher wrote sentences on the board and left blanks for the correct choice. The students took turns completing the sentences with the correct word. The lesson was performed with the entire class. The researcher rated the student reaction as a “4” on a scale of 0 (low reaction) to 5 (high reaction). Student participation was rated a “5” on a scale of 1 to 5, where 1 was low and 5 was high. Linguistic and interpersonal intelligences were observed. Teacher observation was the main assessment tool for this lesson and the teacher observed whether the students wrote the word in each sentence. Additionally, the teacher asked the other students to observe if the student at the chalkboard was correct or not. The investigator observed that the students supported one another by helping each other determine which word correctly fit in each sentence.

There were many colorful posters and various examples of student work displayed throughout the classroom in which this lesson was observed. However, there were no posters denoting the multiple intelligences. As mentioned earlier, team teaching

occurred in all classrooms, usually with one teacher working with students on one end of the room and another teacher working with students on the opposite end. There was no wall dividing the observed classroom and noise from the adjoining portion of the classroom could be heard easily from where the researcher was sitting. However, the students and teacher appeared oblivious to the noise activity at the other end of the classroom. The researcher observed positive student-teacher interaction. They appeared very comfortable with one another as they bantered back and forth.

Classroom observation 2. The second classroom that the researcher observed was the Gardeners (5-7 year olds). The particular students observed were seven years old (the oldest in this family group), and they were working on a math lesson. The lesson plan objective coincided with the one hundredth day of school and asked the students to count one hundred different objects. The teacher broke the class into small groups and had them rotate between different tables that had been set up for the performances of various tasks. At one table, children had to count and group one hundred pennies. Another table had students selecting and pasting different shapes on a posterboard in order to make a mosaic collage that contained one hundred pictures. A third table had various worksheets relating to the number one hundred, and the last table had a variety of math manipulatives that the students used to investigate the number one hundred. The intelligences that were observed during this lesson were logical-mathematical, interpersonal, and spatial. In regard to student reaction to the lesson, the investigator scored it a “5” on a scale of 0 to 5 (with 0 being low reaction and 5 being high reaction). Student participation was scored a “5” on a scale of 1 to 5 (with 1 being

low and 5 being high), since it appeared that everyone was involved in all aspects of the lesson. In order to assess student acquisition of information, the teacher used observation, reviewed the student's worksheets, and had the students participate in self-reflection. After the activities were completed, the teacher gathered all of the students in a circle and had them reflect on which activities were the hardest and easiest for each of them and why. She also had them share their mosaic shape pictures with each other and then discuss which shape each student used most often.

The classroom that was observed was filled with many student projects and the walls were covered with student artwork. It had many windows, which contributed to the bright and cheerful atmosphere. Although the researcher was distracted by the noise coming from the adjoining class, it appeared that the teacher and students being observed were not affected by the noise at all. It seemed as though the teacher had a good relationship with the students. Throughout the lesson, she made comments to the students such as, "I notice how well you are all working together," or she commented about individual student's positive work effort and behavior. The students often smiled back or hugged the teacher after the compliments were given. As noted throughout the rest of the school, this classroom did not have any overt signs depicting the different intelligences. When the researcher asked the teacher about this, she replied: "I use the different intelligences everyday. We used to have posters explaining how we are 'smart,' but not now. As teachers here, we have decided that it was simply walking the walk as opposed to talking the talk!"

Teacher interviews. The researcher was able to interview one of the teachers from the observed classes. The other remaining teacher was unavailable to be interviewed on the day of the site visit. The following synopsis details the investigator's interview with the teacher of the Seekers (8-11 year olds). She has been in the teaching profession for eight years and has been teaching this particular group for the last two years.

Researcher: How do you assess student's strength intelligences?

Teacher: Because we have kids here in this classroom for at least two years, we can gradually gain insight about each child's strengths... and we can watch them develop and grow. I also look at their individual interests and what each student gravitates to, especially in the interest groups.

Researcher: Do you know what your dominant intelligences are? Are they reflective in your development of lesson plans in the curriculum?

Teacher: That's a good question. I do like language arts since my background was in reading. I guess I'm dominant in linguistics. Maybe it does reflect in lesson planning, but that's the beauty of team teaching. My co-teacher's strengths are in logical-mathematical and spatial areas.

Researcher: Describe how you collaborate with other teachers regarding curriculum issues. Are there grade level teams? Is there cross-grade level sharing?

Teacher: As team teachers, we are always talking together about different ways of doing the curriculum. We write all of our own curriculum so discussion between the two of us is critical. My co-teacher is an incredible teacher who has been here for years, and I have learned a lot from her. We have inservice days once a month, so we share ideas regarding curriculum as a collective unit of teachers. Together, we also select the yearly theme and a lot of our curriculum gets based around it.

Researcher: Why do you like using MI in the classroom?

Teacher: I wasn't here, of course, when MI began in this school. However, MI is our philosophical framework for our curriculum and for how we develop it. Our approach here is that we don't preach MI, we practice it instead. I like it because it continually

fosters mastery of skills and it allows children to enjoy learning in all different ways.

Researcher: What is your philosophy of teaching? Is MI reflected in your philosophy of teaching?

Teacher: I believe in mastery of skills, integrated learning, and life-long learning. MI definitely fits into my teaching philosophy.

Researcher: What are the drawbacks (if any) to MI in the classroom?

Teacher: The concern is that you might try to address all the intelligences superficially instead of going in depth with them. You need depth of understanding for life-long learning to occur.

Researcher: What advice would you give to other teachers who are just beginning with MI?

Teacher: Read about it. Believe in it. Don't make it superficial in your lesson plans. Make MI part of the entire genre of your teaching.

Elementary School C Background Information

School C is a public elementary school (kindergarten to fifth grade) that is located in the southwest region of the United States. The city in which the school is located is considered the largest in the state. Although the school has a city zip code, the region in which it is located in is more characteristic of a suburban area with housing developments and strip malls. The school itself is in a residential area and is surrounded by many apartment developments. Years ago, the school's neighborhood had an older, more stable population, but now due to the transient nature of the population, there are many young families living there. The student population for the 1999-2000 academic year was 650. The socioeconomic status of the students had a wide span with 12% of students from upper-middle income families, 20% from middle income families, 22%

from lower-middle income families, and 46% from lower class families that received free and reduced lunch. The ethnic breakdown of the school is 54% Caucasian, 33% Hispanic, 6% Native-American, 4% African-American, 2% Pacific-Rim, and 1% other. School C has thirty-nine full time teachers, two part time aids, eight specialty teachers, and six and a half administrative staff. The specialty areas that have teachers are library, physical education, reading, music, computer technology, and Spanish language arts (teachers mostly engage in art activities while incorporating Spanish because the district did not fund art teachers). Most of the specialty teachers work part time at this school and part time at other schools within the district. The administrative personnel includes one full time principal, one half time assistant principal, one nurse assistant, one guidance counselor, one clerk, and two secretaries.

The principal of School C has been in her position since September 1999, and previously was the assistant principal for a six-month period. The principal prior to her had been with the school since 1989 and was the driving force that brought the theory of multiple intelligences to the school. When asked how she would describe her leadership style, the principal responded:

“ I am democratic and I enjoy participation among the staff regarding ideas and decisions. My style is quite different than the previous principal. She was more autocratic, but very dynamic. Coming in after her has been challenging, but I feel I will bring other things to the school and make my own contributions to the school.”

She further describes her staff as dedicated, highly trained, and people who truly love children. In fact, one of the third grade teachers in the school was honored in 1996 as the state's top teacher and also recognized in 1999 as the top teacher in the school district. The school was further highlighted in a December, 1999 report entitled "Better by Design: Consumer's Guide to Schoolwide Reform" that was released by the Thomas B. Fordham Foundation. This report examined reform efforts at ten schools nationwide and School C was highlighted in the section dealing with the topic of multiple intelligences in schools. This five-page section discussed how several of the teachers in School C have applied the theory of multiple intelligences in their classrooms. The district, teachers, and administrative staff are very proud of being the school chosen to be showcased in this prestigious report. School C was also recognized by their state as a Blue Ribbon school because of their excellence in educational standards, high test scores, and strong, masterful teachers. According to the principal, earning this status is something the school and the district are very proud of, and the school must continue to work hard to maintain this status. The principal further elaborated that this goal is sometimes hard to achieve since "the student population has become more and more transient and many experienced teachers are retiring."

School C's mission statement is "to enhance the love of learning by stimulating curiosity and providing the necessary skills to make learning a lifelong pursuit." It's motto, "A Bridge to the Future," is stated on the cover of the parent handbook and posted throughout the school. In the parent handbook, the school explains the incorporation of MI as the way students at the school learn to identify their own areas of

strength. Opportunities to develop these strengths are provided through activities with hands-on materials and by addressing the eight intelligences during varied classroom instructions. Although School C uses MI as a framework, the teachers also use Costa's (1981) Twelve Intelligent Behaviors as an additional model in their classrooms.

According to the principal, the district office and board of education are supportive of the school and its MI based curriculum as long as the school continues to score high on the state standardized tests. The superintendent rarely visits the school and only meets with the principals in the district on a quarterly basis. Besides School C, there is only one other school in the district that implements MI in its curriculum and, according to the principal, there is no on-going collaboration between these schools.

Physical setting. School C was built thirty years ago and was originally intended as an open school. The building consisted of a brick façade and was designed to give a courtyard feeling. In one building, the administrative office, library, computer technology area, and cafeteria are all connected to each other. This building faces the main street and proudly displays a banner citing the school as a Blue Ribbon school. The classrooms are located in two nearby courtyards that can only be reached from this original building by walking outside along a covered path. Each courtyard has nine classrooms, with five classrooms on one side of the courtyard and four on the opposite side. These two courtyards house the classrooms for grades one, two, three, and some of grade four. Most of the fourth grade and all of the fifth grade classes are held in module units that are located past the courtyards. There are a total of nineteen module classrooms, including those in which Spanish language arts, enrichment, and special

education classes are held. The gymnasium is directly across from one of the courtyards. The restrooms are also included in the courtyard design, but they are separate from the classrooms. The three kindergarten classrooms are located behind one of the classroom courtyards and directly next to the playground area that is used by the entire school. There are no classroom hallways and, therefore, there were no school posters or examples of student work. Instead, each classroom has its own individual décor and it is there that students' projects and work samples are displayed. The layout can be described best as a campus-like setting. Although the building design is somewhat disconnected, it does not detract from the dedication and commitment that the teachers exhibit toward the students.

All classes have library once a week. The library is large and filled with many colorful banners that depict the year's library theme of "[the school's name] Global Express." There was a large three-dimensional cardboard yellow truck in the middle of the library and it had a sign on it that read, "Books can take you anywhere." In accordance with the year's theme, the librarian introduced a new continent to the students every four weeks. Each child received a "passport" that is stamped whenever they read something related to that particular region. There are many books and articles on the country of study which are located in the library near the cardboard truck. Previous library themes have been "The Wizard of Oz," "Dr. Seuss," "The Lion King," "The Circle of Life," and "The Pagemaster."

School programs. Approximately 15% of the students at School C qualify for the Gifted Enrichment program. These students scored 130 or higher on standardized

IQ tests and received the recommendation of their teachers in order to participate in the enrichment program. In grades one through three, students participating in the program are pulled out of their regular classes for one morning and one afternoon each week. Students in grades four and five spend one full day in the class each week. The gifted enrichment teacher utilizes all of the multiple intelligences throughout her program. One of the programs implemented during her class is called the Math Olympiad. During this period, which is held for one hour each week, students complete intensive math exercises and devise strategies for solving complex problems. Additionally, the teacher has the students write plays, which she felt touched upon all of the intelligences. According to this teacher, “ Gifted kids can learn from each other. One can learn to inspire their peers and also to be inspired by others. By using the multiple intelligences, I can draw upon many different avenues in order to address these children’s various strengths.”

