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The Relationship Between Teacher Efficacy and Multiple Learning Competencies with Arts and Non-Arts Educators

Lavinia Hallowell Draper
Lynn University

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THE RELATIONSHIP BETWEEN TEACHER EFFICACY AND MULTIPLE LEARNING COMPETENCIES WITH ARTS AND NON-ARTS EDUCATORS

Lavinia Hallowell Draper, Ph.D.
Lynn University, 2009

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Dissertation
Presented in Partial Fulfillment of the Requirements for the Degree of
Doctor of Philosophy
Lynn University

The Relationship between Teacher Efficacy and Multiple Learning Competencies with
Arts and Non-Arts Educators

By
Lavinia Hallowell Draper

Lynn University

November 8, 2009
Abstract

The National Commission on Excellence in Education (1983) published *A Nation at Risk* to relay the academic performance level of American students. The results revealed that Americans students were performing considerably below other countries. Consequently, accountability through testing became the focus for policy makers to promote educational reform and educational equality (Linn, 2000). The focus on testing, however, has hindered student achievement and led to more (a) social promotion; (b) remedial courses; (c) retention rates; (d) teachers leaving the field; (e) dropout rates; and (f) invalid achievement results (Hoffinan, 2001).

As more schools have reassigned staff members to meet the demands of testing and have altered the school curriculum to cover the academic standards being tested, art programs and teachers have been removed from schools across the nation. The elimination of the arts in the curriculum, nevertheless, has not proven to be a remedy for improving student achievement. The average reading score for fourth and eighth graders has only increased by two points, since 2005 and four points compared to the first assessment 15 years ago (National Assessment of Educational Progress, 2007).

The literature review on the impact of the arts on learning clearly supports the implementation of the arts to improve student achievement and the overall quality of education. The results of one particular research study at UCLA revealed that students involved in the arts were more successful in school than those who were not involved (Caterall et al., 1999).

The theory of multiple intelligences (Gardner, 1999) encompassed the essence of the creative genius of artists. People were more inclined to learn when involved in an
activity for which they have talent due to the arts: (a) providing powerful points of entry; (b) offering models; and (c) providing multiple representations of the central idea (Gardner, 1999).

The gap in the literature suggested that researchers had not explored the impact that the multiple intelligences of teachers had on the effectiveness of learning, which in turn, could raise student achievement. The purpose, therefore, of this non-experimental study was to examine whether the multiple intelligences of art and non-arts teachers, measured by the Multiple Intelligences Test (Chislet & Chapman, 2005), impacted teachers’ perceptions of teacher efficacy, measured by the Teachers’ Sense of Efficacy Scale Test (Tschannen-Moran & Hoy, 2001).

The accessible population was Palm Beach County K-12 teachers who responded to the surveys online. The researcher ran the following statistical tests into the Statistical Package for the Social Sciences (SPSS) Version 14.0: (a) Cronbach’s Alpha to determine the reliability estimates; (b) Pearson’s Chi-Square Test to observe frequency distributions; (c) Correlation Matrix to determine the degree of the relationship between groups; (d) Multiple Regressions to ascertain the criterion-related validity; (e) ANOVAS to establish the means of each group; and (f) t tests to establish whether the difference of the means were statistically significant.

The outcomes of the study will provide additional information for the body of research that supports the inclusion of the arts as an indispensable element of the school’s curriculum for (a) raising the quality of instruction and (b) providing a more equitable education for American students.
ACKNOWLEDGEMENTS

I would like to first thank my family for their support with allowing me to devote the time and resources to this research project. Also, I would like to acknowledge my professors, Dr. Andreas and Dr. Kosnitzky, who encouraged me to persevere and shape my research into a true reflection of both my passion for the arts and quest to determine the relationship between artistic thinking and student achievement. Above all, I would like to recognize my colleagues, students and daughter, Valentina, who challenged me to seek alternative ways of instruction to meet their diverse learning styles.
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CHAPTER I
INTRODUCTION TO THE STUDY

Introduction and Background to the Problem

Public schools are under enormous pressure to increase student achievement under the NCLB Act of 2001, which caused damaging tension in schools (Klein and Zevenbergen, 2006). The primary goal of NCLB was to close the achievement gaps between (a) economically disadvantaged students with students from higher socio-economic backgrounds; (b) major racial and ethnic subgroups; (c) students with disabilities with those without; and (d) limited English proficient students with those whom were proficient (Linn, 2006). Schools are required to make Adequate Yearly Progress (AYP) by raising the achievement levels of eight student subgroups to a state-determined level of proficiency. The student subgroups included all students who were (a) Caucasian; (b) African American; (c) Asian; (d) Hispanic; (e) Native American; (f) Limited English Speaking (LEP); (g) low-income; and (h) special education students.

The NCLB goal was for all students to reach the proficiency level or higher in math and reading by the 2013-2014 school year (Linn, 2006). Annual Measurable Objectives (AMOs), determined every year between 2002 and 2014, defined the performance targets that had to be met by schools in order to make (AYP). The repercussions for schools that do not make AYP were: (a) the mandatory replacement of school personnel; (b) implementation of new curriculum; (c) placement of outside advisors to the school; (d) year-long school programs; and (e) the possibility of privatizing public education (Linn, 2006).
Tests by themselves cannot produce the desired improvement to schools because assessments do not deal with matters of teacher effectiveness or student motivation. The most detrimental aspect of the testing movement has been that the time spent on test-taking preparation overemphasized basic skills and neglected higher-order thinking skills (Stiggins, 1999).

**History of Standardized Testing**

The history of standardized achievement tests in the United States began with the Thorndike Handwriting Scale in 1909 (Klein & Zevengergen, 2006). Once the discontent with public education began in the 1960’s, the Elementary and Secondary Education Act of 1965 became a federal law which allowed the federal government to provide more funding to school districts as a solution to improving public education. Minimum competency assessments, which focused on low-level skills and knowledge, began in the 1970’s to measure educational outcomes (Klein & Zevengergen, 2006).

State-mandated achievement tests have grown at an exponential rate over the past two decades from fewer than a dozen states in 1980 to nearly every state in the U.S. by the year 2000 (Hoffman, 2001). Subsequently, accountability through testing has become the focus for policy makers searching for ways to promote educational reform, and thus becoming the public objective for educational equality (Linn, 2000). The three main test publishing companies are: (a) McGraw Hill; (b) Houghton-Mifflin; and (c) Harcourt General (Flores, 2003). Schools and neighborhoods are ranked based on single test results, thus perpetuating the need for schools and teachers to focus even more on test results.
Standardized tests are intended to measure learning outcomes and skills that are common to the curriculum in schools and school districts (Klein & Zevengergen, 2006). Standardized tests, when used appropriately, help teachers identify student strengths and weaknesses (McMillan, 2000). A test, nevertheless, is only constructive in educational terms if: (a) the objectives are clearly outlined in advance; and (b) the curriculum is designed around those objectives (Rubenstein, 2003). These high-stakes testing procedures are used as a tool to measure student knowledge and the effectiveness of instruction.

Schools have evolved over the millennia throughout the world with the exclusive purposes of: (a) transmitting civic and moral virtues; and (b) training individuals to exercise their knowledge of culture through written and numerical systems (Gardner, 1997). The flourishing operation of a particular society has been built upon a rejuvenated group of people who effortlessly (a) read key texts; (b) transcribe information into written form; and (c) perform mathematical operations required for both accounting and commercial purposes (Gardner, 1997).

Biologists have remained skeptical about providing a straightforward biological account of intelligence. The reasons for the disparity in student achievement may be attributed for the following reasons: (a) scientists have sampled only a small number of possible human environments; and (b) adopted children are brought up in families that are similar to the ones into which they were born (Gardner, 1977).

"Most scientists spurn any discussion of possible racial or ethnic differences in intelligence because the mechanisms that mediate differences in test scores observed within groups cannot be equated with mechanisms that may mediate differences across
groups" (Gardner, 1977, p. 40). The reasons why African Americans typically scored one deviation lower than Caucasian Americans had little or nothing to do with genes, and more to do with (a) latent or overt racism; (b) diverse cultural attitudes; (c) distinct practices; and (d) diverse opportunities (Gardner, 1977).

**Apparent Decline in American Education**

The decline in American education began in 1963 with the decrease in recorded student test scores from the Scholastic Aptitude Test (SAT) (Eisner, 1982). From 1963 to 1977, there was a decline of 49 points in verbal scores and 31 points in mathematical scores, thus indicating that the decline in SAT scores became an early sign that the quality of schooling in The United States was falling (Eisner, 1982). Declines also occurred in: (a) the American College Testing Programs; (b) the Minnesota Scholastic Achievement Test; (c) tests used by the National Assessment of Educational Progress; and (d) the Comprehensive Tests of Basic Skill (Eisner, 1982).

Students’ ability to read, write and compute (the three R’s) was not as strong as it was once was, nor as good as it could be. The solution was to return “back to the basics” at both the elementary and secondary levels of schooling (Eisner, 1982). The “back to basics” became a slogan in the field of education that gained popular support, forcing educators to move backward rather that forward (Eisner, 1982). The belief was that educators had neglected the three R’s in the 1960’s and 1970’s in which educational innovations, such as the new math, the Title II of the Elementary and Secondary Education Act, and the belief that the classroom should be more democratic, ignited across the country (Eisner, 1982).
Since the early 1960's, American educators in the behaviorist branches of psychology were especially interested in developing a way to control and measure student behavior and performance (Eisner, 1982). The notion behind this belief was that similar types of results found in the areas of medicine and engineering could be applied to education by simply adopting the terminology behind the fields. Terms such as "prescription," "diagnosis," "entry behavior," and "exit skills" could provide new perspectives to old problems. The focus shifted from the quality of teaching practices to the development of new techniques for purposes of management and control (Eisner, 1982).

The issue of addressing educational concerns, originating from other fields, had a profound effect on the educational research community (Eisner, 1982). Researchers began to find techniques that could effectively produce the desired effect by using certain "objectives" as means for demonstrating success behind the newly chosen technique (Eisner, 1982). Focusing too much attention on the achievement of certain goals through the use of techniques neglected attending to the consequence and negative side effects that these techniques might have produced in the first place (Eisner, 1982). "When the demands for results become too great, the temptation to use whatever is expedient is even greater" (Eisner, 1982, p. 8).

The publication of A Nation at Risk (National Commission on Excellence in Education, 1983) ignited mandatory testing as Americans learned that students were performing substantially below students from other countries in both reading and math. The standards-based movement, consequently, was designed to: (a) raise the bar on student achievement; (b) improve instruction; (c) increase test scores; and (d) enhance
school accountability (Klein & Zevengergen, 2006). The result was that standards-based instruction produced drastic changes in testing frequency and design. Before the standards-based instruction movement, students were tested once every three to four years between grades four and 12 (Klein & Zevengergen, 2006).

The problem in standards-based instruction occurred when the interest shifted from ranking students to determining learning gains, since the conclusions did not rely on the comparison of performance with other students (Koretz, 2005). The sampling principle, used to make inferences concerning the results from large-scale assessments, determined the generalizations from the tested samples to the domains from which the items were sampled (Koretz, 2005).

The process of evaluating whether students have met performance standards involved drawing inferences about either (a) the absolute level of performance; or (b) the size of the gain in performance (Koretz, 2005). The result of making score-based inferences from tested sample items that were unrepresentative of the total domain of skills being tested was invalid representations of both (a) levels of proficiency; and (b) adequate learning gains. Consequently, score inflation transpired when the augment on tested items did not represent an increase in performance on the various factors given considerable weight by those using the scores to determine student achievement (Koretz, 2005).

**Effects of Standardized Testing**

The effects of the testing era of the 21st Century and the pressure from politicians, school district personnel, and administrators have encouraged many teachers to employ negative test preparation practices that were clearly not in the best interest of children
Examples of unconstructive test preparation activities included: (a) relentless drilling of test content; (b) eliminating curricular content not covered by the test; and (c) extensive practice sessions that incorporate similar test items to the actual test. Although the types of test preparation strategies mentioned above might raise student test scores, they would not necessarily change or enhance learning (Volante, 2006). This form of instruction becomes known as “item-teaching” or the narrowing of the curriculum to match only the items found on standardized tests (Popham, 2001).

According to Eisner (1982), the use of test scores today is the antithesis of the true purpose for assessment instruments. The original purpose of test scores was to establish educational goals. The standard procedure for using tests in educational practices was to sequentially: (a) establish the educational objectives; (b) design a series of curriculum activities related to those objectives; (c) implement the activities through teaching; and (d) evaluate whether or not the objectives were met through testing the original objectives (Eisner, 1982).

The use of tests and the publication of their results described and prescribed information to educators and the public (Eisner, 1982). Tests, according to Eisner, served two functions: (a) tests described the current state of educational affairs; and (b) tests prescribed by reflecting aspects of human performance. Norm referenced tests were designed to yield a normal distribution of scores, revealing that approximately half of the students would perform below average (Eisner, 1982). For example, the normal distribution of scores demonstrated that 50% of students taking the test would score below the mean and about 25% would fall in the lowest quartile (Eisner, 1982). Tests have, therefore, become the most influential tool for shaping educational priorities and
agendas since tests called attention to students who performed below average (Eisner, 1982).

"The consequence of large-scale state-mandated testing is that their use tends to reduce the school’s prerogatives for establishing its own priorities" (Eisner, 1982, p. 15). When the locus of control originated from the results of test performance, principals and teachers: (a) lost the ability to prioritize changes based on what was suitable for students; (b) surrendered their professional autonomy; (c) jeopardized the scope of the curriculum; and (d) threatened the climate for educational innovation (Eisner, 1982).

Educators might gain insight into the some of the causes for the apparent rise in test scores and whether or not they were an accurate measure of higher levels of student learning by using Texas as a model. President Bush’s political agenda in 2002 for education reform referred to Texas as a commendable model of an accountability system that was necessary in all public schools across the nation (Flores, 2003). Policy makers were able to institute a rationale for the present national accountability mandate by placing Texas at the forefront (Flores, 2003).

However, research has clearly supported that the increase in test scores under high-stakes testing conditions should not be accepted at face value since score inflation has given the misleading illusion of progress in general (Koretz, 2005). Student gains earned on high-stakes tests were not indicative of other indicators of student achievement (Lin, 2006). Finally, school accountability results did not provide direct evidence of the effects of instructional practice (Raudenbush, 2004). Accountability, according to Raudenbush (2004), must depend on other sources of information, such as organizational and instructional practices, in order to be successful.
Further, emphasizing standardized testing and formal evaluations has had a harmful impact on intrinsic motivation (Herman, 1992). Students from diverse cultures and from low socio-economic backgrounds constitute the greatest numbers of schools where there has been the most pressure to improve test scores (Herman, 1992). In order for teachers to effectively prepare their students for standardized tests, without falling in the trap of “teaching to the test,” instruction must be directed towards the content knowledge, cognitive skills, and standards represented on a given test. This form of “test pollution” has led to (a) social promotion; (b) more remedial courses with intensive drilling of basic skills on every grade level; (c) higher retention rates; (d) an increase of teachers leaving the field; (e) greater drop-out rates; and (f) invalid achievement results (Hoffman, 2001).

Definition of Terms

**Cronbach’s Alpha** The Cronbach’s Alpha is a statistical index that measures the homogeneity of items on an instrument. It may also be used to measure the internal consistency of an exam by providing a measure of the extent to which the items on a test provide consistency regarding the learner’s mastery of the domain. The Cronbach’s Alpha ranges from 0 to 1.00, with values close to 1.00 indicating high consistency. A well-developed instrument should have internal consistency coefficients of at least .90 (Wells & Wollack, 2003)

**Descriptive Statistics** Descriptive statistics are used to (a) describe the basic features of data in a research study; (b) provide simple summaries about the sample and the measures; and (c) present quantitative descriptions in a controllable form when large amounts of data are included (Trochim, 2006).
**Florida Comprehensive Assessment Test (FCAT)** The Florida Comprehensive Assessment Test (FCAT) is part of Florida's overall plan to increase student achievement by implementing higher standards. The FCAT, administered to students in Grades 3-11, contains two basic components: (a) criterion-referenced tests (CRT), measuring selected benchmarks in Mathematics, Reading, Science, and (b) writing from the Sunshine State Standards (SSS) (Florida Department of Education).

**Multiple Intelligences** This theory of intelligence was by Howard Gardner (1983), professor at Harvard University. Gardner's definition of intelligence is "the capacity to solve problems or fashion products that are valued in one or more cultural setting." Originally, Gardner identified seven intelligences: linguistic, logical-mathematical, musical, spatial, bodily-kinesthetic, inter-personal, and intra-personal. By the 1990's, Gardner had added two more forms of intelligences including naturalist and existentialist (Gardner, 1983).

**Multiple Regression** Multiple regression (Pearson, 1908) is used to (a) predict the variance in an interval dependent, based on linear combinations of the interval or dichotomous independent variables; (b) establish that a set of independent variables may explain a proportion of the variance in a dependent variable at a significant level through a significance test of $R^2$; and (c) determine the relative predictive importance of the independent variables by comparing beta weights (Garson, 1998).

**No Child Left Behind Act** The No Child Left Behind Act of 2001 (NCLB) is a law that reauthorized the Elementary and Secondary Education Act (ESEA), affecting education from kindergarten through high school. Proposed by President Bush, NCLB was signed into law on January 8th, 2002. NCLB is built on four principles: accountability for
results, more choices for parents, greater local control and flexibility, and an emphasis on doing what works based on scientific research (U.S. Department of Education).

**Teachers' Sense of Efficacy** Teacher efficacy is defined as the teacher's belief that they (a) can have a positive affect on student learning; (b) create an environment that allows for continuous improvement; and (c) implement new programs with innovative instructional approaches. Teacher efficacy is also associated with more (a) effective uses of staff development; (b) engagement in collaborative activities; and (c) overall school improvement (Peterson & Brietszcke, 1993).

**Title I** This program provides financial assistance to schools with high percentages of poor children to help ensure that all children meet challenging state academic standards. Schools must focus Title I services on children who are failing, or most at risk of failing, to meet state academic standards. Schools in which poor children make up at least 40 percent of enrollment are eligible to use Title I funds for school-wide programs that serve all children in the school. More than 50,000 public schools across the country use Title I funds to provide additional academic support and learning opportunities to help low-achieving children master challenging curricula and meet state standards in core academic subjects (U.S. Department of Education).

**Purpose**

The purpose of this non-experimental causal-comparative study is to determine the learning competencies among non-arts and art teachers, as measured by the Multiple Intelligences Test (Chislet & Chapman, 2005). The researcher will also explore the possible relationships between certain dominant intelligences (Multiple Intelligences) and teachers' perceptions of teacher efficacy, as measured by the Teachers' Sense of Efficacy.
Scale Test (Tschannen-Moran & Hoy, 2001). Finally, the researcher will search for whether or not a correlation exists between teacher demographics and higher levels of teacher efficacy. The ultimate goal of this study is to determine which dominant intelligences have the most profound impact on teacher efficacy in the areas of (a) student engagement; (b) instructional practices; and (c) classroom management.

**Justification**

The results of this study could contribute to the vast body of research already conducted on Gardner's Multiple Intelligences and teacher efficacy. Although the components of teacher efficacy have been defined, there has been no research to date that has explored the patterns between teachers' learning competencies and the affect of them on (a) student engagement; (b) instructional practices; and (c) classroom management.

The dominant intelligences of art teachers and the subject areas of the arts require divergent thinking, which in turn, fosters creativity. Divergent thinking, however, may not be measured on standardized tests, due to the tests' limitations and the fact that only convergent thinking results in a single correct response.

If a critical component of how humans think and solve problems cannot be tested in a standardized format on a large scale, and non-art teachers are not encouraged to teach creativity problem solving, the result will be that even more students will be labeled as "failing" under the NCLB measures. Perhaps the greatest concern of all is that many more generations of young people will continue the negative pattern of student achievement with few opportunities to demonstrate their dominant intelligences and become functional contributing members of society.
The need for the reinforcement of the arts as being fundamental to academic achievement is immense. The arts facilitate more ethical teaching practices, over traditional convergent thinking preparatory practices implemented with the specific purpose of only raising test scores. More below proficiency level low socio-economic students, required by the federal and state laws to improve, will benefit both personally and academically from the expansion of art programs and practices that encourage divergent thinking practices.

**Delimitations and Scope**

The delimitations of the study are that the subjects will be limited to those arts and non-arts public school teachers who will be located in a Southeast Florida public school district, the largest in Florida and one of the most populous in the nation. The participants in this study will range from first year teachers to veteran teachers with degrees ranging from undergraduate only to doctorates. It is possible that some may be uncertified by the state of Florida, since new teachers may be granted a two-year temporary certificate to teach while working on attaining their teaching certification. Any teacher working at either a private institution or outside of the district will be excluded from the study.

The president of the district’s teacher union (The Classroom Teacher’s Association) will send a link of the online surveys to the home addresses of its union members, consisting of 5,900 members. The remaining approximately fifty participants won’t necessary be union members, however they will be employed at the district as both arts and non-arts teachers. Arts and non-arts organization leaders within the district have agreed to forward the surveys to those fifty participants. All of the participants must have
Internet access and personal e-mail accounts to complete the on-line surveys in this research study.

The scope of this research study may have a direct impact on (a) establishing the relevance of teachers' dominant intelligences on strengthening teacher efficacy; (b) determining whether patterns may exist between teacher demographics and teacher efficacy; and (c) assisting with the role of the arts as a means for raising student achievement across the nation.
Chapter 2

Literature Review

The purpose of this literature review is to examine educational theories on learning presented in the review of literature are (a) Hale; (b) Piaget; (c) Freire; (d) Williams; (e) Holmes; (f) Banks; (g) Gollnick; (h) Langer; (i) Cassirer; (j) Freud; (k) Goodman; (l) Bruner; (m) Gardner; (n) Eisner; (o) Vygotsky; (p) Heathcote; and (q) Rotter.

The models presented in the review of literature are: (a) Cognitive Styles of Learning; (b) The Decision-Making and Social Action Approach; (c) Dialogical Thinking (d) Cross-Cultural Instruction; (e) Experimental Learning; (f) Teaching for Democracy and Social Justice; (g) Value Inquiry Model; (h) Symbolic Transformation; (i) Narrative Mode; (j) Apprenticeship: The Traditional Route to Expertise; (k) Multiple Intelligences; (l) Modes of Treatment; (m) Transfer of Learning through the Arts; (n) Drama in Education Model; and (o) Social Learning Theory.

Theoretical and empirical literature related to the effectiveness of an arts-integrated student-centered approach in preparing the country's lowest readers to make learning gains, according to the requirements of the NCLB Act will also be examined. Further, classroom procedures for preparing lower performing reading students for state tests will also be analyzed in regards to how successfully students demonstrate proficiency on the state standardized test in reading. A review and analysis of the existing literature will yield identification of areas for future scholarly inquiry.
Historical Development of Educational Theories on Learning

Cognitive Styles of Learning

Culture shapes and affects people's cognitive processes, including the way in which they approach academic tasks and behave in traditional academic settings (Hale, 1982). Cognition directly concurs with life activities; therefore the study of cognitive processes must include content that is relevant to intelligence and behaviors (Cole, 1971).

Cognitive style refers to the process of utilizing one's logical skills. There are differences in the methods that learners use to select and classify information. Cohen (1969) identified two styles of learning, which are analytical and relational. The analytical style, required specifically by schools, describes how students organize information, while the relational style refers to the growth of information. Hilliard (1976) compiled a summary of the characteristics of the two learning styles by Cohen (see Figure 1).
Students who do not develop the necessary analytical skills early on in school will become poor achievers and worsen as they move on to the higher grades (Hale, 1982). Table 2 (Cohen, 1969) recapitulates the predicted achievement levels of students who function with both high and low levels of information in the analytical and relational styles of learning.
Both cognitive style-learning processes are measured by standardized tests and rewarded in schools. The overall ideology and environment in schools reinforces the behaviors associated with the analytical style of processing information. Many impoverished students from diverse backgrounds enter the classroom with a relational style of learning and are directed to think, speak, and write in an analytical one (Hale, 1982).