Another interesting program at School C is their bilingual art class. Through the combination of languages (Spanish and English) and art, students have the opportunity to become immersed in language and express it in a spatial manner. As a designated bilingual school, students must have thirty minutes to one hour of bilingual instruction each day in order for the school to retain its funding. The previous principal developed this class as a means of incorporating this bilingual time and also to continue art classes after the district excluded them from the budget. According to the current principal, they are able to budget for two art/Spanish teachers for the school since these teachers contribute to the bilingual education of the students. All students participate in this class once a week for a forty-five minute session. During one class, the researcher observed

students as they used mirrors to look at themselves and then drew a portrait of what they saw. They learned symmetry as they drew the eyes, nose, mouth, and ears and the teacher labeled these various parts in Spanish for them. Throughout the class, the teacher spoke in both Spanish and English.

The school's physical education program is called KE (Kinesthetic Education). This program combines both the bodily- kinesthetic and the personal intelligences emphasized at the school. Around the large, well-equipped gymnasium signs are posted that have motivating words and their meanings, such as competitive greatness, confidence, cooperation, intention, and concentration. When the investigator observed the KE class, the teacher detailed how to play a particular ball game to the students. After the students started to play, the teacher paused the game in order to discuss how they, as a group, could play better if they worked together as a team. The instruction emphasized both physical endurance and teamwork and cooperation. The KE teacher awards a Cooperation-Concentration-Confidence award each month to the classes that excel in those areas. She believes strongly in MI and purposely incorporates all of the multiple intelligences in her class. She mentioned to the researcher that, "I think MI is great. This approach is one that children learn in many ways. Nobody's going to get lost when schools incorporate MI."

School C has a computer-assisted instruction program. The computer technology classroom has twenty-five computers for instructional use and each class has one, fifty minute computer session each week. In kindergarten, students are taught basic computer skills and by fifth grade students conduct Internet research and utilize word

processing skills. Students have their own file and continue to work at their own level throughout the grades. According to the teacher, most classrooms in the school have two or three additional computers. The technology teacher collaborates with regular classroom teachers on selecting appropriate software with which to enhance their lesson plans.

Parental involvement in the school. School C has an active Parent-Teacher Association (PTA) which sponsors fundraisers and parent volunteer groups in the classrooms. Parent volunteers assist in the library, office area, computer room, and in the regular classrooms. Both the teachers and the administrative staff feel that parent volunteerism is an important ingredient in enhancing the students' education. The fundraisers, such as the Book Fair, Bake Sale, and the school's Cultural Fair, have raised money for classroom equipment and materials and have supported various school functions. Another parent group called Moms in Touch acts as a support group for troubled families in the school and uses prayer as a means of reaching these families. They also volunteer their time working in the school. The PTA writes a monthly newsletter that is sent to all families to inform parents of upcoming events and other pertinent school information. According to the principal,

“ Our school PTA is very powerful. There is high parent involvement here and their help in the school has been incredible. Sometimes when one parent asks another parent to do something, it goes a lot further than if I or a teacher asks them. As a principal, I try to cultivate parent involvement as much as possible.”

The investigator also met with a parent who discussed her impressions of her involvement in the school. The parent who was interviewed has a daughter in second grade and was visiting her classroom to watch her daughter present a project that she and her family did concerning space. The parent mentioned to the researcher that she feels privileged her daughter attends this school. She explained, “At this school, my daughter has fun learning. The more fun they make it, the more I find her remembering the information. All of the teachers here are caring and are interested in working with the students’ strengths.” As a parent, she was involved in the PTA and feels that parental involvement is critical in a school. To further explain this, she remarked,

“I work part time, but I make it my responsibility to get to know the school my child goes to. I know the principal on a first name basis and feel I could talk to her about any issue if necessary. You also need to have a good rapport with the teachers. The more you know about what is going on with your child’s schooling, the more you can help them achieve.”

Curriculum implementation and teacher collaboration. School C’s district has a curriculum guide specifying areas which need to be covered in each grade. However, how these curricular areas are taught is determined by each individual school. The district also determines certain grade level themes, such as “The Wondrous Sea” and “Space: The Next Odyssey.” According to the principal, each class uses these themes and modifies them within their particular grade level. School C uses the theory of multiple intelligences along with Costa’s (1981) twelve intelligent behaviors as the framework for developing instructional delivery methods. The principal stated that, “MI is the delivery

system of the curriculum.” Many of the teachers who were involved when MI was first incorporated in the school were still tailoring their lesson plans to address the various intelligences. However, 10% of the teachers were hired over the past three years and, although they are familiar with the theory, they may not have incorporated MI as much as the more experienced teachers in the school. In order to help new teachers get acclimated to the school’s philosophy and instructional methodologies, the school established a mentoring program in which they paired experienced teachers with new teachers. New teachers are given a packet of information called “The Multiple Intelligences Toolbox.” This thirty page informational packet is required reading and is to be discussed with their paired mentor.

The principal admitted that there needed to be more inservice training on multiple intelligences, especially with newer teachers. In fact, although the principal believed in MI in the classrooms and its positive effects on the students, she herself feels that she would benefit from training that refreshed her knowledge about MI implementation. Apparently, when the previous principal left, she took all of the MI resource books along with her. Subsequently, there is no longer a MI resource area with books and articles to which teachers can refer. One of the principal’s goals is to rebuild this area as a resource center for everyone in the school to use.

Throughout the school, there are no overt signs that School C is a MI school. A few classes have posters that detail the eight intelligences, but these classrooms are in the minority. When asked about this, some of the teachers reported that MI was so much a part of how they teach that they did not feel that posters and other means of portraying

their school as a MI school are necessary. As one teacher explained: “It is more important to be actualizing MI into our everyday at school. How you incorporate it and how the students are learning is the most important result.”

According to the principal, there is grade level collaboration regarding instruction. Teachers meet with their grade level teams at least twice a month and discuss curricular issues. Also, there is a schoolwide teacher meeting held once a month in which teachers have planning time during lunch. However, the principal stated that many teachers have expressed concerns that they don’t have enough time to plan for instruction. On this topic, the principal reiterated:

“Enough time for curricular planning is an age old issue for most teachers.

There doesn’t ever seem to be enough time for this. With less time available, there is less time for collaboration among the teachers. We definitely need more collaboration among our teachers, and I have to figure out a way to make this happen.”

Assessment approaches. At School C, classroom teachers are given the power to decide how to assess their students on a day-to-day basis. Some teachers keep detailed anecdotal records on each student that include observations of how the students demonstrated knowledge of a given topic during the lesson. Other teachers have devised their own pencil and paper tests in order to assess the student’s ability and understanding of new information. Still other teachers prefer to use projects to assess how the students are able to apply what they have learned in an organized and thoughtful manner. Some

teachers use a combination of all of the methods mentioned, including anecdotal records, teacher observations, projects, and pencil and paper tests.

The state in which School C is located has mandated standardized tests in order to monitor students' level of acquired knowledge. The state requires the school to administer the Terra Nova Test, a second grade reading inventory, and a fourth grade writing assessment. As mentioned previously, School C has scored consistently above the norm with these standardized tests and is often in the 70% range. In order to maintain its Blue Ribbon status, test scores must be kept above the norm.

The district mandates the type of report card that School C sends home to the parents. Report cards are completed three times a year, and parent conferences are held twice a year, so teachers and parents can go over the results of the report cards and discuss any other pertinent information regarding the academic and social development of the child. The report card for kindergarten through second grade addresses the following curricular and social development areas: language arts skills (listening, speaking, reading, and writing), mathematics, social studies, science, health education, physical education, art, music, computer education, elementary Spanish program, bilingual education, and personal responsibilities (work habits and behavior). These areas are graded with a "+" to denote excellent progress with regard to individual effort and achievement, a "check" to denote satisfactory progress with regard to individual effort and achievement, a "^" to demonstrate improvement but not yet up to expected progress, and "—" to denote that more progress in individual effort and achievement is needed. There is also a small comment section for the teacher to elaborate further on

any section necessary. The report cards for third through fifth grade are similar, but instead of +, check, --, and ^, they are graded with A (excellent), B (good), C (satisfactory), D (low), and U (unsatisfactory). According to the principal, the district is planing to redesign the language arts area of the kindergarten through second grade report card in order to include scoring levels of “emergent,” “early,” “competent,” and “fluent” in the areas of listening, speaking, reading, and writing.

At School C, portfolio assessments are not mandated; however, approximately half of the teachers keep samples of student’s work for their own reference and to show to parents during conferences. According to the principal, there has been some discussion in the district about mandating student portfolios, but nothing formal has emerged from these talks.

Classroom observation 1. During the investigator’s visit to School C, there were various opportunities to observe classrooms. One of the classrooms observed was a third grade class. The observation took place during a science lesson where the lesson plan objective was to learn about magnets. The instructional methodology used during the lesson was learning centers with activities concerning magnets for each student to complete. The teacher broke the class into groups of four that rotated through the various centers. The students were required to write down the results of their activities at each center on a paper that was given to them by the teacher. Throughout the lesson, there were many hands-on activities that encouraged experimentation. At one center, students needed to experiment with various materials to determine which were attracted to the magnet. The researcher measured the student’s reaction to the lesson based on a

scale of 0 (low) to 5 (high) and concluded that this class was a “5” because of the high level of reaction. Student participation was rated as a “5,” on a scale of 1 (low) to 5 (high), since it appeared the students were very involved in all of the activities. The investigator observed spatial, bodily-kinesthetic, logical mathematical, and interpersonal intelligences being used throughout the lesson. These intelligences were utilized in the various activities as students drew magnets, made model planes out of paper, attached magnets to measure how far they could fly, performed a dance on the topic of magnets, and cooperated and collaborated with each other in their groups. The assessment approaches used were teacher observation, teacher questions to the students about their findings, and completion of the required worksheet.

The day that the researcher observed this classroom, both the teacher and the students were dressed as aliens as part of the culmination of a unit on space. Later that day, the class participated in an “alien feast” prepared by the parents, which included Venus Veggies, Alien bread, Uranus Danish, and Moon Hamburgers. After the feast, the class took a field trip to the planetarium.

This classroom was extremely colorful with many posters on the wall and a variety of students’ work displayed around the room. The multiple intelligences were reflected in actual photographs of students exhibiting each intelligence. For example, there was a photograph of children climbing ropes for bodily-kinesthetic and another photograph that showed children helping one another during a group activity for interpersonal intelligence. The teacher also had MI learning stations set up around the room to which students could go during activity time. The researcher noted positive

teacher and student interaction, and the teacher demonstrated affection to the students by hugging and complimenting them on their behavior and attentive work during the lesson.

Classroom observation 2. The second class observed by the researcher was the combined first and second grade classroom. This class was observed during a science lesson where the lesson plan objective was to learn about the solar system. The teacher used a variety of instructional methodologies for this lesson. First, she had the class sit in their circle time area, and she read them a book about the planets, during which she solicited participation from the students to help her complete the reading. Then the teacher wrote on the chalkboard, "How are planets different from stars?" Students raised their hands and, as they offered answers, the teachers wrote their responses on the chalkboard. After this discussion, the class stood up and sang the song, "Star Bright" while also using sign language. The children enjoyed singing this song and manipulating their hands and bodies. The researcher rated the students' reaction to the lesson a "5" (designating the highest possible rating out of a scale of 0 to 5) due to their high level of enthusiasm. Student participation was rated a "5" on a scale of 1 to 5, with 1 being low and 5 being high. The assessments that the teacher utilized to measure student learning were teacher-directed questions to the students and teacher observation of which students gained understanding of the material covered. The intelligences observed being used during this lesson were linguistic, musical, and bodily-kinesthetic. They were demonstrated by the reading of the book and the singing and acting out of the song through movement.