The differences in cognitive styles of learning are so great among students who are relational dominant that these students are seldom able to demonstrate their native abilities and are therefore not rewarded socially as is the case with analytical learners. Relational students have fewer opportunities to exhibit their background of experience in the analytically oriented learning environment. Instead, relational learners are more often interpreted as being more disruptive in nature and less capable of performing well academically. Consequently, relational style learners tend to be the most creative and innovative in the arts due to innate learning style preference (see Table 3).

![Figure 2. Orientation to School Requirements by Skill-information Combinations](image)

<table>
<thead>
<tr>
<th>Skill-information Combinations</th>
<th>Orientation to School Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>High analytical skills, high motivation</td>
<td>High achievement, high I.Q.*, high success in school</td>
</tr>
<tr>
<td>High analytical skills, low information</td>
<td>High achievement, average I.Q.*, high anxiety (overachievers)</td>
</tr>
<tr>
<td>High relational skills, high information</td>
<td>Low achievement, high I.Q.*, behavior problems (underachievers)</td>
</tr>
<tr>
<td>High relational skills, low information</td>
<td>Low achievement, low I.Q.*, complete inability to relate to school, withdrawal and drop-out</td>
</tr>
</tbody>
</table>

Source: Cohen 1969, p. 837
<table>
<thead>
<tr>
<th>Analytical (As it is in general)</th>
<th>Relational (As it could be)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Rules</td>
<td>1. Freedom</td>
</tr>
<tr>
<td>2. Standardization</td>
<td>2. Variation</td>
</tr>
<tr>
<td>3. Conformity</td>
<td>3. Creativity</td>
</tr>
<tr>
<td>4. Memory for specific facts</td>
<td>4. Memory for essence</td>
</tr>
<tr>
<td>5. Rigid order</td>
<td>5. Flexibility</td>
</tr>
<tr>
<td>7. Precision</td>
<td>7. Approximate</td>
</tr>
<tr>
<td>8. Convergent</td>
<td>8. Divergent</td>
</tr>
<tr>
<td>10. Deductive</td>
<td>10. Inductive</td>
</tr>
<tr>
<td>11. Duty</td>
<td>11. Loyalty</td>
</tr>
<tr>
<td>12. Regularity</td>
<td>12. Novelty</td>
</tr>
<tr>
<td>13. Differences equal deficits</td>
<td>13. Sameness equals oppression</td>
</tr>
<tr>
<td>15. Direct</td>
<td>15. Indirect</td>
</tr>
<tr>
<td>16. Meanings are universal</td>
<td>16. Meanings are contextual</td>
</tr>
<tr>
<td>17. Constant</td>
<td>17. Evolving</td>
</tr>
<tr>
<td>19. Unison</td>
<td>19. Individual in group</td>
</tr>
</tbody>
</table>

Source: Hilliard, 1976, p. 9.41
Cross-Cultural Instruction

Piagetian theories provide useful frameworks to understand and apply empirical research findings to curriculum design. Piaget's work is applicable to all human societies. Differences in student performances may be more easily accounted for without placing inferiority or deficiency on students' cognitive abilities (as cited in Hale, 1982). Piaget (1966) identified four factors that influence the development of cognitive functions: (a) biological factors, which illustrate the constant sequence of stages; (b) equilibration factors, which occur by interacting with the environment and help verify the development of mental operations; (c) general socialization factors between individuals, which are identical in every society; and (d) social factors, which include educational and cultural factors (as cited in Hale, 1982).

Piaget referred to young learners as "scientists" in the sense that children explore the physical and social universe through independent experimentations. A set of "logical schemas" becomes the end product of learning, and schemas are applicable to any empirical material (Kozulin, 1999). Schemas are the sophisticated exploratory skills that infants develop while exploring the environment and gaining more knowledge about the world (Boeree, 2007).

Although Piaget (1966) began as a biologist, this theorist's work evolved into the nature of thought itself and above all, in the development of thinking or "genetic epistemology." Piaget refers to "assimilation" as the process a child takes in order to assimilate a new object into previously learned schema (Boeree, 2007). "Accommodation" is the process of a child accommodating a previous schema to an entirely new object.

"Assimilation" and "accommodation" are the two facets of learning or what
Piaget refers as “adaptation.” Piaget observed periods of time in which assimilation dominated in children and develop the stages of cognitive development from the observations.

**Figure 4. Piaget’s Stages of Development**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>The Sensorimotor Stage- (Birth to age two) The infant uses senses and motor abilities to understand the world through reflexes and a combination of sensorimotor skills.</td>
</tr>
<tr>
<td>Stage 2</td>
<td>Pre-Operational Stage- (Age two to seven) The child possesses mental representations of the world and manipulates mental images through the use of symbols in the form of drawings, written words, and spoken language. A clear knowledge of past and future is attained by working with symbols and thinking reflectively on objects, even when not present.</td>
</tr>
<tr>
<td>Stage 3</td>
<td>Concrete Operations Stage- (Age seven to eleven) The child is now able to solve problems through the use of logical operations or principles. The child incorporates symbols representationally and manipulates symbols logically within the context of concrete situations.</td>
</tr>
<tr>
<td>Stage 4</td>
<td>Formal Operations Stage- (From age twelve and on) The child’s thinking process now resembles an adult style of thinking or “hypothetical thinking.” The young adult may perform logical operations in the abstract form, rather than only in the concrete.</td>
</tr>
</tbody>
</table>

Source: Boeree (2007)

Educators began using the tools of anthropology in the 1970’s to better understand cross-cultural educational research. Cross-cultural instructional concerns place an anthropological perspective with the process for the adaptation of instructional materials to a different culture (Ward, 1973). Included in this theory are the following:
Figure 5. *Cross-Cultural Instructional Levels*

| First Level | Translation of school language to home; |
| Second Level | Adjusting the vocabulary to match reading level; |
| Third Level | Directing illustrations and examples to local experiences; |
| Fourth Level | Restructure instructional procedures to accommodate learner expectations; |
| Fifth Level | Connecting the content to local world-and-life views; and |
| Sixth Level | Accommodating the student learning styles. |

Source: Ward (1973)

Levels five and six become more complicated to address because of the limited understanding of: (a) the learner’s view of the world and life; (b) the concept of cognitive styles; and (c) the relationship between the two (Hale, 1982). Social classes and ethnicities are the two major ecological structures that produce diversity in human life style and development. Each ethnic group within a given socioeconomic level forms a subculture with its unique language, mannerisms, attitudes, and behaviors (Havighurst, 1976).

Chomsky (1957) is known as both the father of modern linguistics and the most influential practitioner in the linguistics field. The theory of language, known as “Chomsky Revolution,” has been equated with Darwin’s Theory of Evolution and Freud’s Theory of the Unconscious in regards to importance in the history of ideas. The Chomsky Revolution was the most rigorous approach ever developed in investigating the human mind through a systematic study of how people produce and understand language (Fox, 1998).
Chomsky’s fundamental mission was to construct symbolic representations from the “language faculty” or a human being’s inborn mental ability to acquire, apply, and understand language. “Universal Grammar” became Chomsky’s model that explained how all languages share common properties (Fox, 1998).

The unconscious level of linguistic knowledge (the deep structure) differs from the spoken form (the surface structure). Grammatical operations or “transformations” are used to create a variety of constructions discovered in actual speech. Universal Grammar requires satisfying two conditions by being: (a) detailed enough in nature to describe any possible construction in any language; and (b) simple enough to reflect the small set of innate principles allow people to acquire and use in language (Fox, 1998).

**The Decision-Making and Social Action Approach**

The Decision-Making and Social Action Approach is a critical pedagogy analysis that empowers students to systematically problem-solve inequities and injustices at school and in the community (Freire, 1970). Critical pedagogy is the concept that describes how students learn the basics of a skill while critically examining what they are learning at the same time (Freire, 1970).

School procedures and curriculum remain largely unchanged. Rather than open classroom doors to the world's violence to examine, interpret, and reduce, teachers shut out such learning opportunities, consciously or unconsciously. Unlocking the doors exposes both the teachers and students to emotionally, physically, and spiritually charged violence. "Knowledge emerges only through invention and re-invention," Freire writes, "through the restless, impatient, continuing, hopeful inquiry [that] human beings pursue in the world, with the world, and with each other" (Hale, p. 155). Furthermore, teachers
and students unite because the teacher takes a nonviolent stance of learning alongside, rather than teaching over students (Freire, 1970).

An investigative approach to subject matter fits Freire's description of a "problem-posing education" in which students study "generative themes" that shape their "epoch" (p. 80). Freire would call violence a "generative theme" of late 20th century America because of the significant effect on all people, whether the effect occurs consciously or unconsciously (Freire, 1970). Problem-posing education is based on creativity and fosters genuine reflection and action based on reality as learners engage themselves in inquiry and creative transformations. Students become more challenged and obligated to respond to that challenge when posed with problems that relate to their world. The role of teacher and student merges into a reciprocal one that allows teachers to be taught by engaging in the dialogue process with students. Education is the practice of freedom that requires authentic reflection concerning how people relate to their world (Freire, 1970).

The world does not exist as a reality apart from people with man playing the role of an abstract, isolated and independent human being (Freire, 1970). A form of education that places man as unattached to his world is one of domination and oppression. Thus, students and teachers become mutually accountable for the learning process as they educate each other (Freire, 1970). Language learning evolves from the learner concentrating on a triple process: (a) storage of past cues; (b) predictions of future ones; and (c) the association between the two (Yorio, 1971).

**Dialogical Teaching**

The epistemological relationship of dialogue presents itself as an essential component of the process of learning and knowing. Students must be able to transform
their life experiences into an acute awareness of the world as a way of facilitating the process of unveiling new knowledge or they will never be able to rigorously participate in a dialogue of discovering and discerning (Freire, 1970).

The process of attaining knowledge requires theorizing about the experiences shared in a dialogue process. “Dialogue is never an end in itself but a means to develop a better comprehension about the object of knowledge” (Freire/Macedo, 1970, p. 18). The arts facilitate critical thinking skills in the sense that the student becomes the creator who is responsible for making choices and effectively communicating validation (Freire, 1970).

Isaacs (1994), from the MIT Center for Organizational Learning, stated that dialogue provided a conceivably vital foundational process for generating new groundwork for learning within modern businesses. Isaacs suggested four promising themes for leaders to consider: (a) dialogue as a foundation for organizational learning; (b) dialogue as a prominent way of connecting the innate shared intelligence of groups to the expansion and extension of the collective inquiry process; (c) dialogue as an essential breakthrough in the way people preside over themselves; and (d) dialogue showing promise as an ground-breaking option to generating harmonized action among the group.

In every kind of information-based open-minded organization, new insights and guidelines are devised through dialogue. The dialogue in “Knowledge Age” organizations is not first and foremost adherent to (a) narrative; (b) exposition; (c) argument; or (d) persuasion, yet with resolving problems and creating new ideas (Bereiter and Scardamalia, 2005).
Abbey (2005) explored how structured dialogue can enhance the learning environment in schools and improve learning outcomes. Abbey argued that problem-solving dialogue was an influential tool in strategic change that could improve performance in every organization, while schools have not fully taken advantage of its power.

Dialogic literacy is the facility to engage effectively in conversation with the primary purpose of formulating new perceptions. Functional literacy, on the other hand, is the ability to apply conversational media to serve the purposes of daily life. Therefore, dialogic literacy is the underlying literacy for a knowledge society and dialogue should be shaped into educational policy so as to make it a primary objective (Bereiter and Scardamalia, 2005).

Dialogue, according to Abbey (2005), is more than exchanging thought and ideas in a discussion; it is a planned comprehensive process that leads to deeper knowledge and stronger practices. Conversational learning is a progression that includes building new meaning and altering the collective experiences into understanding through conversations (Baker, Jensen, and Kolb, 2005).

Alexander (2005) suggested that dialogic teaching was driven by profound knowledge, while methodically searching for reciprocity and expansion. Bruner’s concept of scaffolding in increasing classroom dialogue correlated with the Vygotskian belief (Alexander, 2005).

Nystrand (1999) conducted a study on whether or not dialogic teaching was taking place in schools, and discovered that dialogic discourse rarely occurred, constituting only 15% of instructional time in more than 100 middle and high schools.
The most disturbing finding in the study was determined with the lower track students, where there was little or no structured discussion at all.

Alexander (2005) suggested that schools adjust the ratio of written tasks to oral ones, accompanied by oral assessments. The interim findings of the pilot study from the two development projects in the United Kingdom by Alexander provided evidence of the following changes: (a) teachers had adjusted question styles from “what” and “who” to “why” and “how”; (b) students contributed more responses of expository, explanatory, justificatory or speculative nature; (c) students answered questions collaboratively with more confidence and at greater length; (d) lower performing students had alternative opportunities to show competence and progress; and (e) there was a substantial gap between teachers who were achieving significant changes and those whose practice had changed relatively little (Alexander, 2005).

The five dialectic components at the foundation of conversational learning are: (a) apprehension and comprehension; (b) reflection and action; (c) epistemological discourse and ontological recourse; (d) individuality and relationality; and (e) status and solidarity. While participating in conversation and embracing the differences across the dialectics, participants learn experientially both individually and organizationally (Baker, Jensen, and Kolb, 2005).

This proposed dialectical position on conversational learning states that conversation is a significance-making progression earned through the interchange of contradictions (Baker et al., 2005). Dialectics are a linguistic process that results in the generation of new thoughts and through one's consciousness between two or more
opposites. Mutual agreement is ultimately questioned when one’s point of view is stated and questioned from other perspectives (Baker et al., 2005).

Dialectical inquiry commences with (a) contradictions; or (b) opposing speeches. Learners increase the possibility of comprehending the whole situation by choosing the extreme opposite point of view. John van Maanen (1995) suggested a new mode of theorizing based on ongoing conversations that “plant, nurture, and cultivate”, rather than controversial and self-protective debates that led to division of different viewpoints (Baker et al., 2005).

The dialectic of uncertainty and perception is at the core of the dual-knowledge theory, and reality is seized by either (a) concrete knowing; or (b) abstract knowing (Kolb, 1984). Concrete knowing or apprehension begins with an instantaneous subjective feeling, which works as a structural and expressive gatekeeper that observes the emotional magnitude of understanding (Baker et al., 2005).

Abstract knowledge is comprised of a (a) linguistic; (b) conceptual; (c) interpretative process based in the left cerebral cortex (de Bono, 1969; Cazzaniga, 1985). Learning is founded on the multifaceted interrelationship of linguistic and conceptual cognitive processes. Incorporated learning happens through the simultaneous engagement of the two corresponding modes of knowing. James (1890) contributed the abstract underpinning of the dual knowledge theory in radical empiricism (Hickcox, 1990; James, 1890).

According to James, there were two co-equal and dialectically related ways of knowing the world through “knowledge of acquaintance”: (a) direct perception or apprehension; and (b) knowledge about mediating conception or comprehension.
“Through feelings we become acquainted with things, but only by our thoughts do we know about them. Feelings are the germ and starting points of cognition, thoughts the developed tree” (James, 1890, p. 222).

Freire (1992) described the exchange of dialectic reflection and action as from within two magnitudes: (a) reflection; and (b) action, with each suffering when there was an absence of one. Conversation is deep-seated in the dialectical interplay, whereas reflection is an indispensable element of making meaning that in turn guides and informs behavior into new concrete experiences for reflection. Dedicating time for group reflection is a way to open opportunities to review earlier comments that had not yet been explored, while expanding occasion for more attentive inquiries, which elicit individual and collective reflection.

“To exist, humanly, is to name the world, to change it. Once named, the world in its turn reappears to the namers as a problem and requires of them a new naming” (Freire 1992, p. 76). Divergent linear and cyclical processes extend conversational learning by eventually joining together as the fluctuation of spiral movements and as innovative ideas are advanced tangentially and questioned from various perspectives (Baker et al., 1997).

Freire (1992) cautioned that reflection without change turned into inactive dialogue, and activism on its own developed into action for action's sake. Extreme individualism might end in separation, while totalitarian authority silenced others’ right to be heard. Laissez-faire egalitarianism might produce pointless talk (Baker et al., 1997).

A self-monitoring practice in a conversation may be found in the development of norms. Conversations progress into a normative value core that (a) structures the
conversation; and (b) creates boundaries that define the space. The norms resolve (a) what may be said or not; (b) who may be heard or not; and (c) who has voice and who does not in the conversation. Consequently, the norms define boundaries that determine who is included or not in the conversation. To have influence in the conversation is notable from provoking reactions. The possibility of failure to construct new meaning occurs when the conversers who are unfamiliar with the norms are excluded and weaken the possibility on the construction of new connotations (Baker et al., 1997).

**Experiential Learning**

The Association for Experiential Education (2007) defines experiential education as a viewpoint and method in which educators decisively engage learners in experiences that require attentive reflection to (a) increase knowledge; (b) develop skills; and (c) clarify perceptions (see Figure 6).

The Experiential Learning Theory (ELT) emphasizes the central role experience plays in the learning process, 'the process whereby knowledge is created through the transformation of experience' (Kolb, 1984, p. 41). The fundamental idea of experiential learning theory (Kolb, 1984) is as follows: (a) straight-forward perceptions of experience alone are not sufficient for learning; (b) something must be done with the insight. “Transformation alone cannot represent learning, for there must be something to be transformed, some state or experience that is being acted upon” (Kolb, 1984, p. 42).
**Figure 6. The Principles of Experiential Education**

<table>
<thead>
<tr>
<th>The Principles of Experiential Education Practice:</th>
</tr>
</thead>
<tbody>
<tr>
<td>♦ Experiential learning occurs when carefully chosen experiences are supported by reflection, critical analysis and synthesis.</td>
</tr>
<tr>
<td>♦ Experiences are structured to require the learner to take initiative, make decisions and be accountable for results.</td>
</tr>
<tr>
<td>♦ Throughout the experiential learning process, the learner is actively engaged in posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative, and constructing meaning.</td>
</tr>
<tr>
<td>♦ Learners are engaged intellectually, emotionally, socially, soulfully and/or physically. This involvement produces a perception that the learning task is authentic.</td>
</tr>
<tr>
<td>♦ The results of the learning are personal and form the basis for future experience and learning.</td>
</tr>
<tr>
<td>♦ Relationships are developed and nurtured: learner to self, learner to others and learner to the world at large.</td>
</tr>
<tr>
<td>♦ The educator and learner may experience success, failure, adventure, risk-taking and uncertainty, because the outcomes of experience cannot totally be predicted.</td>
</tr>
<tr>
<td>♦ Opportunities are nurtured for learners and educators to explore and examine their own values.</td>
</tr>
<tr>
<td>♦ The educator's primary roles include setting suitable experiences, posing problems, setting boundaries, supporting learners, insuring physical and emotional safety, and facilitating the learning process.</td>
</tr>
<tr>
<td>♦ The educator recognizes and encourages spontaneous opportunities for learning.</td>
</tr>
<tr>
<td>♦ The design of the learning experience includes the possibility to learn from natural consequences, mistakes and successes.</td>
</tr>
</tbody>
</table>

Source: Association for Experiential Education (2007)

Two different types of knowledge in experiential learning are: (a) learning by oneself; and (b) experiential education. Experiential learning by oneself is also known as "nature's way of learning that occurs as a direct participation in the events of life" (Houle, 1980, p. 221). Experiential learning or "informal education" comes through the reflection on everyday experiences, with learning being organized by the learners themselves (Smith, 2003).

Experiential education programs, on the other hand, emphasize the nature of participants' subjective experiences. The experiential educator's role is to arrange and
facilitate direct experiences of a particular phenomenon under the assumption that the end result will be authentic, meaningful, and long-lasting learning (Smith, 2003). Further, experiential learning approaches deliberately attempt to construct conversational spaces for the praxis between reflection and achievement to be acknowledged and endlessly improved (Baker et al., 1997).

Programs that involve experiential education include work by Holmes (2000). Holmes sought to explore how teachers could use occasions or potential occasions of violence as opportunities for peacemaking. Holmes' work (2000) entailed an examination of how images of violence in popular culture can lead to a better understanding of violence by students and a lessening of aggressive behavior.

While acts of violence by and against teenagers blur the boundaries between the outside world and school, many educational leaders work diligently to reinforce the divisions. Administrators and politicians barricade schools from violence through fencing, gating, frisking, detecting, or otherwise blocking such intrusions. Schools ban potentially destructive sights and sounds of teenage life displayed on book bags, logos, music, caps, and other popular paraphernalia. Administrators appoint task forces to identify, study, and implement multiple ways to prevent "the real world" from destroying schools.

Holmes (2000) invited students and teacher to investigate other issues of particular consequence. Firstly, examining violence in films leads to insights about violence in male-female relationships, and violence in music opened up dialogue about interracial violence. Secondly, violence in popular culture represents a subject about which most students were most likely able to bring first-hand knowledge and experience
to the discussion. Such a discussion was meaningful to the students and provided an opportunity to express feelings, while demonstrating knowledge about the world outside of school.

The research on introducing violence as a topic of study in a student-centered approach demonstrates why teachers need to take students’ interests into account when choosing components of a curriculum (Holmes, 2000). Students’ lives literally guide lesson plans and violence in popular culture became a common practice in the middle and high school curricula.

The first phase of Holmes’ work involved mutual exploration proceeding from one class session to the next, while the instructor summarized student discoveries and demonstrated an interest in knowing what came next. Concrete comparisons took place, consequently, when students taught themselves a response to a particular question. The second phase, called investigation and interpretation, happened while on the search for focus. The goal is to guide students in identifying a text to conducting hands-on research, to inevitably interpreting findings. Students may enter the phase by either feeling: (a) drawn to a particular type of violence; (b) desire to prove a point; (c) ready to pose a research question; or (d) able to arrive at a thesis. Group activities of exploration and advance discovery follow afterwards.

Holmes’ findings provided evidence that students can learn ways to turn from violence toward peacemaking and to focus on critical inquiry in the classroom through the incorporation of the subject of violence in popular culture in the curriculum.
Learning Style Preferences

The ELT model illustrated two similar modes of interpreting experiences: (a) apprehension or a concrete experience; and (b) comprehension or abstract conceptualization. The ELT model also showed two dialectically related styles of transforming an experience: (a) intension or reflective observation; and (b) extension or active experimentation (Baker, Jensen, and Kolb, 2005). Kolb’s Experiential Learning Theory (ELT) “emphasizes the central role that experience plays in the learning process, the process whereby knowledge is created through the transformation of experience” (Kolb, 1984). The theory is called “experiential” because of the intellectual origins in the experiential works on learning and development of Dewey (1958); Freire (1970); James (1890); Lewin (1936); and Piaget (1966).

Kolb’s model (1984) of the learning process is constant with what is known about how people: (a) learn; (b) grow; and (c) develop. The ELT model illustrates two related modes of absorbing experiences: (a) apprehension or concrete experience; and (b) comprehension or abstract conceptualization. There are also two dialectically connected styles of transforming experience: (a) intension or reflective observation; and (b) extension or active experimentation.

“Learning requires individuals to resolve abilities that are polar opposites, and that the learner must continually choose which set of learning abilities he or she will use in specific learning situations” (Baker, Jensen, and Kolb, 2005). Some learners process and retain new information by experiencing the concrete or tangible qualities of the world, while depending on the senses and saturating themselves in a concrete reality. On the other hand, other learners who prefer not to rely on the senses, (a) perceive; (b) grasp; or (c) take
hold of new information through symbolic representation or abstract conceptualizations by analyzing or systematically planning (Baker et al, 2005).