The investigator observed that there were overt signs that detailed the various multiple intelligences. The walls of the classroom were colorful and filled with many posters. In the middle of the classroom, there was a large teacher-made paper mache` model of the solar system, which brought the planets to life for the students through observation and touch. There were tables with six chairs around them at which the students could do their work. The researcher observed that the students were extremely attentive and well behaved. The teacher was very positive with the comments she made to the students, and she was also gentle with any constructive criticisms.

Classroom observation 3. The final observation was done in a fourth grade class during their language arts period. The lesson plan objective was to have students demonstrate understanding that a well-written story contains a lot of descriptive detail. To introduce this topic, the teacher had the class sit on a futon to watch a video about space. This video did not have words or people. Instead, it contained only beautiful scenes of outer space coupled with background music. After the video ended, the teacher facilitated a discussion on what the students liked about it. He then used the video as a means to describe how important it is to include a lot of descriptive detail when writing an outline and a story. Afterwards, he asked the class to take out their journals and to compose a story about the topic of space, making sure to include descriptive details. The researcher scored student reaction to the lesson as a “4” on a scale of zero (low reaction) to five (high reaction).

The investigator noticed that some students appeared bored during the video, but the students seemed to enjoy the dialogue and the writing exercise. Student participation

in the lesson was scored a “4.5” on a scale of one (low) to five (high). Students were seen using linguistic and musical intelligences during the lesson. The teacher used student questioning as a means of assessing whether the students understood the concept he was trying to teach. Also, he would analyze students’ journal writing to assess their use of descriptive details.

The class observed was located in one of the portable classroom units and it had only two small windows next to the doorway. On the walls, there were eight photographs that displayed different students acting out the various multiple intelligences. These photographs were labeled to define each intelligence that was pictured. The walls were also decorated with stimulating pictures of various topics in science, literature, and history. In the front of the room, were banners that read, “ Be the Best You Can Be” and “ The Sky is the Limit.” The researcher observed a positive relationship between the teacher and the students. The teacher clearly respected the students’ feelings and thoughts and the students appeared to enjoy his sense of humor and to be very comfortable with him.

Teacher interviews. The investigator had the opportunity to interview a master teacher who has been teaching for over eighteen years and has been with her current grade level for nine years. The teacher was observed by the researcher during the class observation of magnets. This third grade teacher was awarded the honor of being elected as the 1996 state teacher of the year and, more recently, as one of the top teachers in the school district. She is known throughout the school for her innovative and creative approaches to learning. The following is a synopsis of the interview:

Researcher: How do you assess students' strength intelligences?

Teacher: I use a questionnaire that I fill out with the students on their likes and dislikes. Often through this, I can discover theory strength intelligences. I also look at the MI centers that they gravitate to.

Researcher: Do you know what your dominant intelligences are? Are they reflective in your development of lesson plans in the curriculum?

Teacher: I would say I am strong in linguistics and used to be weaker in math (logical mathematical). Knowing this, I decided to take classes in math in order to improve my skills. Now I do a lot with math and science in the classroom, and I really enjoy teaching these subjects.

Researcher: Describe how you collaborate with other teachers regarding curriculum issues. Are there grade level teams? Is there cross-grade level sharing?

Teacher: I like to invite other classes and teachers to my class. It gives everyone a chance to exchange ideas and be involved together. We do have grade level teams that meet once a month. There are three other third grade teacher beside myself. We also meet socially and discuss issues. As a faculty, we have monthly staff meetings to review curricular topics.

Researcher: Why do you like using MI in the classroom?

Teacher: MI allows me to say, "Let's do it!" and to see "What if..." I enjoy making learning fun and it challenges my creative side. MI also provides a lot of hands on learning of which I am a proponent.

Researcher: What is your philosophy of teaching? Is MI reflected in your philosophy of teaching?

Teacher: My philosophy as a teacher has always been to look for each child's strengths. MI certainly addresses that aspect. I also believe that, with MI, the teacher becomes a facilitator rather than just the giver of knowledge.

Researcher: What are the drawbacks (if any) to MI in the classroom?

Teacher: I think some teachers are afraid of it because it does challenge you as a teacher. You have to be more creative in finding ways to deliver the same information. You also need organization and flexibility when using MI in the classroom.

Researcher: What advice would you give to other teachers who are just beginning with MI?

Teacher: Read as much literature as you can on MI. There is no one way to do MI. I would say to try it and, if it feels right, then you know it's the framework you've been looking for.

The second teacher interview was with a seasoned fourth grade teacher who had been teaching for 22 years. The researcher did not have time to observe her class. She has been teaching the fourth grade for three years at this school. The following is a synopsis of her interview:

Researcher: How do you assess students' strength intelligences?

Teacher: I do it intuitively... I just sense it in children. Gardener gave us a framework to work within and I find it refreshing, as teacher who has been around a lot, to look for student's strengths first instead of looking for the weaknesses.

Researcher: Describe how you collaborate with other teacher regarding curriculum issues. Are there grade level teams? Is there cross-grade level sharing?

Teacher: I don't feel that there is enough collaboration in the school, especially in fourth and fifth grades. There is a monthly faculty meeting, but we need more time as peers to discuss real curriculum issues. Passing comments to another teacher in the morning is not enough collaboration.

Researcher: Why do you like MI in the classroom?

Teacher: I like how MI fosters the interpersonal skills. There are many bilingual students at our school and you need to teach these kids from many different avenues, not just using the linguistic focus that is so heavily weighted in our society.

Researcher: What is your philosophy of teaching? Is MI reflected in your philosophy of teaching?

Teacher: I am more of a facilitator. I encourage students to work together in groups and to teach one another. MI is a philosophy that encourages students to understand how they learn and it goes beyond the traditional views of intelligences. I believe every teacher should look 'beyond' every student and encourage them to be who they really are. MI does that, but so does down right good teaching sense!

Researcher: What are the drawbacks (if any) to using MI in the classroom?

Teacher: Teachers may misinterpret it and then it becomes too limiting. Sometimes people want to pigeon hole everything... I don't think Gardner ever had that idea.

Researcher: What advice would you give to other teachers who are just beginning with MI?

Teacher: MI philosophy is so inherent in good teaching practices. As a teacher, I would say to try to incorporate it with understanding and depth. Use it as a means of various entry points where students can learn.

Summary

This chapter presented the analysis of the data and the findings resulting from the principal telephone interview survey and the teacher questionnaire. Supplementing this data was an ethnographic account of three MI schools that were visited by the investigator. Out of the 34 schools that had implemented the theory of multiple intelligences, 20 principals agreed to complete a telephone interview with the researcher which resulted in a 58% overall response rate. Seventeen public elementary schools, including charter and magnet schools, participated in the study as well as three private schools. The median number of years of implementation of the theory of multiple intelligences among these schools was six and a half years, with a range between three and twelve years. Among the 20 schools, 41 teacher questionnaires were sent out for completion. Of these 41 teacher questionnaires, 18 were completed, resulting in a 44% response rate. Thirteen of the 20 schools that chose to participate in the principal interview, participated in the teacher questionnaire. This resulted in a school response

rate of 65%.

Responses to questions from both the principal interview survey and the teacher questionnaire regarding the areas of curriculum implementation and teacher collaboration, instructional methodology, and academic assessment were delineated in this chapter. Along with this data, an ethnographic study of three MI schools representing the East Coast, the Midwest, and the Southwest regions of the United States were discussed. A detailed account of how each school dealt with curriculum implementation and teacher collaboration, instructional methodology, and academic assessment was described in this chapter. The information was gathered by the investigator over a two-day period which included face-to-face interviews with parents, principals, and teachers as well as class observations.

CHAPTER FIVE

Summary, Conclusions, and Recommendations

Introduction

The purpose of this chapter is to present the summary of the findings, the conclusions, and the recommendations of the study. A summary of the study's purpose and the methods and procedures used to address the stated research question are also included. In addition, guidelines outlining effective application of the theory of multiple intelligences for schools to utilize in future practice are provided in this chapter. Furthermore, recommendations for future research and practice are given. This chapter includes the following subsections: Summary of the study, findings and commonalities, guidelines for effective application of the theory of multiple intelligences, and recommendations for future research and practice.

Summary of the Study

The purpose of this study was to examine the commonalities among twenty elementary schools in the United States that have implemented the theory of multiple intelligences for three years or more. Due to the absence of pedagogical guidelines and educational approaches to this theory, this study was intended to provide effective strategies for future application in curriculum implementation and teacher collaboration, instructional methodology, and academic assessment. Through understanding how teachers, principals, parents, and students responded in an environment into which the theory of multiple intelligences was incorporated, a set of commonalities was identified.

These commonalities led to the development of a set of guidelines that contains effective strategies for implementing the theory of multiple intelligences in an educational setting. The research design employed for this study was the survey method. The data collection instruments used were two cross-sectional surveys. The first survey was a principal questionnaire in the form of an interview guide. Its objective was to obtain generic information from the principals regarding school implementation strategies and applications of the theory of multiple intelligences. Of the 34 elementary principals contacted by phone for this survey, 20 of them agreed to participate in a 30 to 45 minute phone interview for the study. In order to further elaborate upon the information provided by the principals, permission was granted to the researcher by each principal to send a written questionnaire to two or more third or fourth grade teachers per school. Of the 41 questionnaires sent out, 18 teachers representing 13 schools responded and participated in this study.

Data collected from these qualitative principal interviews and teacher questionnaires was compiled and a content analysis was performed in order to assess the results. This data was then triangulated through site visits to three elementary schools selected out of the twenty schools participating in the study that have implemented the theory of multiple intelligences. During the site visits, data was collected through researcher non-participant observations in the classrooms and face-to-face interviews with principals, teachers, and parents.

Findings and Results from Principal and Teacher Questionnaires

Twenty of the 34 principals initially contacted agreed to a phone interview with

the researcher. This is a response rate of 58%. Seventeen public schools, including charter and magnet schools, participated in the study along with three private schools. Geographically, 50% of the schools are located in the East Coast, 30% are in the Midwest, and 20% are in the West Coast/Southwest regions of the United States. Although the MI implementation criterion for the study was three years, the median number of years of implementation of this theory among these schools is 6.5 years, with a range between 3 and 12 years. Of the 14 principals that chose not to participate in the study, the most prominent reasons for non-compliance are the following: 43% of the principals did not respond to the initial interview letter or to the follow-up phone calls, 21% stated that their schools are no longer implementing the theory of MI, and 14% stated that they are new to their positions and did not have time to participate. In addition to gaining information on schools that implement the theory of MI from principals, the researcher also sent questionnaires to two teachers in each school, with the exception of one school, which requested three questionnaires. The questionnaire consisted of 15 open-ended and fixed items. Thirteen out of the 20 schools to which the questionnaires were sent participated, which resulted in a response rate of 65%. A total of 41 questionnaires were sent out to teachers and eighteen were returned to the researcher. This resulted in a response rate of 44%. Three of the schools had two respondents each to the questionnaire, one school had three respondents, and nine schools each had one respondent. Of the responding teachers, the average number of years in the teaching profession was 14.6 years, with a range from 4 to 33 years. This finding demonstrates that the majority of teachers who chose to participate in the study

were highly experienced and had spent a substantial amount of time in their profession. The average number of years that participating teachers had been implementing MI was 5.7 years, with a range of 1.5 years to 9 years. Of the seven schools which did not respond to the teacher questionnaire, the two most prominent reasons for non-compliance are as follows: 28% stated that the questionnaire required too much time to complete and 28% stated that they were too busy. It is important to note that all of the teachers from schools that chose not to participate in the study indicated that their reasons for non-compliance were not related to any negative feelings about MI or about its effects on classroom instruction.