Honey and Mumford (1982) identified four learning styles: (a) activists; (b) reflectors; (c) theorists; and (d) pragmatists. Since people differ in how they learn, it is critical for teachers to take the theorists’ approach into account while teaching (Atherton, 2005).

Activists have the tendency towards an open-minded approach to learning and involve themselves completely, without any bias, in new experiences. Reflectors stand back and observe experiences from different perspectives, such as collecting data. Theorists prefer analyzing, synthesizing, and extracting new information into a systematic and logical ‘theory’. Pragmatists are the experimenters who sample new ideas, theories, and techniques to determine how such ideas actually work in practice (Atherton, 2005).

Honey and Mumford (1982) designed the Experiential Learning Cycle to illustrate the four stages that follow each other: (a) concrete experience is experienced on a personal basis; (b) reflective observation on that particular experience follows next; (c) abstract conceptualization is the derivation of general rules describing the experience or the application of known theories to it; and (d) active experimentation is the stage where the learner constructs ways of modifying the experience. The stages may occur instantaneously or take up to months, depending on the topic (see Figure 7).
Kolb (1995) is known for his contribution to thinking around organizational behavior. Kolb's focus was on the nature of individuals and social change, experiential learning, career development and executive and professional education. The model of the experiential learning cycle was based on four elements: (a) concrete experience; (b) observation and reflection; (c) the formation of abstract concepts; and (d) testing in new situations (Smith, 2001).

Some learners retain new information through concrete experiences that rely on the senses and immersing oneself in a concrete reality. Other people learn through symbolic representations or abstract conceptualizations that require analyzing. Some learners observe others who are involved in the experience to reflect on the outcome in order to transform or process the overall experience. Other learners, on the other hand, prefer to immerse themselves and become actively involved (Baker, Jensen, and Kolb, 2005).
The Concrete Experience learner is self-directed and autonomous: (a) feeling or sensing to perceive information and make judgments in an experience; (b) recognizing theoretical approaches as unaccommodating; (b) treating each situation as an exclusive case; (c) referring to specific examples; and (d) relating to peers (Kolb, 1984).

The introverted Reflective Observation learner prefers: (a) performance to be calculated by exterior criteria; (b) a philosophical approach to learning; (c) depend greatly on cautious observation in making choices; (d) visual and auditory learning styles; and (e) the instructor to present an expert analysis approach.

The learner who favors the Abstract Generalization or Conceptualization learning style: (a) chooses an analytical and conceptual approach to learning that depends on logical and rational evaluations; (b) prefers symbols over people; and (c) learn best in authority-directed impersonal learning situations that emphasize theory and systematic analysis (Kolb, 1984).

Active Experimentation involves a "doing" approach to learning that: (a) relies profoundly on for experimentation; (b) engages the learner in projects or group discussions; (c) appeals more to extroverts; (d) favors kinesthetic or tactile (see Figure 8) (Kolb, 1984).
The learning cycle can begin at any one of the four points and should be approached as a continuous spiral. The learning process often begins with a person carrying out a particular action and then seeing the effect of the action in this situation (Smith, 2001).

As a result, Kolb (1976) developed a learning style inventory, which was designed to place learners on a line between concrete experience and abstract conceptualization; and active experimentation and reflective observation. Using this inventory, Kolb and Fry proceeded to identify four basic learning styles (Smith, 2001).
have recognized strengths and weaknesses associated with each style. However, the “locking into one style” can place a learner at a grave disadvantage (Smith, 2001).

The model provides an outstanding framework for planning teaching and learning and can be beneficially employed as a source for understanding (a) learning difficulties; (b) vocational counseling; and (c) academic advising (see Figure 9) (Smith, 2001).
**Figure 9. Learning Style Inventory**

<table>
<thead>
<tr>
<th>Learning style</th>
<th>Learning characteristic</th>
<th>Description</th>
</tr>
</thead>
</table>
| Converger      | Abstract conceptualization + active experimentation | - strong in practical application of ideas  
- can focus on hypothetico-deductive reasoning on specific problems  
- unemotional  
- has narrow interests |
| Diverger       | Concrete experience + reflective observation | - strong in imaginative ability  
- good at generating ideas and seeing things from different perspectives  
- interested in people  
- broad cultural interests |
| Assimilator    | Abstract conceptualization + reflective observation | - strong ability to create theoretical models  
- excels in inductive reasoning  
- concerned with abstract concepts rather than people |
| Accommodator   | Concrete experience + active experimentation | - greatest strength is doing things  
- more of a risk taker  
- performs well when required to react to immediate circumstances  
- solves problems intuitively |

Source: Kolb and Fry (1976)
Experiential learning provides students with the whole experience and challenges learners to discover elements of knowledge and the relationship toward one other (Williams, 2000). Writing is directly connected to living in reality, not in the abstract. Therefore, the teaching of writing should reflect life itself (Blitz and Hurlbert, 1998). When students' motivation for academic tasks is low, experimental learning stimulates original thinking and develops perceptual skills, while stimulating interest in the topic (Williams, 2000).

Teaching for Democracy and Social Justice

Teaching for democracy and social justice begins with teachers and students confronting inequalities in the classroom, school, and community. There are two approaches that interact in the process: (a) teaching for social justice; and (b) democratic classrooms (Gollnick, 2002).

Democratic classrooms engage teachers and students in understanding how to lead, as teachers, and follow, as learners, together. Students dramatize or reenact power struggles between students and teachers and become active participants in an environment being controlled by adults. Democratic classrooms help to overcome existing power inequities, as students become active participants in decisively probing how school and societal practices are interconnected to impartiality and social justice (Gollnick, 2002).

Shor (1996) defines critical thinking as “a holistic, historically situated, politically aware intervention in society to solve a felt need or problem, to get something done in a context or reflective action” (p.163). Students should be encouraged and supported in questioning the cogency of knowledge obtainable in textbooks. When teachers provide
the opportunity for students to explore other perspectives, students develop the critical thinking skills necessary to make sense of the events and conditions that affect people’s lives (Gollnick, 2002).

Students identified three factors in terms of exactly what plays a critical role in promoting solid relations between students and teachers: (a) the quality of teachers’ relationships with students; (b) the quality of education; and (c) the social skills that teachers convey to students (Metropolitan Life Insurance Company, 1996). The survey also noted that a majority of the students did not believe that teachers and other adults treated students of color and from low socioeconomic backgrounds equally (Gollnick, 2002).

Schools are comprised of both a formal and hidden curriculum, both having an enormous impact on both students and teachers. The hidden curriculum consists of: (a) unstated norms; (b) values; and (c) beliefs about the social relations of the school and classroom that are conveyed to students. The organizational structures of the school and the interactions between students and teachers constitute the hidden curriculum. Both curriculums together ought to incorporate the culture of both the students and community, while allowing students to evaluate the social and historical realities of one’s nation in a critical manner. Multicultural education begins with the culture of students and builds upon the history of a community by examining the causes of oppression and inequalities (Gollnick, 2002).

In order for classrooms to become models of democracy and equity, teachers must: (a) place the student at the center of the teaching and learning process; (b) promote human rights and respect for cultural differences; (c) believe that all students have the
capacity to learn; (d) acknowledge and build on the students’ life experiences; (e) critically analyze oppression and power relationships to better understand racism, sexism, classism, and discrimination; (f) critique one’s society with the idea of social justice and equality in mind; and (g) participate in a form of collective social action that ensures a democratic society (Gollnick, 2002).

A student-centered curriculum is one that places the student’s needs, background, knowledge and interests at the forefront in instructional delivery. This involves a democratically run classroom management system where students become active participants in governing the classroom and in critically analyzing school and societal practices related to equity and social justice (Gollnick, 2002).

It is essential that teachers consider students’ cultural backgrounds and heritage when setting the foundation for a multicultural approach to choosing learning resources. Teaching and interacting with culturally diverse learners requires an awareness of students’ cultural backgrounds and knowledge and the skills required to work in close interpersonal situations with students.

A Value Inquiry Mode- Moral Education

Banks (2003) designed a Value Inquiry Model that enabled students to identify value conflicts, examine principles reflectively, and defend moral choices. The model involved an observation-discrimination process that asked students to first recognize a value problem. Students described the value-relevant behavior and determined values that were exemplified by the behavior described. Students hypothesized about the sources of values analyzed and about the possible consequences of those values. Finally,
students declared their value preferences and verified the reasons for their choices (Banks, 2003).

**Figure 10. Value Inquiry Model**

1. Defining and recognizing value problems: observation-discrimination


3. Naming values exemplified by behavior described: identification-description, hypothesizing

4. Determining conflicting values in behavior described: identification-analysis

5. Hypothesizing about sources of values analyzed: hypothesizing (citing data to support hypothesis)

6. Naming alternative values to those exemplified by behavior observed: recalling

7. Hypothesizing about the possible consequences of the values analyzed: predicting, comparing, contrasting

8. Declaring value preference: choosing

9. Stating reasons, sources, and possible consequences of value choice: justifying hypothesizing, predicting

Source: Banks (2003)

The five key concepts of the multicultural curriculum were: (a) conflict; (b) cultural diversity; (c) values; (d) social protest; and (e) assimilation (Banks, 2003). The conflicts were encountered within different generations and subgroups within certain ethnic minority groups. Examples of where conflicts were as follows: (a) values; (b) goals; and (c) methods of protest.

Group identification among culturally diverse people of an ethnic group fluctuated substantially and was controlled by factors such as: (a) skin color; (b) social class; and (c) methods of protest. The values of the dark-skinned ethnic minority communities became more culturally incorporated, while the values were different from conventional Americans.

Movements or “social protest” from within ethnic minority groups have shown to: (a) increase more pride; (b) form new identities; (c) achieve more political power and
control over institutions; and (d) terminate stereotypes. Certain aspects of one’s cultural heritage were deserted when ethnic groups become assimilated and earned higher socioeconomic status. Assimilation took place in the third generation, and certain cultural aspects were recovered once stable in middle or upper class status (Banks, 2003).

Reflective decision-making concerning ethnic or racial problems depends on higher-level scientific knowledge. People identify, clarify and relate values through the "process of inquiry" (Banks, 2003, pg. 100). Many ethnic and racial problems from within our society are grounded in value conflicts. Hence, schools can serve to help students identify and clarify moral choices reflectively. Most importantly, students need assistance in understanding and predicting the possible consequences of an individual’s values.

Kohlberg (1975) “hypothesized that an individual’s ability to reason morally develops sequentially in a series of definite stages and that the stages are found in all nations and cultures” (Banks, 2003, p. 103). The three levels of moral development, defined by Kohlberg were: (a) the pre-conventional; (b) the conventional; and (c) the post-conventional. Each higher stage in the hierarchy was more advanced and rational, in terms of moral reasoning (Banks, 2003).
Kohlberg’s research revealed that when students were engaged in conversations about moral dilemmas, in which students were asked to reason at a stage above the present one, moral development and growth took place. Kohlberg’s theory of moral development was based on the individual proceeding through the stages sequentially and without skipping.

Kohlberg’s theory was based on the assumption that there was an indirect relationship between the chronological age of a person and the level of moral development. Kohlberg incorporated open-ended stories that presented moral dilemmas...
with follow-up discussions to encourage students to think at higher stages of moral development.

**Historical Developments in Arts Education**

Benjamin Franklin advocated the arts as early as 1770, while the formal introduction of art in America’s public schools began in the 19th century (Eisner and Ecker, 1966). The teaching of art in the early 19th century was up to those individual teachers who possessed the personal views and aspirations that promoted creativity and who felt compelled to do so. Hence, there were no state laws requiring teachers to advocate the arts (Eisner and Ecker, 1966).

In 1864, drawing became a required subject in the Boston Public Schools, resulting from the economic changes of the nation and the view that drawing was an essential vocational skill (Eisner and Ecker, 1966). The social and intellectual forces of the 1880’s, along with the Child Study Movement under the leadership of Hall and influences of Dewey and Freud, dramatically changed the state of art education in the United States (Eisner and Ecker, 1966). The developments of the Child Study Movement: (a) liberalized the art curriculum; (b) initiated an interest in the role of imagination; and (c) drew attention to the stages of development in visual expression (Eisner and Ecker, 1966).

Dewey, inspired by the work of Darwin and James, viewed man’s nature as being biological (Eisner and Ecker, 1966). Dewey perceived man as an organism that lived in and through an environment, which man needed to control in order to adjust (Eisner and Ecker, 1966). According to Dewey, man coped and grew in a problematic environment. Therefore, man needed to behave intelligently based on resolutions to past problems, thus
placing the role of experience in education as a crucial issue (Eisner and Ecker, 1966). Dewey’s work represented one of the most significant influences on art education in the 20th century because of the ideological leadership provided for the Progressive Education Association (Eisner and Ecker, 1966).

Art education, continuing well into the 20th century, was perceived as being solely the teaching of drawing (Eisner and Ecker, 1966). The teaching of drawing was identified as being useful to students of the late 19th century by: (a) basing art on geometric principles to meet the demands of an industrial society competing with European nations; (b) contributing to better writing habits through eye and hand coordination practice; (c) marking social refinement; and (d) achieving a cultural accomplishment that symbolized the finer aspects of life (Eisner and Ecker, 1966).

**Symbolic Transformation**

Langer (1942) delineated human behavior form as being unique from that of animals in the way that man possessed an austere outlook toward art. “Artists as a class are so ready to sacrifice wealth and comfort and even health to their trade, that a lean and hollow look has become an indispensable feature in the popular conception of genius.” (Langer, 1942, p.37)

The human brain is continuously carrying on a process of symbolic transformation of the experiential data that enters, enabling the brain to become a verified fountain of spontaneous ideas (Langer, 1942). The sheer expression of ideas becomes the accumulation of registered experiences. Symbolic transformation is a trait that distinguishes man from other animals and is demonstrated through various forms of (a)
art; (b) ritual; (c) laughter; (d) weeping; (e) speech; (f) superstition; and (g) scientific genius (Langer, 1942).

"An epistemological insight has uncovered a more potent, howbeit more difficult, factor in scientific procedure- the use of symbols to attain, as well as to organize, belief." (Langer, 1942, p. 26) According to Langer, "a changed approach to the theory of knowledge had a profound effect on psychology; the interest shifted from the acquisition of experience, the domain of sense, to the uses of sense-data, the realm of conception and expression." (Langer, 1942, p. 26)

The significance of "symbol-using" therefore became vital in the study of intelligence and learning, leaving a strong impact on genetic psychology, which studies the growth and development of the mind (Langer, 1942). The artist, like the scientist, discerns forms of facts and natural law in nature (Cassirer, 1944). Art, language and science appear as symbols, each containing forces that create and conceive its own world (Cassirer, 1946). Symbolic forms found in language and art reveal a certain way of seeing as they each carry a singular source of light (Cassirer, 1946).

The aesthetic experience is rich with infinite possibilities that linger vestigial in ordinary sensory experiences (Cassirer, 1944). Through the artist’s work, these possibilities become actualities are born and take on a definitive shape (Cassirer, 1944). The deepest allure of art is its inexhaustibility to crack open the infinite possibilities discovered in nature (Cassirer, 1944).

The philosophy of art reveals the similar conflict between two antagonistic tendencies that come across in the philosophy of language (Cassirer, 1944). The philosophy of arts and language derive from a comparable interpretation of reality.
Language and art vacillate back and forth between two opposite poles, the objective and subjective (Cassirer, 1944). Language first forms out of an imitation of sounds, whereas art originates from an imitation of externalities (Cassirer, 1944).

“It is characteristic of the nature of man that he is not limited to one specific and single approach to reality but can choose his point of view and so pass from one aspect of things to another” (Cassirer, 1944, p. 170). Language and science are the abstract essence of reality, while art stands as the intensification of reality as it continuously processes the concrete (Cassirer, 1944). “Once language, myth, art and science are recognized as such ideational forms, the basic philosophical question is no longer that of their relation to an absolute reality which forms, so to speak, their solid and substantial substratum; the central problem now is that of their mutual limitation and supplementation,” (Cassirer, 1946, p. 8).

Language reveals the world to man by disclosing the natural objects of humanity and makes man’s existence in a society feasible (Cassirer, 1946). Like language, art is restricted to myth, beginning as a concrete and evolving into a harmony of independent forms of spiritual creativity (Cassirer, 1946). Language and art become liberated from their ideal native stage of mythical thinking into a spiritual concord that is disclosed on a far higher level (Cassirer, 1946).

Art, like science, is a mental activity that brings the contents of the world into the dominion of impartially applicable cognition as it works to interpret the world’s emotional matter and validate consciousness (Langer, 1958). In contrast to Cassirer’s thinking, Langer (1958) saw the purpose of art, as it presents itself historically to human experiences, as absorbing the emotional content of the world. Artists allow art to seize
eternal life by: (a) maintaining it “universally communicable;” (b) objectifying content; (c) clarifying meaning; and (d) heightening its permanent realization (Langer, 1958).

Art, as in science, is emotive in character and seeks to be understood, regardless of whether or not the art transmits pleasure or extracts repugnance (Langer, 1958). Langer alludes that the role of art is to acquaint the percipient with something that has never been seen or heard before, not simply to provide pleasure to the observer (Langer, 1958). “All great art strives to give us revelations and demands from us our perception and recognition” (Langer, 1958, p. 36).

Freud (1960) analyzed the character of visual thinking in his studies of dreams and preconscious fantasies. Concrete subject matter, which characterizes thoughts, becomes a part of the human conscious (Freud, 1960). Thinking in pictures becomes a partial form of becoming conscious (Freud, 1960). Therefore, thinking in pictures remains closer to the unconscious processes than that of thinking in words (Freud, 1960).

Goodman’s aim (1968) was to explore systematically how the study of symbols and symbol systems function with each other in art and science, and how the relationship between the two affect man’s perceptions towards understanding the creation of his world. This theorist believed that emotions and sensations felt through art allow individuals to: (a) discriminate; (b) relate; and (c) grasp the work in order to integrate cognitively with the rest of their experiences and the world (Goodman, 1968).

Emotions work cognitively in combination with each other as an organism submits the mind and body while inventing and interpreting the symbols in art (Goodman, 1968). Expression in the arts demonstrates a variety of syntactic and semantic features that are also used in classifying metaphorical systems (Goodman,
The arts and sciences work together by using symbol systems that either agree, by enhancing one another, or differ by inhibiting each other (Goodman, 1968).

Symbols embody and function as a basis for language development (Goodman, 1968). Consequently, symbols are nonlinguistic systems that are developed before language acquisition occurs and remain in constant use (Goodman, 1968). Visual and non-visual objects and events may denote either visual or non-visual symbols; pictures work as representations within symbol systems far differently than they may be normally perceived (Goodman, 1968).

The Narrative Mode

"The medium of exchange in which education is conducted- language- can never be neutral, that it imposes a point of view not only about the world to which it refers but toward the use of mind in respect of this world" (Bruner, 1986, p. 121). Language is what establishes a viewpoint towards the vision of the world (Bruner, 1986).

Neurobiologists and physicists began working in the 1980's with the relationship between neural mechanisms in which images and symbols interrelate in the brain during the process of conscious cognition. Focused attention on the components of the visual image has a post-retinal visual effect on the neighboring cells. What the eye perceives in terms of color, form, and depth interacts in a continuous process with symbolic centers that work together with the visual projection centers of the brain. Visual perception is the result of the imagistic character of neural activity connecting with stored experiences that provide rationality to primary sensory images (Heath, 2000).

Art serves as a constant representation of the indispensable features of the external functions of the "visual brain" that bring meaning to perception and that are
interdependent with aesthetic sensibilities. Collaboration in art fosters the following areas of knowledge: (a) verbal explications and explanations concerning details in art; (b) abstractions that lead to theory building; and (c) procedural and dispositional knowledge (Heath, 2000).

The combination of verbal, visual, and gestural interactions that occur out of engaging acts with various modes of representation confirms the learner’s ability to (a) focus; (b) strategize; (c) discern components; and (d) integrate possibilities in the future. The visual arts demand the focus of attention to details of features, which in turn, trigger prior experiences and linguistic representations that are critical for academic achievement (see Figure 12) (Heath, 2000).

**Figure 12. Collaborative Theory Building**

<table>
<thead>
<tr>
<th>1. Specific strategies of problem development and solution allows for the reorganization of cognition for sustained learning.</th>
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<tr>
<td>2. Collaborative decision making enables a combination of mental and linguistic processes to engage in beliefs, experience, abstractions, argument that assist learners in developing theories about the world.</td>
</tr>
<tr>
<td>3. Metaphors are more easily interpreted as visual and verbal abilities reinforce one another through the assistance of sustained and adaptive learning in the visual images.</td>
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</tbody>
</table>

Source: Kress (1996)

The nature of language is “two faced” in the sense that it is both: (a) a mode of communication; and (b) a medium for representing the world in which it is communicating (Bruner, 1986). An individual is represented by how one speaks and what one talks about (Bruner, 1986). Interpreting the text follows the same pattern through the process of reading one another (Bruner, 1986).

Culture encompasses an unclear test that is relentlessly in need of interpretation by its participants. Thus, the role of language is to construct social reality (Bruner,
A culture is a medium for the negotiation and renegotiation that explains a set of rules (Bruner, 1986). Storytelling, theatre, and science are methods for increasing the capacity to investigate other worlds out of the context of the immediate one (Bruner, 1986). According to Bruner (1986), education cannot be the language of “fact and objectivity,” rather a request to reflect and build upon culture for metacognition to occur (Bruner, 1986). “Learning in most settings is a communal activity and a sharing of culture” (Bruner, 1986, p. 127).

Apprenticeship: The Traditional Route to Expertise

“Information-processing modelers of skills are demystifiers” (Gardner, 1997, p. 27). Gardner explains that no special skills, abilities or practices are necessary to become highly accomplished at something; one must simply endure adequate drill and practice with adequate feedback to become an expert in a particular area (Gardner, 1997).

According to Gardner (1997), some learners might attain skills more quickly than others because of their (a) intelligence; (b) motivation; or (c) quality of instructors. However, Gardner stressed that the Apprenticeship Model illustrated how any person who worked diligently enough for a sufficient amount of time should be able to become an expert in that area. Scientists working in the area of expertise have determined that ten years of purposeful practice are required to become an accomplished expert (Gardner, 1997). “Only practice separated the ordinary from the extraordinary, and anyone who applies him or herself for several years could attain such expertise” (Gardner, 1997, p. 28).

Other societies, influenced by Confucian ideas, such as China and Japan, view people’s accomplishments as being primarily: (a) a function of motivation; (b) a product
of how well people learn from mistakes; (c) a result of hard work; and (d) a matter of the teacher’s skill (Gardner, 1977). Asian societies place the arts as a priority for the first five years of life, training youngsters to eventually perform at a high level in: (a) an art form; (b) a music form; and (c) in athletic activities (Gardner, 1977). Western cultures, on the other hand, focus on scholastic mastery in the earlier years and involve the family in observing the child as part of the achievement process (Gardner, 1977).

Multiple Intelligences

“Any idea that ignores the necessary role of intelligence in production of works of art is based upon identification of thinking with use of one special kind of material, verbal signs, and words. Indeed, since words are easily manipulated in mechanical ways, the relinquish production of a work of genuine art probably demands more intelligence than does most of the so-called thinking that goes on among those who pride themselves as being intellectuals” (Dewey, 1958, p. 46).