Summary and Findings of School Site Visits

The schools selected for the two-day site visits represent different geographical regions of the United States, with School A representing the East Coast, School B the Midwest, and School C the Southwest region of the country. Although the criterion for the schools selected for the study was three years of MI implementation, all three of these schools had actually been incorporating MI in their curriculums for six years or more. Both Schools A and C are public elementary schools (kindergarten through fifth grade) and School B represents the private, independent school faction (Pre-K to eighth grade). The three site schools were also chosen since they were an accurate representation of the twenty that participated in the study. All three schools reported that they have an excellent reputation within their community. After the site visits were completed at the three schools, the investigator did not find any different information that was reported from the principal or teacher questionnaires except for a more in-depth

perspective of the school's implementation of MI. After observing these three schools, the researcher confirmed that the conceptual philosophical approach that represented Gardner's theory of MI was properly implemented in these schools.

All of the schools visited began incorporating the theory of multiple intelligences through principal initiation; however, all three current principals noted that MI was, and still is, fully implemented through a collaborative partnership between the teachers and administrators. Time devoted to teacher collaboration and inservice was common among all three schools.

Commonalities

The first commonality identified was related to teacher collaboration. The most common form of teacher collaboration of MI ideas in all three schools was monthly faculty meetings and grade level team meetings. The sentiment of many of the teachers interviewed during the site visits was that even with their monthly grade level meetings, there was still a need for more time to be allotted for dialogue and collaboration with their colleagues regarding MI theory and implementation ideas. All three schools also have mentoring programs in which experienced teachers are paired with newer teachers to ease the transition and provide ongoing support and training. However, School A is the only school to have a MI coordinator whose role is to work with all teachers on MI training and curricular and instructional ideas and to act as the liaison between the staff and the administration. This faculty position is one that both the teachers and principal felt is crucial to effectively incorporate MI into their school. School A also requires each teacher to serve on a MI committee that represents one of the eight intelligences.

These committees meet monthly to review research and develop innovative instructional strategies, which are then shared with the rest of the school staff. One unique focus of School B is that it sets aside one day each month for inservice training, during which time teachers spend half of the day learning about innovative research and instructional ideas, and the remainder of the day is set aside for teacher planning and collaboration. None of the schools visited had a centrally located MI resource library for teachers and administrative staff to use.

The second commonality identified in the site visits was the fact that all three of the schools visited had unique school programs that exemplified the theory of multiple intelligences. School A is notable for a flow room in which students can explore all of the intelligences, the use of Positive Discipline that incorporates the personal intelligences, the MI Express Club, and also other extracurricular school clubs that include many of the tenets of MI. School B uses student-selected interest groups to incorporate the eight different intelligences. School C has a Gifted Enrichment program, bilingual art class, and kinesthetic physical education classes to enhance many of the intelligences. All three of the schools have computer- assisted learning programs with computers both in their classrooms and in a computer technology lab. All three schools emphasize the personal intelligences (interpersonal and intrapersonal). At each school, the researcher observed students showing respect to one another and to the teachers, orderly conduct during transitions from activities, and friendly and well-mannered behavior. The three principals could not pinpoint MI as the sole reason for this kind of behavior in their schools, but felt that low discipline problems may be a byproduct of

having MI in their schools.

The third commonality identified in all three schools visited was an integrated arts program incorporated within the curriculum. Having a MI-based curriculum was a natural fit for incorporating the arts. School B had the most emphasized integrated arts program of all of the schools. This may have been due to the fact that it was a private school and did not have the constraints of budget cuts as seen in many public schools. A fourth commonality identified in all three schools visited was the focus of MI in their mission statement and in motivational materials. Of all of the schools visited, School A was the most overt in its implementation of MI. This was observed through classroom posters and school banners depicting the different intelligences and through identification and teacher reinforcement of students as they utilized different intelligences. Schools B and C approached MI in a more subtle way. Instead of explicitly labeling the intelligences, the teachers believe that the students are “living” them. Whether the schools were subtle or overt in their portrayal of the various intelligences, all three schools list the concept of the theory of MI and its role in strengthening student learning in their mission statements. Their mission statements are all published in the school handbooks, which are distributed to the parents of every student.

A commonality identified in two of the schools (Schools B and C) was the use of a thematic approach to the curriculum, where themes are decided by the staff as a whole and then individual teachers use their own discretion as to how to apply the theme to their grade. However, in all three of the schools, individual teachers are given the discretion to decide exactly how to incorporate the theory of multiple intelligences in

their classrooms. Some of the teachers who were observed incorporate MI through the use of learning stations that represent each of the intelligences. Others use student-generated projects or computer-assisted instruction to incorporate MI in their classrooms. Throughout all of the classrooms observed, it was seen that there is not one exact way to depict each of the intelligences.

Another commonality, parental involvement, was strong in all three schools visited. Parents were encouraged to participate in all aspects of the school activities, from fundraising events to volunteering as teacher helpers. All of the parents interviewed seemed to feel that the theory of MI helps to identify student strengths and that it has had a positive impact on how their children learned and retained knowledge. Several of the parents felt that this has also led to increased self-esteem and self-respect in their children.

Another commonality identified across all three schools related to teachers keeping anecdotal records to document student learning throughout the year. All of the schools also keep portfolios on each student. These portfolios show parents how their children progress over the year and act as a place for students to house their exemplary work. However, none of the schools have assessments for their portfolios. Schools A and C utilize a combination of authentic and traditional assessments with its students. School B chose to use mainly authentic assessments to evaluate student learning. Schools A and C use traditional report cards to record the academic progress of their students. School B uses narratives and a year-end continuum to report the progress of its students. Schools B and C have at least two parent conferences a year in order to

further discuss student academic growth and social development.

And finally, the last commonality identified across all three schools was the use of standardized tests to measure how well their students compare to the national norm, and they all scored in the seventieth percentile or above. Schools A and C were mandated by their districts to administer these tests. School B, however, was a private school and chose to administer standardized tests only to their middle school students, since many of these students would be transferring to high schools that require such standardized data.

During the investigator's visits to classrooms, the most common form of assessment observed was teacher observation of how students acquire and use learned knowledge during the lesson. Teachers often obtained this information by questioning students and observing if they are able to answer them correctly and by walking around the room and observing students as they are working. The second most utilized form of assessment was student self-assessment.

Other Findings

Many of the teachers interviewed felt that MI was the vehicle to deliver the instruction and to help identify student strengths in order to facilitate learning. When asked to comment on the drawbacks of including MI in the classroom, teachers said that there is a great need for teacher commitment and involvement with MI in order for it to work. Also mentioned was a concern that some teachers may address the intelligences superficially instead of in-depth for greater learning understanding. Additionally, teachers felt that using MI in the classroom requires teachers to be more creative in finding ways to deliver information, requiring them to be more organized and flexible.

The interviewed teachers using MI discovered that they are challenged to look for their own dominant intelligences. In fact, some of the teachers interviewed became aware that they not only need to acknowledge their own strength intelligences, but also to strengthen their weaker ones. Many teachers admitted that they use this knowledge and awareness about themselves when they are working on lesson plans and in the classroom.

Research Question

The research question which was the basis of this study was: What were the major identifiable commonalities of effective applications of the theory of multiple intelligences among those elementary schools investigated? Applications of this theory involved curriculum implementation and teacher collaboration, instructional methodology, and academic assessment. The following section will be broken up into three subcategories that address the above research question across three dimensions: curriculum implementation and teacher collaboration, instructional methodology, and assessment approaches.

Curriculum Implementation and Teacher Collaboration Commonalities

In the area of curriculum implementation and teacher collaboration, several commonalities were discovered through the triangulation of the data received from the principal interviews, teacher questionnaires, and information gathered during site visitations. One commonality noted is that there is a need for consistent, ongoing staff development opportunities and teacher collaboration regarding MI implementation. The majority (95%) of the principals interviewed noted that their staff had opportunities for

development on MI theory (Table 3) and that staff collaboration, teacher self-reflection, and teacher commitment are all necessary ingredients in successful MI implementation (Table 7). Of the teachers surveyed, 67% have staff collaboration meetings centered around MI (Table 8), with 55% of teachers noting that these meetings are held weekly and monthly (Table 9). Additionally, 50% of these teachers stated that they had school workshops and inservice days regarding MI implementation (Table 9). During the site visitation interviews, teachers supported the importance of staff development and teacher collaboration time. However, the majority noted that more time needs to be devoted to both of these areas.

With many teachers retiring and the need for more teachers to be added to each school staff, it is especially important to provide new teachers with staff development opportunities surrounding MI theory. Of the principals interviewed, 61% stated that they had training programs and planning sessions for new teachers on specific instructional methods relating to MI (Table 11). Additionally, 50% of principals mentioned that they team new teachers with mentor teachers in order to provide a constant means of support throughout each school day (Table 11).

Another important aspect of staff development is the availability of a resource library center for teachers on MI (books, videotapes, and articles). Of the principals interviewed, 50% stated that their schools have such libraries. Although the three schools visited did not have teacher resource libraries, all of their principals noted that this is a necessary goal for the future.

Another commonality discovered is that the use of MI in classrooms assists

teachers in identifying students' strength intelligences and that it affords them the opportunity to view each student from a strength perspective. Of the principals interviewed, 75% supported this notion and saw MI as an avenue for identifying and targeting the strengths and educational needs of students (Table 5). The principals viewed this as one of the main strengths of MI based upon the underlying philosophy of multiple intelligences and not on any formal MI inventories that are on the market. All of the teachers interviewed during site visits noted that they purposely seek to identify each student's strength intelligences and they used this information to guide instruction. Additionally, parents interviewed during site visits noted that they felt that their children benefited from having teachers view them from a strength perspective and that this approach contributed to their self-esteem and learning.

It was also found that MI theory easily aligns with various district curriculum guides. Of the principals interviewed, 50% stated that MI aligns with their curriculum guide and 61% of teachers concurred. In fact, 60% of principals stated that MI is an effective vehicle to deliver instruction (Table 4).

With regard to student interaction and learning within the curriculum, the researcher wanted to ascertain from the teachers which, if any, of the eight intelligences affected learning more than the others (Table 10). In responding, many of the teachers listed more than one intelligence as affecting learning more. It is noted that four of the intelligences each had a common response rate, with 22% of teachers identifying musical, the personal (interpersonal and intrapersonal), spatial, and logical-mathematical intelligences. Bodily-kinesthetic intelligence had the most prevalent response rate with

28%, linguistic intelligence was identified with a response rate of 17%, and 11% of teachers felt that all of the intelligences are equally important. With these findings, it appears that teachers are not dramatically viewing one intelligence as more effective than the others. Rather, there is a fairly equal distribution among them within the curriculum.

Instructional Methodology Commonalities

In the area of instructional methodology, several commonalities and findings were discovered through the triangulation of the data received from the principal interviews, teacher questionnaires, and information gathered during site visitations. When teachers were asked to choose from a pre-determined list of instructional methods to determine which ones they utilize the most in their classrooms, the three most common instructional methods identified were self-selected student projects (94%), computer-assisted instruction (67%), and MI learning stations (61%) (Table 12). This data was further substantiated during the investigator's site visits, where it was noted that these common methods are used in the in all three of the schools.