Gardner searched for an alternative perspective on human intelligence and developed the theory of multiple intelligences in 1965. The theory was derived from a synthesis of: (a) information concerning human beings; (b) knowledge of the human brain; (c) findings from special populations of people form autistics to prodigies; and (d) the identification of capabilities that are valued in cultures completely unlike that of the United States (Gardner, 1977). Gardner proposed that human beings have evolved as a species into possessing eight diverse forms of intelligence: (a) linguistic and logical (deemed the most valuable on exams and in schools); (b) spatial; (c) musical; (d) bodily kinesthetic; (e) interpersonal; (f) intra-personal intelligences; and (g) the appreciation of the natural world (1977).
According to Gardner, the central core of the arts that made them fundamentally cognitive in nature was the representation of certain ways of knowing. The arts necessitated the use of specific kinds of symbols, which represented meaning and express feelings, in the forms of: (a) words; (b) pictures; (c) gestures; and (d) musical patterns (Gardner, 1989).

The primary pedagogical imperative of schools to this day has been the mastery of: (a) characters; (b) figures; (c) symbols; and (d) signs (Gardner, 1997). Students spend the majority of class time decoding symbols and notations that have been deliberatively de-contextualized in nature (Gardner, 1997).

Howard Gardner (1983) introduced the theory of multiple intelligences, which supported evidence of the human mind possessing seven distinct forms of intelligence. Gardner described his definition of intelligence as being the ability to either solve a particular problem or create a product that is valued culturally (Gardner, 1983).

In the mid-1980s Howard Gardner investigated why schools typically did not prepare students with a high quality education in the arts. Eventually Gardner (1983) was able to conclude that both divergent (thinking that moves away in diverging directions that involve a variety of ideas and solutions associated with creativity) and convergent (thinking that brings together information that is focused on solving a problem that has a single correct solution) thinking abilities could not be assessed by standardized tests.

Gardner began to examine schools' views on intelligence and how they tended to exclude creative and divergent thinking. The abilities most highly valued and maximized in schools were based on the verbal and logical-mathematical skills related to the IQ test. Gardner included evidence from an array of disciplines including: (a) cross-cultural; (b)
anthropological; (c) psychometrics; (d) neuroscience; (e) evolutionary; (f) cognitive science; and (g) developmental psychology (Gardner, 1983).

The result of Gardner’s analyses at Harvard’s Project Zero has attributed to identifying four forms of symbol use that are “symptomatic” of artistic symbolization: (a) conveying the mood found in expression; (b) attention to fine details or style; (c) arrangement of elements with their effects on each other and on the composition; and (d) communication of numerous meanings (Gardner, 1989). An artistic education offers students to become “symbolically literate” in the course of their artistic development, thus permitting art students the facility to read inventive representations found in compositions, while being able to write or produce creative icons in a variety of expressive ways (Gardner, 1989).

Gardner, along with his colleague Feldman from Tufts University, devised a new way of assessing competencies and identifying “profiles of intelligences” of preschool children with Project Spectrum in the 1980’s (Gardner, 1989). The Spectrum approach provides students with: (a) rich and inviting materials to stimulate a wide array of multiple intelligences; (b) colorful storyboards to elicit imaginative language; (c) board games to produce numerical understanding; and (d) a small replica of the class with miniature people to encourage students to interact with materials as a means of demonstrating progress in learning (Gardner, 1989).

First, Gardner described linguistic intelligence, located almost exclusively in the left hemisphere of the brain, as the ability to use words effectively. Linguistic learners had sophisticatedly developed auditory skills that resulted in these learners enjoying (a) reading; (b) playing word games; and (c) creating stories (Gardner, 1983).
The four aspects from the domain of Gardner’s definition of linguistic intelligence were: (a) the rhetorical aspect of language-the ability to use language as a means of convincing others; (b) mnemonic potential-the capacity of language as a tool for remembering information; (c) explanation-the use of language as a means of conveying meaning in learning; and (d) meta-linguistic analysis-the potential of language as a means of clarifying itself (Gardner, 1983, p. 78).

Next, Gardner (1983) defined musical intelligence, located in the right hemisphere of the brain, as a person’s aptitude for demonstrating sensitivity to rhythms and sounds (Gardner, 1983). The composer, as Gardner described, exhibited musical precocity, which involved the consequential process of a continuous musical impulse that the composer must crystallize for the music to take its own shape (Gardner, 1983).

Music was a separate intellectual competence that was not dependent on physical objects and may be elaborated to a considerable degree by exploring the oral-aural channel. The musician’s mind was primarily concerned with the mechanisms for tonal memory, while recording what was heard and submerging it into the unconscious and being subject to literal recall (Gardner, 1983).

Thirdly, logical-mathematical intelligence allowed learners to (a) reason; (b) calculate; (c) conceptualize; and (c) explore patterns and their relationships in an abstract fashion. Logical-mathematical intelligence required both sides of the brain: (a) the right side of the brain dealt with concepts; and (b) the left side of the brain remembered symbols (Gardner, 1983).

A person with logical-mathematical intelligence preferred dealing with abstractions and experimenting with forming concepts before elaborating on details in
carefully handled long chains of reasoning. This form of thought originated from a young child’s fundamental desire to (a) confront the objects of the world; (b) order and reorder them; and (c) assess the quantity of those objects. The section of the brain most crucial for processing visual-spatial intelligence was in the right hemisphere of the brain (Gardner, 1983).

As children developed an appreciation for the actual or potential actions performed on objects, they began to understand the relations obtained from the objects and formed them into propositions or statements. Eventually the children began to explore the relationship among the statements. Over the course of a child’s development the progression (a) moves from objects to statements; (b) from actions to the relations among actions; (c) from the sensory-motor to pure abstraction; and (c) towards pure logic and science (Gardner, 1983).

Visual-spatial intelligence derived from the need of the learner to form a relationship between the learner and the physical space in the environment. This form of intelligence allowed its learners a keen insight into drawing and being taught through (a) drawings; (b) verbal descriptions; and (c) physical imagery. However, visual and spatial abilities were not identical; one may possess visual perception without the capacity of transforming an absent world through drawing (Gardner, 1983).

The central aspects of visual-spatial intelligence emerged as a combination of abilities that included: (a) the capacities to perceive the visual world accurately; (b) the ability to perform transformations upon one’s initial perceptions; and (c) the finesse to re-create aspects of one’s visual experience, even in the absences of physical stimuli (Gardner, 1983).
The fifth form of intelligence, bodily-kinesthetic, permitted an individual to use the body effectively through (a) movements; (b) creating objects; and (c) touching. Bodily-kinesthetic learners communicated clearly through body language and benefited from learning with hands-on objects. This type of learner preferred (a) learning through physical activity; (b) acting out; and (c) role playing (Gardner, 1983).

Gardner (1983) described bodily-kinesthetic intelligence as comprised of two core capacities: (a) control of one’s bodily motions; and (b) the capacity to handle objects skillfully. Highly skilled performers have contributed greatly to the analyses of psychologists, who have described people with bodily-kinesthetic intelligence as translating intentions into actions. These learners held the knowledge of knowing which movement came next and could do so smoothly and with expertise. One’s kinesthetic sense appeared to monitor the process of executing motor actions through the central nervous system, while allowing an individual to judge the (a) timing; (b) force; and (c) extent of the movements in order to make immediate adjustments, based on spontaneous information (Gardner, 1983).

The physical operation of the bodily-kinesthetic systems, deriving from the right hemisphere of the brain, was extremely complex, involving the coordination of a variety of neural and muscular components in a highly integrated manner. Voluntary movements entailed the perpetual comparison of intended actions with the effects of the movements actually achieved. A continuous series of feedback signals between the motor and perceptual systems took place as the performance of movements was compared to the visual and linguistic image that was directing the activity (Gardner, 1983).
The nervous system was responsible for the (a) large portions of the cerebral cortex; (b) thalamus; (c) basal ganglia; (d) and (e) cerebellum feeding information to the spinal cord. Although the cerebellum contained abstract forms representing the movements to be executed, the motor cortex was actually more directly involved with the spinal cord and the execution of specific muscular movements (Gardner, 1983).

The sixth form of intelligence was interpersonal intelligence. These learners were able to reach a deeper level of understanding through profound empathy, while interacting with others through inward information-processing capacities controlled by the frontal lobes of the brain. This type of student benefited more from (a) group activities; (b) seminars; and (c) dialogues (Gardner, 1983).

Interpersonal intelligence, dependent on the interactions within any cultural setting, relied heavily upon the ability to (a) gather information from internal discriminations of what behaviors people might routinely make; and (b) apply the lessons learned through observations of others. This form of intelligence was an accumulation of both cultural and historical factors that regulated the more primary orders of intelligence. Interpersonal intelligence allowed the learner to reach a more profound understanding of others’ (a) feelings; (b) intuition; (c) interests; (d) goals; and (e) motivation (Gardner, 1983).

Finally, intra-personal intelligence involved a learner more timid in nature, one who tended to work independently and who could draw upon the internal discriminations routinely made by the individual. Individuals who possessed this form of intelligence demonstrated the following characteristics: (a) awareness of one’s own strengths and weaknesses; (b) motivation and determination; (c) strong sense of identity
and purpose; and (d) a goal setter. These learners tended to be both the most confident and independent of all the learning styles.

The core capacity of intra-personal intelligence was the ability to notice distinctions among other individuals in terms of (a) moods; (b) temperaments; (c) motivations; and (d) intentions. In application, the intra-personal intelligence allowed a person to interpret the intentions and desires of others for the purpose of having a certain type of influence on others (Gardner, 1983).

The result of Gardner's analyses at Harvard’s Project Zero attributed to identifying four forms of symbols used that were “symptomatic” of artistic symbolization: (a) conveyance of mood found in expression; (b) attention to fine details or style; (c) arrangement of elements with their effects on each other and on the composition; and (d) communication of numerous meanings (Gardner, 1989). An artistic education offered students the opportunity to become “symbolically literate” in the course of their artistic development. Thus, art students developed the facility to read inventive representations found in compositions, while being able to write or produce creative icons in a variety of expressive ways (Gardner, 1989).

Gardner, along with his colleague Feldman from Tufts University, devised a new way of assessing competencies and identifying “profiles of intelligences” of preschool children with Project Spectrum in the 1980’s (Gardner, 1989). The Spectrum approach provides students with: (a) rich and inviting materials to stimulate a wide array of multiple intelligences; (b) colorful storyboards to elicit imaginative language; (c) board games to produce numerical understanding; and (d) a small replica of the class with
miniature people to encourage students to interact with materials as a means of
demonstrating progress in learning (Gardner, 1989).

The purpose of spearheading the Spectrum Project was to: (a) build upon the
learning capacities and natural inclinations of young children; (b) capture the uniqueness
of each child; (c) identify the strengths and weaknesses of children in a multiple
intelligences learning setting; and (d) capitalize on the neurological research, which
supports a young child's exceptional capacity for learning (Gardner, 1989).

Spectrum teachers have detailed notes by the end of the school year concerning
the strengths and weaknesses of each student from observing and measuring the
children's "intelligences" in specific domains (Gardner, 1989). The intellectual profile of
preschool children was more easily distinguished than other age groups and the
assessment instruments implemented in the Spectrum Project were able to document
talents that were normally missed on standardized tests (Gardner, 1989).

The Key School in Indianapolis was built in the middle 1980's by a dedicated
group of elementary school teachers who wished to extend Gardner's theory of Multiple
Intelligences into practice (Gardner, 1989). The goal of the school was to expose
children from kindergarten through sixth grade to experiences that would stimulate and
educate the full scope of intelligences (Gardner, 1989).

The unique features of the Key School were its: (a) application of the Multiple
Intelligences theory in a school-wide setting; (b) educational experiments with
apprenticeships from special interest groups; (c) a "flow center" where children pursue
their own personal work and play preferences for the day; (d) school-wide themes created
to integrate the incongruent elements of the curriculum; and (e) video portfolios that includes descriptions, interpretations, and reflections of each child’s art (Gardner, 1989).

The various Rockefeller charities that supported a renewed interest in the arts throughout the 1970’s and 1980’s prompted the J. Paul Getty Trust to support a new approach in arts education called Disciplined Based Art Education (DBAE) (Gardner, 1989). The objective of DBAE was to: (a) place art education as part of the national curriculum movement; and (b) extend people’s concept of art as being simply a hands-on approach to that of fostering knowledge concerning art history, art criticism and aesthetics (Gardner, 1989).