In order to gain a clearer understanding of how teachers employ different MI instructional approaches, teachers were asked to identify two successful strategies they have used for each of the eight intelligences. For spatial intelligence, the two most common instructional strategies were doing projects via model making (50%) and drawing pictures to help describe something (44%) (Table 13). For linguistic intelligence, teachers identified the most prevalent strategy as writing tasks in content areas (50%), reading a story about a topic (33%) and using word games or language arts

exercises (33%) as important (Table 14). For bodily-kinesthetic intelligence, the two most common instructional strategies identified were the movement of the body or use of dramatic play to demonstrate a concept (89%) and experimentation and model-making using a variety of materials (22%) (Table 15). For musical intelligence, the most successful strategy listed was student or teacher created songs, chants, and musical rhythms about a content topic (72%). The second most prevalent methods identified for musical intelligence are the use or discussion of musical instruments in order to explain a topic (22%) and the use of music to depict periods in history or a specific topic (22%) (Table 16). For interpersonal intelligence, the two most common strategies identified are students working in cooperative groups (83%) and students working with a partner on an assigned task (22%) (Table 17). For logical-mathematical intelligence, the two most successful strategies listed are the use of problem solving exercises and math games (67%) and the use of graphic organizers to explain something (39%) (Table 18). For intrapersonal intelligence, the two most commonly identified instructional strategies are students writing personal reflection essays (50%) and students keeping a journal or diary (33%) (Table 19). For naturalistic intelligence, the two most successful strategies identified are field trips or nature walks outside the classroom (39%) and student projects involving a nature theme (22%) (Table 20). It is important to note, however, that when asked about naturalistic intelligence, several teachers did not respond or answered that they did not have any experience implementing this intelligence. This may have been due to the fact that naturalistic intelligence is the newest of all of Gardner's depicted intelligences, and many teachers may not be familiar with it yet.

When teachers who have been using MI were asked to give advice to teachers who were planning to incorporate MI in their classrooms (Table 21), 61% of them suggested looking for ways teachers may already use MI and then slowly expand upon them. Of the teachers surveyed, 33% suggested that teachers use the different intelligences appropriately whenever they seem to fit in the curriculum or lesson plan. This idea was also mentioned in several of the teacher site interviews, where they noted the importance of incorporating the intelligences with understanding and depth as opposed to inserting them superficially into the curriculum. Finally, 22% of respondents suggested that teachers create awareness of MI and the different intelligences through projects and student reflective assignments.

Assessment Approaches Commonalities

In the area of assessment approaches, several commonalities and findings were discovered through the triangulation of the data received from the principal interviews, teacher questionnaires, and information gathered during site visitations. When asked about their school's assessment approaches, the principal's responses denoted similarities (Table 22). Authentic based assessments, such as projects and portfolios, were used in 90% of the schools. Standardized assessments were used in 70% of the schools. Traditional report cards were used by 45% of schools surveyed; however, none of the schools visited connected their report cards with the multiple intelligences approach. Non-traditional report cards, such as progress reports and narratives, were used by 30% of schools. All schools used more than one of these assessments and there were varied combinations of them.

Portfolios were a common assessment tool, evidenced by the fact that 80% of principals interviewed mentioned that their schools use portfolios (Table 23) and 72% of teachers surveyed responded that they used portfolios in their classrooms (Table 25). Additionally, during the researcher's site visitations, it was noted that portfolios also were used throughout the schools as a means of communicating students' progress with parents.

It was found that 70% of the schools used some form of standardized assessments (Table 22). When interviewed, 85% of the principals noted that the MI based curriculum met the educational standards that are addressed on state standardized tests (Table 24). Many principals included additional comments on MI and their school's usage of standardized tests. Some of these comments included: "MI helps prepare students for these standardized tests and our scores are higher than the state norm," "We followed a class from second to fifth grade and found that our school has the third highest proficiency level in the state... MI has definitely changed things!," and "Last year, our score had the highest scores on state wide tests...we knocked everybody's socks off!" During the site visitations, the investigator learned that School A was acknowledged for its exemplary status within its district, based on it's strong standardized test scores. School B voluntarily administered state standardized tests, and the students earned an above average rating in the 70th percentile. School C was awarded Blue Ribbon Status, partially due to the fact that the students scored above average on their state's standardized tests. This data leads to the finding that an MI-based curriculum appears to have a positive impact on student learning and achievement,

as noted by the fact that it meets educational standards that are addressed on state and national standardized tests.

In order to gain a clearer understanding of what assessment procedures teachers employ to evaluate student learning, they were asked to identify two successful procedures they have used for each of the eight intelligences. For spatial intelligence, the two most common assessment procedures were teacher observations and anecdotal records (44%) and class discussions and student sharing of projects and learning tasks (28%) (Table 26). For linguistic intelligence, the two most commonly used assessment approaches were students self-assessment through writing (33%) and teacher observation (28%) (Table 27). For bodily-kinesthetic, the two most prevalent assessment approaches were teacher observation of student participation (45%) and students role-playing answers to teacher questions (28%) (Table 28). For musical intelligence the two most commonly used assessments were teacher observation of learned task (33%) and students creating a song to explain what they learned (28%) (Table 29). For interpersonal intelligence, the two most commonly listed assessments were analysis of completed assignments (39%) and teacher observation and anecdotal records (33%) (Table 30). For logical-mathematical intelligence, the two most commonly listed assessments were teacher observation of student skills and completion of task (50%) and written and/or other expressions of logical reasoning to explain the “why” of things (50%) (Table 31). For intrapersonal intelligence, the two most commonly listed assessment procedures were teacher monitoring of student writing to assess depth of thought on topics (39%) and student self-assessment reflecting common

goals and activities (39%) (Table 32). For naturalistic intelligence, the two most commonly listed assessment procedures were teacher observation (44%) and student presentations of projects with rubrics for scoring (22%) (Table 32).

Teacher observation ranked in the top two assessment procedures for each intelligence, with the exception of interpersonal, where it ranked as the third most prevalent assessment approach used (28%). It appears as though teacher observation is a critical component in assessing student learning in a MI based curriculum. This finding was further validated through the investigators's site visitations, where it was noted that teacher observation was used as an assessment in each classroom observed.

Guidelines for Effective Application Strategies for the Theory of Multiple Intelligences

Through an analysis of the data and findings of this study, the following guidelines and recommendations were established in order to outline effective application of the theory of multiple intelligences that schools can utilize in future practice:

Curriculum Implementation and Teacher Collaboration

1. Have monthly inservice days for teacher collaboration on MI curricular ideas. This will allow for consistent, ongoing staff development opportunities regarding MI implementation.
2. Each month, incorporate specific time during the regular school day for teachers to plan and collaborate on MI ideas together. This will allow for more consistency and better coordination and collaboration among colleagues.
3. Have a training program for new teacher hires on specific instructional methods relating to MI. Also, team new teachers with mentor teachers that have been

incorporating MI in their classroom for a substantial period of time. This will allow new teachers to have a complete understanding of the basis of the MI curriculum and to feel supported as they master the implementation of key aspects of the theory in their classroom.

4. Have a designated MI coordinator in the school. This person will function as the coordinator of MI implementation among all teachers, act as another support person for new teachers, serve as a liaison between administrators and staff, and keep the MI curriculum program focused within the school community.

5. Have a centrally located MI resource center in the school. This center should include books, tapes, articles, and other resources that would be beneficial to teachers and staff as they incorporate the theory into their school. This will allow for new administrative and teacher staff to learn about MI, while also allowing experienced teachers opportunities to enhance and refresh their knowledge of the theory.

6. Organize study areas (i.e. interest groups or flow rooms) where students can choose topics to explore and expand the use of their MI potentials. This will allow for students to engage in activities that will enhance participation and excitement in their own learning, while reinforcing their strength intelligences and improving their less dominant intelligences.

7. Have teachers strive to identify their strengths and weaknesses regarding their own intelligences. This awareness will allow teachers to explicitly focus on teaching from areas that may not be their strengths. Also, with this knowledge, teachers can take courses to help strengthen their less dominant intelligences.

8. Incorporate an integrated arts program that enhances a MI curriculum. By regularly including music, art, dance, and theatrical arts in the curriculum, students are given opportunities to fully manifest the eight intelligences in themselves.

Instructional Methodology

1. Although there is not one exact instructional method to use when incorporating MI, teachers may find that using combinations of self-selected student projects, computer-assisted instruction, and MI learning centers can be beneficial to student learning. These methods lend themselves to all of the intelligences, thereby meeting the needs of every learner while allowing for implementation of various approaches to MI in the class.

2. Teachers who are planning to incorporate MI in their classroom should look for ways in which they are already addressing different intelligences and then slowly expand on these approaches. Many teachers have been instinctively practicing the tenets of MI for years, allowing them to slowly incorporate an explicit MI framework into their day.

3. Teachers should encourage students to recognize and identify different intelligences. This will allow students to identify their own strength intelligences as well as other intelligences that they need to strengthen. By so doing, this will help develop greater self-esteem and an understanding and acceptance of differences among individuals.

4. Incorporate the eight intelligences with understanding and depth as opposed

to inserting them superficially into the curriculum. This allows for true implementation of the theory of MI and, with this, the different intelligences can be utilized appropriately within the curriculum.

5. Although there are many different instructional strategies that can be employed for the eight different intelligences, the following strategies have been found to be successful and are recommended for MI classrooms:

- A. *Spatial intelligence*: Students do projects via the making of models and draw pictures to help describe something.
- B. *Linguistic intelligence*: Writing tasks in all content areas, reading a story about a topic, and using word games or language arts exercises.
- C. *Bodily-kinesthetic intelligence*: Movement of the body or use of dramatic play to demonstrate a concept and experimentation and model-making with a variety of materials.
- D. *Musical intelligence*: Using student or teacher created songs, chants, and musical rhythms about a content topic, use or discuss musical instruments in order to explain a topic, and use of music to depict periods in history or a specific topic.
- E. *Interpersonal intelligence*: Students work in cooperative groups and/or with a partner on an assigned task.
- F. *Logical-mathematical intelligence*: Use problem-solving exercises and math games, and utilize graphic organizers (bar graphs, timelines, tallying) to explain something.

G. Intrapersonal intelligence: Have students write personal reflection essays and keep a journal or a diary.

H. Naturalistic intelligence: Have field trips or nature walks outside the classroom and use student projects involving a nature theme.

Assessment Approaches

1. Have teachers use authentic-based assessments as much as possible. From an MI perspective, this allows for a greater degree of expression regarding a student's acquired learning and knowledge.

2. Use a portfolio to house each student's work throughout the year. This allows students and parents an opportunity to gauge how the student has progressed over the school year and for the years to follow.

3. Although there are many different assessment approaches that can be employed for the eight different intelligences, the following strategies have been found to be successful and are recommended for MI classrooms:

A. *Spatial intelligence:* Use of teacher observations and class discussions and student sharing of projects and learning tasks.

B. *Linguistic intelligence:* Teacher observation and use of student self-assessment through writing.

C. *Bodily-kinesthetic intelligence:* Teacher observation of student participation and student role playing in order to answer teacher questions.

D. *Musical intelligence:* Teacher observation of learned tasks and student-created songs to explain what they have learned.

- E. *Interpersonal intelligence*: Analysis of how groups worked to complete assignments, teacher observation, and anecdotal records.
- F. *Logical mathematical intelligence*: Teacher observation of student skills and completion of tasks and student written and/or verbal expressions of logical reasoning to explain the “why” of things.
- G. *Intrapersonal intelligence*: Use of teacher monitoring of student writing to assess depth of thought on topics and student self-assessment reflecting on common goals and activities.
- H. *Naturalistic intelligence*: Teacher observation and student presentation of projects with rubrics for scoring.

General Guidelines

1. For future schools investigating the possibility of initiating MI, utilize principal and teacher collaboration on a regular basis. This will allow the staff to feel committed to the project, which will lead to greater involvement and dedication among all participants.
2. Include a description of the theory of multiple intelligences and its tenets in the school mission statement. This statement, usually housed in the school handbook, allows parents and community members the opportunity to understand the school’s framework, leading to the possibility of greater support and participation.
3. Have visuals that identify the different intelligences around the classroom. This will allow for easier identification and reinforcement of strength intelligences as well as less dominant intelligences.

4. Have active parent involvement in the school, particularly in the classrooms and during conferences. This will allow for greater parent awareness of MI and a more in-depth understanding of how it affects their child's learning. Also, encouraging parents to become involved in their child's school leads towards a stronger sense of community and opens the lines of communication between parents and school staff.

Recommendations for Future Research and Practice

Future research. This study identified the commonalities existing among elementary schools that have implemented the theory of multiple intelligences for three years or more. The researcher chose to include only elementary schools and surveyed third or fourth grade teachers. Thus, the findings of this study can only be generalized to elementary schools. A future study could be conducted to include both elementary and secondary schools that would encompass a full range of students from kindergarten to high school. This study could ascertain if there were any differences and/or commonalities among teacher instructional strategies, curriculum implementation and teacher collaboration, as well as assessment approaches between elementary and secondary schools implementing the theory of multiple intelligences.

In this era of efforts to reform and improve our country's educational system, it is important that any new innovative educational approach is documented to ascertain if student achievement has improved with the new approach's application. One finding of this study was that MI based curriculums appear to have a positive impact on student

learning and achievement. Although there has been anecdotal evidence that MI improves achievement in schools, a future study is suggested in order to examine the achievement factors in MI schools and compare the results to non-MI schools. Standardized test scores, report cards, and other measures to evaluate student achievement could be used in such a study.

In this study, the investigator visited three MI schools. These three schools were examined in order to ascertain whether there were any commonalities that existed among them. A related study could be conducted to compare non-MI schools with MI schools. By conducting in-depth site visits to both MI and non-MI schools, similarities and differences could be noted, examined, and studied in order to determine which findings could be solely attributed to the incorporation of MI in a school.

Future practice. In implementing a qualitative study, there are several approaches that a researcher can do to express both the content and extent of a study. For this particular study, the investigator combined dimensions of both the survey method and ethnographic research. The researcher postulates that this combination approach can add value for future qualitative studies. The survey method can provide an overview of the information that is being sought in a study while the observation data obtained through the ethnographic research could add a dimension of richness and depth. This combined approach is particularly applicable when the sample population is a small one.

As more and more schools look for ways to improve their students' academic and social skills, approaches like Howard Gardner's theory of multiple intelligences will

be evaluated. For any new educational venture to succeed, such as the incorporation of MI, principals and teachers have to embrace the concept fully by learning as much about the topic as possible and collaborating with each other so that a commitment is made by everyone involved in the project. For some, the theory of multiple intelligences may be just a philosophy that states that children have a reservoir of talents that should be embraced and cultivated. However, the investigator postulates that a major contribution the theory of multiple intelligences has made is to help the general public understand intelligence is multi-faceted and not just limited to those skills measured by IQ tests. This concept has helped many educators value and understand the various talents that each child possesses. The researcher found that the use of MI in the classroom supports teachers in identifying students' strength intelligences and it afforded them the opportunity to view each student from a strength perspective. This varies dramatically from past education approaches where students were viewed from a needs-based or deficit perspective. Due to this, the researcher further postulates that this strength perspective to learning becomes so ingrained in a teacher's belief system that it will remain with him/her even if the school no longer embraces MI as the focus of its curriculum.

In this study, more than half of the principals interviewed stated that MI was an effective vehicle to deliver instruction. MI is not a curriculum in itself, rather it is a framework by which the curriculum is delivered. By allowing teachers a way to approach the subject matter in a varied manner to address the different intelligences, MI allows multiple representations of a single topic and makes way for a broader and deeper

understanding. Teaching with MI requires teachers to spend more time planning, organizing, and assessing learning; however, the investigator postulates that MI fosters more creativity which results in a more consistent, higher level of learning for both the students and the teachers.

As the investigator looks to the future, it is unknown whether the theory of multiple intelligences will be a continued paradigm for teaching or just fade into the past. Gardner's theory has legitimized a framework for teaching and provided a vocabulary for what many teachers have intuitively felt for years about learning and good teaching practices. The theory has challenged the status quo concerning what makes us intelligent, and the researcher believes that if this alone has enhanced the way children can learn, then it has made a valuable contribution to the educational equation.

References

- Armstrong, T. (1993). Multiple intelligences in the classroom. Alexandria, VA: Association for Supervision and Curriculum Development.
- Armstrong, T. (1983). 7 kinds of smart: Identifying and developing your many intelligences. New York: Penguin Books.
- Beilin, H. (1989). Piagetian theory. In R. Vasta (Ed.), Six theories of child development: Revised formulations and current issues (pp. 81-97). Greenwich, CT: JAI Press.
- Belson, W.A. (1968). Respondent understanding of survey questions. Polk, 3, 1-13.
- Berelson, B. (1952). Content analysis in communications research. Glencoe, IL: Free Press.
- Binet, A., & Simon, T. (1916). The development of intelligence in children. Baltimore, MD: Williams and Wilkins.
- Bjorklund, D. F. (1989). Children's thinking. Belmont, CA: Brooks/Cole.
- Black, P., & Wiliam, D. (1998). Inside the black box: Raising standards through classroom assessment. Phi Delta Kappa, 80, 139-148.
- Blythe, T., & Gardner, H. (1990). A school for all intelligence. Educational Leadership, 47, 33-37.
- Borg, W. R., & Gall, M. D. (1989). Educational research: An introduction. (Fifth ed.). New York: Longman.

Bradley, M. K., Kallick, B. H., & Regan, H. B. (1991). The staff development manager. A guide to professional growth. Boston: Allyn and Bacon.

Brandt, R. (1987). On assessment in the arts: A conversation with Howard Gardner. Educational Leadership, 45, 30-34.

Burke, K. (1993). The Mindful School: How to assess thoughtful outcomes. Palatine, IL: IRI/Skylight Publishing, Inc.

Campbell, L. (1997). How teachers interpret MI theory. Educational Leadership, 55, 14-19.

Campbell, L., Campbell, L., & Dickinson, D. (1992). Teaching and learning through multiple intelligences. Stanwood, WA: New Horizons For Learning.

Campione, J. C., & Brown, A. L. (1978). Toward a theory of intelligence: Contributions from research with retarded children. Intelligence, 2, 279-304.

Cangelosi, J.S. (1990). Designing tests for evaluating student achievement. New York: Longman.

Carroll, J. B. (1981). Ability and task difficulty in cognitive psychology. Educational Researcher, 10, 11-21.

Colwell, R., & Davidson, L. (1996). Musical intelligence and the benefits of music education. NAASP Bulletin, 80, 55-63.

Costa, A. L. (1981). Teaching for intelligent behavior. Educational Leadership, 39, 29-31.

Cronbach, L. J. (1975). Five decades of public controversy over mental testing.

American Psychologist, 30, 1-14.

Csikszentmihalyi, M. (1990). Flow: The psychology of optimal experience. New York: Harper & Rowe.

Davis, J. (1996, July). The impact of Harvard's Project Zero's work. Paper presented at the Harvard Project Zero Summer Institute, Boston, MA.

Dean, J., & Gross, I. L. (1992). Teaching basic skills through art and music. Phi Delta Kappan, 73, 613-618.

Deese, J. (1993). Human abilities versus intelligence. Intelligence, 17, 107-116.

Denzin, N. K. (1978). The research act: A theoretical introduction to sociological methods: A sourcebook. New York: McGraw-Hill.

Dunn, R., & Dunn, K. (1978). Teaching students through their individual learning styles. Reston, VA: Reston Publishing Co.

Farr, R., & Tone, B. (1994). Portfolio and performance assessment. Fort Worth, TX: Harcourt Brace College Publishers.

Fink, A., & Kosecoft, J. (1985). How to conduct a survey: A step-by-step guide. Newbury Park, CA: SAGE Publications.

Fiske, E. B. (1992). Smart schools, smart kids. New York: Simon and Schuster.

Fogarty, R. (1998). The intelligence-friendly classroom: It just makes sense. Phi Delta Kappan, 79, 655-657.

Frisbie, D.A., & Waltman, K.K. (1992). Developing a personal grading plan. Educational measurement: Issues and measurements, 11, 35-42.

Gardner, H. (1983). Frames of the mind. New York: Basic Books.

Gardner, H. (1993). Multiple intelligences: The theory in practice. New York: Basic Books.

Gardner, H. (1994). Intelligences in theory and practice: A response to Elliot W. Eisner, Robert J. Sternberg, and Henry M. Levin. Network News and Views, August, 2-6.

Gardner, H. (1995). Reflections on multiple intelligences: Myths and messages. Phi Delta Kappan, 97, 200-209.

Gardner, H., & Hatch, T. (1989). Multiple intelligences go to school: Educational implications of the theory of multiple intelligences. Educational Researcher, 18, 4-10.

Gardner, H., Krechevsky, M., Sternberg, R. J., & Okagaki, L. (1994). Intelligence in context: Enhancing students' practical intelligence for school. In K. McGilly (Ed.) Classroom lessons. Integrating cognitive and classroom practice. (pp. 105-127). Cambridge, MA: MIT Press.

Goleman, D. (1995). Emotional intelligence. New York: Bantam Books.

Goodlad, J. (1984). A place called school: Prospects for the future. New York: McGraw Hill Book Company.

Gould, S. J. (1981). The mismeasure of man. New York: W. W. Norton.

Griss, S. (1994). Kinesthetic learning in the classroom. Educational Leadership, 5, 77-80.

Guilford, J. P. (1967). The nature of human intelligence. New York: McGraw-Hill.

Guskey, T.R. (1994). Making the grade: What benefits students? Educational Leadership, 52, 14-20.

Harris, P. (1995). Technos interview: Howard Gardner. Technos, 4, 4-7.

Herman, J. L., Aschbacher, P.R., & Winters, L. (1992). A practical guide to alternative assessment. Alexandria, VA: Association of Supervision and Curriculum Development.

Herman, J. L., & Winters, L. (1994). Portfolio research: A slim collection. Educational Leadership, 52, 48-55.

Herrnstein, R. J., & Murray, C. (1994). The bell curve. New York: The Free Press.

Hilliard, A. G., III. (1990). Back to Binet: The case against the use of IQ tests in the schools. Contemporary Education, 61, 184-189.

Humphrey, N. K. (1976). The social function of the intellect. In P. G. Bateson and R. A. Hinde (Eds.), Growing points in ethology (pp. 101-135). Cambridge, England:Cambridge University Press.

Jensen, A. R. (1969). How much can we boost IQ and scholastic achievement? Harvard Educational Review, 39, 1-123.

Kornhaber, M., & Krechevsky, M. (1993). Multiple intelligences: Theory and implications. Paper presented for Mind Management 2000 Conference, Cambridge, MA.

- Kornhaber, M., Krechevsky, M., & Gardner, H. (1990). Engaging intelligence. Educational Psychologist, 25 (3&4), 177-199.
- Kovas, M. A. (1993). Make your grading motivating: Keys to performance-based evaluation. Quill and Scroll, 68, 10-11.
- Krechevsky, M., & Kornhaber, M. (1993). Expanding definitions of learning and teaching: notes from the M.I. underground. Draft chapter for P. Cookson. (Ed.), Creating school policy: Trends, dilemmas and prospects, July, 1-35.
- Krippendorft, K. (1980). Content analysis: An introduction to its methodology. Beverly Hills, CA: SAGE Publications.
- Lavrakas, P. J. (1987). Telephone survey methods, sampling, selection, and supervision. Beverly Hills, CA: SAGE Publications.
- Lazarsfeld, P. F., & Seiber, S. D. (1964). Organizing educational research. Englewood Cliffs, NJ: Prentice-Hall.
- Lazear, D. (1991). Seven ways of teaching. Palatine, IL: Skylight Publishing.
- LeCompte, M. D., & Goetz, J. P. (1982). Problems of reliability and validity in ethnographic research. Review of Educational Research, 52, 31-60.
- Marzano, R.J., Pickering, D., & McTighe, J. (1993). Assessing student outcomes. Alexandria, VA: Association for Supervision and Curriculum Development.
- Matthews, D. (1988). Gardner's multiple intelligences theory: An evaluation of relevant research literature and a consideration of its application to gifted children. Roeper Review, 11, 100-104.
- McClelland, D. C. (1973). Testing for competence rather than "intelligence".

American Psychologist, 28, 1-14.

McKim, R. (1980). Experiences in visual thinking. Monterey, CA: Brooks/Cole Publishing.

Miller, R. (1990). The roles of language and learning in the development of literacy. Topics in Language Disorders, 10, 1-24.

Morgan, H. (1996). An analysis of Gardner's theory of multiple intelligences. Roeper Review, 18, 263-269.

Neisser, V. (1979), The concept of intelligence. Intelligence, 3, 217-227.

Nelson, J. (1996). Positive discipline. New York: Ballantine Books.

Oreck, B. (1996, July). Multiple intelligences from the perspective of arts connection. Paper presented at the Harvard Project Zero Institute, Boston, MA.

Patton, M. Q. (1980). Qualitative evaluation methods. Beverly Hills, CA: SAGE Publications.

Payne, D.A. (1974). The assessment of learning. Lexington, MA: Heath.

Piaget, J. (1952). The origins of intelligence in children. New York: International Universities Press.

Piaget, J. (1951). Play, dreams, and imitation in childhood. New York: Norton.

Reynolds, C. R., & Kaufman, A. S. (1985). Clinical assessment of children's intelligence with the Weschler Scales. In B. Wolman (Ed.), Handbook of intelligence (pp. 601-661). New York: Wiley.

Santrock, J. W. (1990). Children (Second ed.). Dubuque, IN: Wm. C. Brown.

Seeley, M. M. (1994). The mismatch between assessment and grading.

Educational Leadership, 52, 4-6.

Seigler, R. S., & Richards, D. D. (1982). The development of intelligence. In R. J. Sternberg (ed.), Handbook of human intelligence (pp. 897-971). Cambridge, England: Cambridge University Press.

Sillick, A. (1996). Movement, music, and learning: The musical and bodily-kinesthetic intelligence. The NAMTA Journal, 21, 81-96.

Smagorinsky, P. (1991). Expressions: Multiple intelligences in the english class: Theory and research into practice. Urbana, IL: National Council of Teachers of English.

Small, M. (1990). Cognitive development. San Diego, CA: Harcourt Brace Jovanovich.

Snyderman, M., & Rothman, S. (1987). Survey of expert opinion on the intelligence and aptitude testing. American Psychologist, 42, 137-144.

Spearman, C. (1927). The abilities of man: Their nature and measurement. New York: McMillan.

Spearman, C. (1904). General intelligence, objectively determined, and measured. American Journal of Psychology, 15, 201-293.

Sternberg, R. J. (1981). Evolution of theories of intelligence. Intelligence, 5, 209-230.

Sternberg, R. J. (1985). Beyond IQ: A triarchic theory of human intelligence. New York: Cambridge University Press.

Sternberg, R. J. (1986). The future of intelligence testing. Educational

Measurement: Issues and practice, 5, 19-22.

Sternberg, R. J. (1988). The triarchic mind: A new theory of intelligence. New York: Viking.

Sternberg, R. J. (1994). Diversifying instruction and assessment. Educational Forum, 59, 47-52.

Sternberg, R. J., Conway, B. E., Ketron, J. L., & Bernstein, M. (1981). People's conceptions of intelligence. Journal of Personality and Social Psychology, 41, 37-55.

Stiggins, R.J. (1994). Student-centered classroom assessment. New York: Longman.

Sudman, S., & Bradburn, N. (1974). Response effects in surveys: A review and synthesis. Chicago, IL: Aldine Publishing Co.

Sugarman, S. (1989). Piaget's construction of the child's reality. New York: Cambridge University Press.

Teele, S. (1996). Redesigning the educational system to enable all students to succeed. NAASP Bulletin, 80, 65-75.

Terman, L. M. (1919). The great conspiracy. Boston, MA: Houghton Mifflin.

Thurstone, L. L. (1938). Primary mental abilities. Chicago, IL: The University of Chicago Press.

Vaurus, L. (1990). Put portfolios to the test. Instructor, 8, 48-53.

Wagner, R. K., & Sternberg, R. J. (1984). Alternative conceptions of intelligence and their implications for education. Review of Educational Research, 54, 179-223.

Walters, J. M., & Gardner, J. (1985). The development and education of intelligence: Essays on the intellect. Washington, DC: Curriculum Development Associates.

Weinberg, R. A. (1989). Intelligence and IQ. American Psychologist, 44, 98-104.

Weinreich-Haste, H. (1985). The varieties of intelligence: An interview with Howard Gardner. New Ideas in Psychology, 3, 47-65.

Weschler, D. (1944). The measurement of adult intelligence. Baltimore, MD: Williams and Wilkins.

Wiggins, G. (1989). Teaching to the authentic test. Educational Leadership, 48, 121-127.

Appendix A

PRINCIPAL LETTER AND CONSENT FORM

Dear _____,

I am a doctoral student at Lehigh University and my research concerns Howard Gardner's theory of multiple intelligences. The title of my thesis is Investigating commonalities among elementary schools that have implemented the theory of multiple intelligences: A Guideline for the 21st century. As the title infers, my interest is to examine a multitude of schools that have been using this theory to ascertain how principals, teachers, students, and parents have responded to an environment where multiple intelligences were integrated. The purpose of my study will be to determine the commonalities among those elementary schools that have been implementing the theory of multiple intelligences so that a guideline can be created for schools for future practice.

Your school has been identified as a school that has been implementing multiple intelligences over a period of three years. Your insights, ideas, and comments will be extremely beneficial to my research. Being cognizant of your busy schedule, I have designed a questionnaire that can be completed over the phone. This phone interview should take no more than 30 minutes of your time.

Please be assured that your comments will remain confidential and anonymous and will be used for this doctoral thesis only. The possible risks associated with this research project may be inconvenience or added stress to complete the questionnaire. Your insights regarding your school's experience with multiple intelligences will not only make a contribution to my doctoral research, but also more importantly, the end results hopefully will be useful to future educators. Your participation is voluntary and you are free to withdraw from this research project at any time without jeopardizing your relationship with Lehigh University or with your employer. If you have any questions regarding this study, please feel free to contact me at (215) 297-8834. Any problems that may result in your participation in this study may be reported to Ruth Tallman, Office of Research and Sponsored Programs, Lehigh University, (610) 758-3024.

I will be calling you next week to set up a phone interview time that is most convenient for you. If you would like, I can forward the survey to you prior to our scheduled phone

Principal Letter and Consent Form
Page 2

appointment so you can familiarize yourself with the questions. I thank you in advance for your cooperation with this matter and I look forward to speaking with you shortly.

Very truly yours,

Andrea G. Weiner

Appendix B

PRINCIPAL TELEPHONE INTERVIEW GUIDE SURVEY

Date _____
School _____
Person Interviewed _____

(Telephone script to be used as an introduction to questionnaire)

Hello. I am calling from Lehigh University. I am a doctoral student doing my thesis on identifying commonalities among those schools that have implemented the theory of multiple intelligences. Your school's input on this survey will aid my research on developing a guide for future educators who are contemplating the implementation of MI into their schools. My questionnaire should take no more than 30 minutes. Your comments and insight will remain confidential and anonymous and will be used for this doctoral thesis only. May I ask you the questions?

My first question asks you about how MI first got introduced into the school.

1. Was the introduction of Gardner's theory of MI
 - (a) principal generated
 - (b) teacher(s) generated
 - (c) both (a) and (b)
 - (d) other _____
2. What circumstances led to the consideration of implementing MI theory into your school?

3. From your vantage point, what are the main strengths of MI curriculum implementation?

4. What are the staff development and teacher collaboration opportunities for the teachers regarding MI implementation?

5. What type of assessment approaches does your school employ?

6. If your school utilizes portfolio assessment, how has it worked with MI implementation?

7. Does your school district/state have various grade level standardized assessment tests? If so, how has the MI based curriculum met those standards being assessed?

8. How does MI theory align with the district's planned curriculum guide?

9. The following statements relate to the students in regard to MI. Please choose_ the response that is closest to your opinion:

Discipline problems are lower due to MI theory incorporation in school.

- (a) Definitely agree
- (b) Probably agree
- (c) Neither agree or disagree
- (d) Probably disagree
- (e) Definitely disagree

10. Student enthusiasm about learning has increased with the incorporation of MI theory in the school.

- (a) Definitely agree
- (b) Probably agree
- (c) Neither agree or disagree
- (d) Probably disagree
- (e) Definitely disagree

11. Does your school have any guidelines for new teachers involving instructional methods or curriculum approaches? If so, what are they?

12. What are the weaknesses of MI theory curriculum implementation?

13. If a new school was going to implement this theory, knowing what you know today, what are the ingredients for successful implementation?

14. What do you predict regarding the future of MI in the schools?

Demographics regarding the school

Student ethnic population:

_____ % Caucasian
_____ % African-American
_____ % Hispanic
_____ % Pacific-Rim
_____ % Native-American
_____ % Other ()

Family SES level:

_____ % Upper Class
_____ % Upper-middle class
_____ % Middle-middle class
_____ % Lower-middle class
_____ % Lower class
_____ % on free or reduced lunch

Brief description of surrounding community

Total student population_____

Total teacher population_____

Is MI school-wide? Y____N____

Is MI implemented only in some classes? Y____N____ If yes, how many
classes?_____

The year school began implementing MI_____

TEACHER SURVEY LETTER

Dear _____,

I am a doctoral student at Lehigh University currently working on my dissertation. My thesis is on investigating commonalities among schools that have implemented the theory of multiple intelligences. After speaking with your principal,

_____, he/she has selected you to work with me in completing this questionnaire. The goal of this questionnaire is to gain insight from a teacher's perspective on how the theory of MI affects students, parents, and teachers. Your input with this will greatly aid my research for developing a guideline for future teachers who are contemplating the implementation of MI in their schools. I have designed a questionnaire with a busy teacher in mind so that it should take no more than 20-30 minutes to complete.

Your comments and insight will remain confidential and anonymous and will be used for this doctoral thesis only. The possible risks associated with this research project may be inconvenience or added stress to complete the questionnaire. Your participation is voluntary and you are free to withdraw from this research project at any time without jeopardizing your relationship with Lehigh University or with your employer. If you have any questions regarding this study, please feel free to contact me at (215) 297-8834. Any problems that may result in your participation in this study may be reported to Ruth Tallman, Office of Research and Sponsored Programs, Lehigh University, (610) 758-3024.

Please return the completed questionnaire within one week in the self-addressed, stamped envelope provided. In recognition of how valuable a teacher's time is in light of the myriad of all the activities that encompass your day, I would like to send you a copy of *Awakening the Genius in the Classroom* by Thomas Armstrong, for assisting me with this questionnaire. Please fill out the attached mailing label found at the end of the

Teacher Survey Letter
Page Two

questionnaire with your name and address so that the book can be sent to you. This is a token of my appreciation for your input, candor, and help in impacting research on MI theory.

Thank you for your time and honesty.

Sincerely,

Andrea G. Weiner

Address where book can be sent:

TEACHER QUESTIONNAIRE

Name _____
Date _____
School _____

If applicable, please answer the following questions. **YOU MAY HAVE MORE THAN ONE ANSWER FOR EACH QUESTION.** Your comments and insight will remain confidential and anonymous and will be used for this doctoral thesis only.

1. Why have you incorporated the theory of multiple intelligences in your classroom?

2. What role have the teachers in your school played in developing a program centered around MI theory?

3. What type of ongoing planning time and/or teacher development do you receive to coordinate your MI ideas regarding curriculum with other teachers?

4. With the eight different intelligences, which of the following instructional methods do you employ to reflect MI in your classroom?

- (a) self-directed student projects
- (b) apprenticeships
- (c) MI learning stations
- (d) workbooks
- (e) computer assisted instruction
- (f) other

5. Does MI theory implementation address your district's planned curriculum guide? If yes, in what ways?

6. If your school utilizes portfolio assessment, how has it worked with MI implementation?

For each of the following eight intelligences, please list **two** successful instructional strategies and **two** assessment approaches:

- (a) ***Spatial Intelligence*** -
Instructional strategies:

(1) _____

(2) _____

Assessment Approaches:

(1) _____

2) _____

(b) **Linguistic Intelligence** -
Instructional strategies:

(1) _____

(2) _____

Assessment Approaches:

(1) _____

(2) _____

(c) **Kinesthetic Intelligence** -
Instructional strategies:

(1) _____

(2) _____

Assessment Approaches:

(1) _____

(2) _____

(d) ***Musical Intelligence*** -
Instructional strategies:

(1) _____

(2) _____

Assessment Approaches:

(1) _____

(2) _____

(e) ***Interpersonal Intelligence*** -
Instructional strategies:

(1) _____

(2) _____

Assessment Approaches:

(1) _____

(2) _____

(f) **Logical - mathematic Intelligence -**

Instructional strategies:

(1) _____

(2) _____

Assessment Approaches:

(1) _____

(2) _____

(g) **Intrapersonal Intelligence -**

Instructional strategies:

(1) _____

(2) _____

Assessment Approaches:

(1) _____

(2) _____

(h) **Naturalistic Intelligence** -
Instructional strategies:

(1) _____

(2) _____

Assessment Approaches:

(1) _____

(2) _____

8. The implementation of MI theory affected student learning

- (a) understanding has increased
- (b) understanding has decreased
- (c) understanding has stayed the same
- (d) not applicable

9. Which specific intelligence(s) has affected student learning the most?

10. How has student enthusiasm within your room been influenced by the incorporation of MI?

- (a) higher level of participation
- (b) increased displayed excitement about learning
- (c) willingness to complete projects
- (d) increased student attendance
- (e) no change
- (f) other

11. How have students' social skills been influenced since the implementation of MI into the classroom? Please circle one of the highlighted words in a-c:

- (a) students work **better/worse** cooperatively
- (b) studen(ts can handle conflicts among each other **more/less** effectively
- (c) sensitivity towards others has **increased/decreased**
- (d) no change
- (e) other

12. How has MI theory influenced discipline problems in your room?

- (a) problems have *significantly decreased* since implementation
- (b) problems have *slightly decreased* since implementation
- (c) problems have *significantly increased* since implementation
- (d) problems have *slightly increased* since implementation
- (e) no impact on discipline problems in my room

Explain

13. Parents are educated about MI through:
- (a) Teacher/parent conferences
 - (b) Classroom or school newsletters
 - (c) Parent participation in the classroom
 - (d) Other

Which one(s) has been most effective?

14. The incorporation of MI in the classroom has had the following effect(s) on parents: Please circle choice from the highlighted words in a-c.
- (a) **Increased/decreased** awareness of different types of intelligence
 - (b) **Increased/decreased** appreciation of different types of intelligence
 - (c) **Increased/decreased** labeling of own child due to MI intelligence categories
 - (d) No change

15. What advice would you now give a teacher who is planning to incorporate MI in his/her classroom?

Demographics regarding the classroom and teacher

Total number of students in classroom _____

How many teachers (aides included) in the classroom? _____

How long has the teacher been in the teaching profession? _____

How long has the teacher been teaching this particular grade? _____

How long has the teacher been at this particular school? _____

The number of years implementing MI in the classroom _____

Appendix E

CLASS OBSERVATION SITE VISIT SHEET

School _____
Date _____
Class _____ Grade _____

Lesson Plan Objective:

Instructional Methodology used:

Intelligences observed:

Done in: Groups Y N Whole Class Y N Individual Y N
Other _____

Student Reaction 0 1 2 3 4 5 Student Participation 1 2 3

Assessment used for lesson:

Additional comments on lesson:

Physical setting of classroom

How is MI reflected in the classroom?

Type of furniture layout (desk formation):

Describe classroom (decor, walls, computers, windows, size, materials, etc.)

Teacher-student interaction: Positive Negative Why?

Types of instructional methods observed:

- a. Self-directed student projects
- b. MI learning stations
- c. Workbooks
- d. Computer assisted instruction
- e. Other

Comments:

Appendix F

TEACHER SITE VISIT INTERVIEW SHEET

Grade _____ Teacher's Initials _____

Years in teaching profession _____

Years teaching this grade _____

How do you assess student's strength intelligence?

Do you know what your dominant intelligences are?

Does it reflect in your development of lesson plans in curriculum?

Describe how you collaborate with other teachers regarding curriculum issues. Are there grade level teams? Is there cross grade level sharing?

Why do you personally like using MI in the classroom?

What is your philosophy about teaching? Does the incorporation of MI in the classroom reflect your philosophy on teaching?

Are there parent conferences? How many during the year? What is shared during this conference?

What are the drawbacks (if any) to MI in the classroom?

What advice would you give to other teachers who are just beginning with MI?

Appendix G

PRINCIPAL SITE VISIT INTERVIEW SHEET

School _____

1. Total number of students for 1999-2000 _____

2. Describe the community where it is located:

3. Socio-economic background of students:

4. Ethnic background of students:

5. Number of f/t teachers: _____

6. Number of specialty teachers: _____

Positions: _____

7. Number of p/t or aides: _____

8. Number of administrative staff: _____

Positions: _____

9. How long has principal been at school? _____

10. Did principal introduce or was very involved in implementing MI in school?

11. What is the school's mission statement?
12. Are district office and Board of Education supportive of their MI curriculum?
13. What adjectives would you use to describe your staff?
14. How would you characterize your leadership style?
15. What is the mix of new teachers to more experienced teachers?
16. Describe your gifted and special ed. programs:
17. Describe staff planning time for curriculum:
18. Does school use themes for learning units? Who decides? What are some of the themes used?
19. Types of assessments used:
20. Due to the personal intelligence, are students here more sensitive to one another, able to show compassion, and find it easier to resolve conflicts?

21. Describe parent- school involvement:

22. What advice would you give to principals thinking about implementing MI in their schools?

Additional Comments:

Appendix H

Below is a list of materials that will assist in creating a Flow environment. The list is to serve as a resource, not a mandate to purchase.

Games:

Mastermind (junior and adult version)	Rummikub
Abalone	Guess Who
Trivial Pursuit Junior	Boggle (junior and adult version)
Checkers	Chess set
Outburst Jr.	Jengaa
ASAP	Brain Storms
Pictionary	Scrabble Jr.
Dominoes	Tan Trix
30 Second Mysteries	Clue
SET	Tri Bond
Memory	Brain Bogglers

Puzzles:

Jigsaw puzzles (maximum 100 pieces)	Hidden pictures (K-4th)
20 Questions	Mind Trap
Brain Quest Cards (& computer)	Stark Raving Cubes
Symbol Simon	Tangrams
Snafooz	Bandu
Travel Triazzle	Lunch Box Library
Squizzle Puzzle Packs	5 minute mysteries

Spatial:

Floor puzzles
Octons
Marble Works
Kinex
Legos
Building blocks (large wooden type)
Lincoln Logs
3-dimensional puzzles (45-60 pieces) *
Puzzellations (3-D tessellations)
Art supplies (see additional detailed list)
Stencil

Books:

Flow: The psychology of optimal experience, by Mihaly Csikszentmihalyi
Dictionary
Thesaurus
Eyewitness books
*Mensa Mind Benders (multi-age editions) ***
Hidden picture books
Math puzzlers
*World's Best Optical Illusions ** - Charles Paraquin*
How Do They Do That - Caroline Sutton
Clue paperbacks
*Plexers and More Plexers ***
Quicksolve Whodunit Puzzles - Jim Sukach
Brainquest: Science, Math, Geography editions
World Almanac For Kids 1999 Edition
Dr. Doo Riddles
Books of mazes
Great Book of Whodunit Puzzles - Falcon Travis
Do Penguins Have Knees? David Feldman
Imponderables - David Feldman
Math Wizardry for Kids - Margaret Kenda & Phyllis Williams
100 Numerical Games - Pierre Berloquin
100 Perceptual Puzzles - Pierre Berloquin
100 Games of Logic - Pierre Berloquin
Mega-Fun Math Games - Dr. Michael Schiro
Mad Mysteries Series David LaRochelle
Motel of the Mysteries - David Macaulay
Adventures in the Solar System (Planetron and Me)
by Geoffrey Williams and Dennis Regan (cassette included for listening center)
Super Flyers - Neil Francis
Amazing Science Experiments with Everyday Materials - E. Richard Churchill
Detective Club Puzzlers: Solve It Yourself
Mysteries by Hy Conrad and Bob Peterson
Codemaster Books (How to write and decode messages) - by Marvin Miller
Free Stuff for Kids - (current issue) Meadowbrook Press
Games Magazine subscription
*Games Magazine Riddlers Books: Karen C. Anderson ***
*Games Magazine Kids= Big Book of Games: Karen C. Anderson ***
*Games Magazine Kids= Giant Book of Games: Karen C. Anderson ***
*Mensa: Word Games For Kids (ages 8 and up) ***
*Mensa: The Ultimate Mental Challenge ***

*Mensa: Mind Games For Kids ***

*** Excellent books to replicate for centers/activities*

VITA

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EXPERIENCE

- 1999 – Present Consultant:
Educational consultant for KinderWorks, Inc.
responsible for development of social/emotional
pre-school programs for ages 3 – 6.
- Development and design of Buckingham Friends
School (BFS) Social Emotional Educational
Curriculum (S.E.E.C.) program for grades K-8.
- 1/91 – 5/91 The Hun School, Princeton, NJ
Internship in the middle school responsible for
educational administrative duties, grades 5-7.
- 9/89 – 1/91 Country Day School, Quakertown, PA
Designed and implemented self-esteem classroom
workshops for ages 7 – 13.
- 1988 – 1991 Managed Care Associates, Inc., Carversville, PA
Senior Vice President
Provided a comprehensive evaluation and study of
General Motors Corporation \$3 billion annual
expenditure on healthcare benefits. Prepared
evaluations and made recommendations for
improvements, continuance or severance of 123
HMOs.
- 1979 – 1985 U.S. Healthcare, Inc., Blue Bell, PA
Vice President of Provider Relations
Liaison for office-based participating physicians
and USH corporate. Supervised 50 staff members,
developed physician networks in FL, NJ, NY and

IL. Designed and implemented capitation programs for mental health, podiatry, and radiology.

1975 – 1979

Hahnemann Community Mental Health Center,
Phila, PA

Child Psychotherapist

Facilitated group, individual and family therapy for ages 3 – 16. Developed community school liaison program with mental health center. Developed and executed a pilot prevention program for at risk siblings of troubled families. Supervised child psychiatry residents.

EDUCATION

B.S. – Mental Health Technology

1975, Hahnemann Medical College
Phila., PA

M.A. – Educational Administration

1991, Rider University, Lawrenceville, NJ

E.d.D. – Doctor of Education

June 2001, Lehigh University, Bethlehem,
PA