The researchers at Harvard’s Project Zero, the Educational Testing Service, and the Pittsburgh public school system devised a new approach to arts education with ARTS PROPEL, which stands for Production, Perception, and Reflection, as a means of providing and alternative to the Getty ideas (Gardner, 1989). The aim of ARTS PROPEL was to produce more effective instruments for assessing artistic learning (Gardner, 1989).

ARTS PROPEL’S philosophy of arts education conceived artistic production across several art forms to be the central focus of the curriculum (Gardner, 1989). The educational outcome of students studying the arts in ARTS PROPEL was that students would be able to: (a) read and write the symbol features found in various art forms; (b) make fine discriminations in art; and (c) reflect upon artistic activities that contained historical or aesthetic components integrated into the activities (Gardner, 1989).

The curriculum and assessment approach in ARTS PROPEL reflected two approaches to teaching and testing: (a) a domain project, which was a set of exercises that
revealed an element central to the art form; and (b) an assessment, which required students to think and express in a particular artistic symbol system (Gardner, 1989).

Assessment in ARTS PROPEL tested students’ ability to: (a) compose an artistic variation; (b) revise the work; and (c) compare the performance to those of another artist or composer (Gardner, 1989). The ARTS PROPEL form of assessment was different from standardized tests since there was no need for students to demonstrate their proficiency in: (a) linguistic intelligence; or (b) logical-mathematical, such as in scientific problem solving (Gardner, 1989).

Intelligence has been defined operationally as one’s: (a) ability to answer items on tests of intelligence; (b) inborn attribute of faculty; and (c) underlying ability that remains unchanged with age, training, and experience (Gardner, 1993). According to Gardner’s (1993) definition, intelligence involved the ability to solve problems or create products that were results of a particular cultural setting or community (Gardner, 1993).

The problem-solving skill was applied to a situation in which a goal must be obtained, along with the appropriate choices that led to that goal (Gardner, 1993). The skill of creating a cultural product required that the creator: (a) captured knowledge; (b) transmitted understanding; and (c) expressed one’s viewpoints and feelings (Gardner, 1993). “Intelligence must be susceptible to encoding in a symbol system- a culturally contrived system of meaning, which captures and conveys important forms of information” (Gardner, 1993, p. 16).

In traditional societies, intelligence entailed the competence of maintaining the social ties in one’s community (Gardner, 1993). Individuals in traditional cultures
depended more on the cooperation of others to meet their basic needs. Therefore, the
ability to network was deemed as a valuable form of intelligence (Gardner, 1993).

The notion of measuring one’s intelligence was conceived in the early 20th
century with Binet’s work (1905) in Paris and the formation of the debatable “IQ” test
(Gardner, 1993). By the middle of the 20th century, a stellar psychologist named Guilford
called attention to a scientific inquiry into creativity (Gardner, 1993). The purpose of
Guilford’s search was not to determine whether or not creativity was equivalent to
intelligence, rather to devise a variety of measures concerning how to ascertain which
individuals had the potential to be creative (Gardner, 1993). Standard measurement up to
this point in time had identified intelligence as being comparable to divergent thinking
(Gardner, 1993).

Twentieth century psychologists reached three conclusions following Guilford’s
challenge of measuring creativity: (a) creativity and intelligence were correlated, yet not
analogous; (b) creativity tests were reliable in the sense that similar scores were achieved
after taking the test repeatedly; and (c) creativity tests had not been demonstrated as
being valid, meaning that high scores on the creativity tests did not guarantee creativity in
one’s vocation (Gardner, 1993).

The theory of multiple intelligences implied that people were more inclined to
learn when involved in an activity for which they have talent (Gardner, 1999). Pursuing
activities for which students had a talent allowed the learners to make progress and avoid
unnecessary frustrations (Gardner, 1999). A multiple intelligences perspective enhanced
understanding in three ways by: (a) providing powerful points of entry (the attention

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grabber); (b) offering analogies (models); and (c) providing multiple representations of the central idea of the topic (core ideas illustrated in different situations) (Gardner, 1999).

**Modes of Treatment**

The type of experiences a person had depends on the kinds of sensory systems that picked those experiences up and the meaning the individual interpreted (Eisner, 1982). "The conceptualization of forms of representations as vehicles through which conceptions are externalized does not, by itself, describe the particular ways in which such forms can be treated so that form of equivalent to a referent is created" (Eisner, 1982, p. 56). The term "modes of treatment" (Eisner) referred to how any form of representation might be analyzed. The three modes of treating forms of representation were: (a) mimetic; (b) expressive; and (c) conventional (1982).

First, the mimetic mode of treatment replicated the surface features of some aspect of the qualitative world through imitation. There have been examples of the mimetic mode of treatment throughout history, such as in how hieroglyphics illustrated man’s ability to combine the visual spatial experience with his temporal experience by sequencing visual images paralleled (Eisner, 1982).

Next, the expressive mode of treatment was the product of a deeper analysis of surface features that revealed a form’s expressive character that shone light into the emotionality behind art (Eisner, 1982). Finally, the conventional mode of treatment helped to explain the conventions that stood in the place of something else, such as in words or colors (Eisner, 1982).

The subject areas that cultivated and refined the sensibilities the best were the fine arts, such as visual arts, music, dance, and drama (Eisner, 1982). The arts were created
out of the human need to receive and convey information in forms that capitalized on the use of different sensory systems (Eisner, 1982). Human beings became bored, saturated, and withdraw psychologically if the ability to alter one’s state of mind was unavailable (Eisner, 1982). When school programs provided only a limited range of educational conditions for students to demonstrate their various aptitudes, conditions for optimizing learning were diminished (Eisner, 1982).

Transfer of Learning through the Arts

Scholars from both cognitive and developmental psychology, linguistics, anthropology, sociology, economics and neuroscience became particularly interested in the benefits attained from learning through visual and performing arts when the “Mozart Effect” was broadcasted worldwide in 1996 (Catterall, 2005). The two main points of Catterall’s central theory on the “silent” transfer of learning were: (a) participating and learning in the arts reorganized the way the brain functions to allow for a deeper understanding; and (b) the development of brain function due from learning in the arts impacted how well the brain processes other tasks (Catterall, 2005).

Catterall identified two significant ways, called conversation and silence, in which children processed information and thus learned through the arts. First, the inner “conversation” of artistic creation was a meta-cognitive activity that allowed the artist to step back in order to consider thoughts and assist the thinking processes (Bruner, 1960). There was also the conversation of interest related to the social exchanges and verbalized reflections surrounding art as well as the inner conversation derived from the artist that took place as the artistic creation was formed.
Learning was fundamentally social in nature (Vygotsky, 1978). The inner conversation involved reached an understanding through the reflection process of one’s own thinking or meta-cognition (Bruner, 1960; 1966). The “silence” referred to the subconscious brain function and cognitive re-structuring of the brain that connected learning in the arts with non-arts related skills and was strengthened through inference skills.

“Silence” was the subconscious transfer that Catterall referred to as a neuro-dynamic learning process that occurred without the learner’s awareness. Learning through the arts altered the neural pathways and neuronal firing patterns in the brain and resulted in the transfer of skills. The conversation, whether silent or verbal, which a viewer perceived from art, or which the artist engaged in while producing art, allowed for an alternative exploration of ideas and emotions, which in turn presented an authentic learning experience for both (Catterall, 2005).

The Drama in Education Model

The Drama in Education model (1984) placed the learner as both the participant and observer as the learner played an improvisational role while interacting with others simultaneously. The theatre in education movement (TIE) was conceived in the United Kingdom (Catterall, Chapleau, and Iwanga, 1999). The classroom teacher facilitated the drama by building on the actions and reactions of students. Teachers modified and reframed the imagined context in order to create an episodic sequence of dramatic actions. The emphasis was on process over product with learning emerging from choices and decisions made during the development or improvisation.
Heathcote’s teaching praxis was a concept adopted from Freire’s *Cultural Action for Freedom* (1972). Drama also had positive effects on lower performing students by (a) encouraging oral communication; (b) increasing motivation; (c) raising students’ capacity for empathy; and (d) lowering students’ sensitivity to rejection (Stern, 1983).

Heathcote’s Drama in Education model was an academic strategy for learning that incorporated the use of drama techniques and improvisational roles within an imagined context to support learning in the classroom. Drama in Education differed from conventional theater in the way traditional theater was performed with a scripted dialogue on a set in front of an audience (Heathcote and Bolton, 1995). Readers relied upon that knowledge of the world to make sense of a linguistic text. Efficient reading required getting to the meaning, as demonstrated through the arts (Goodman, 1996).

Improvisational drama in the classroom involved the expressive interpretations of the written text. Students created a living moving picture of life with the primary aim of igniting discovery for the participants with no audience involved. Students (a) identified a problem from a given theme; (b) clearly defined the conflict; and (c) became actively involved in the process of problem-solving (Heathcote, 2000).

In dramatic activities, students used and examined their present knowledge in order to induce new knowledge, which helped students reframe their knowledge into new perspectives. Dramatic activity was a way of exploring subject matter and its relationships to self and society (Heathcote, 2000).

Freire believed in the dialectical movement of action and reflection; action causes reflection and reflection causes new action. Ideas were shaped in action by the sender.
(the teacher) and modified in practice by the signals of the receiver (the child) (Heathcote, 2000).

Theatre has had an especially strong impact on diverse learners and students who tended to be behavior problems in the class. Teachers have traditionally incorporated more visual arts in the classroom, rather than performing, because of the convenience. Educational drama involved students in active role-taking situations in which attitudes, discovered in the moment, were the chief concern (Heathcote, 2000).

**A Link between Drama and Verbal Skills**

Podilozny (2000) selected 80 studies from 200 studies performed on drama and language development since 1950. The criteria for the studies were as follows: (a) possessing at least one measure of verbal achievement; (b) being an experimental design; (c) having enough information for an effect size to be calculated.

The review of instructional practices was placed in three elements of drama: (a) enactment; (b) plot; and (c) the leader’s level of involvement. Podilozny (2000) determined seven set verbal outcomes to be observed in the central categories: (a) oral measurement of understanding of stories; (b) written measurement of comprehension of stories; (c) reading achievement; (d) reading readiness; (e) oral language development; (f) vocabulary; and (g) writing.

Podilozny (2000) coded all the studies and a solution for the five percent rate of disagreement in the coding was found by re-examining the texts. The average effect sizes were then calculated across the groupings. Finally, the nine hypotheses were tested concerning the presence of specific factors associated with the hypotheses, which are as follows: (a) substantive variables pertaining to the sort of treatment or kind of participant;
(b) method variables associated with research method; and (c) extrinsic variables that related to either the publication date or status.

The first meta-analysis of the 17 studies (a) orally assessed the effect of drama on the comprehension of stories; and (b) contained effect sizes ranging from $r = 0.00$ to $r = 0.66$. The necessary condition for determining statistical confidence was not found in the confidence interval range of $r = 0.00$ to $r = 0.66$, which helped support a connection between drama and the oral understanding of stories. The significant diverse findings in the effect sizes encouraged more testing of other possible relationships with an assortment of other variables.

The second meta-analysis supported a relationship between drama and understanding in the form of written measures. The effect size range was $r = 0.00$ to $r = 0.96$ and the confidence interval ranged from $r = 0.37$ to $r = 0.73$. Additional analysis of the variables stimulated the mixed nature of the effect sizes for this particular group concluded that drama instruction could be even more effective for low remedial readers. The previous meta-analyses conducted had discovered that only average populations had benefited from drama.

The third meta-analysis evaluated reading achievement and measured its progress through the form of standardized tests. The effect size range was $r = 0.15$ to $r = 0.56$ and the confidence interval ranged from $r = 0.11$ to $r = 0.29$. The results supported a relationship between drama instruction and reading achievement.

The fourth meta-analysis examined reading readiness and comprised of a range of effect sizes of $r = 0.03$ to $r = 0.66$. The measured confidence interval of $r = 0.15$ to $r = 0.36$
reinforced the conclusion that there was a correlation between instruction in drama and reading readiness.

The text in the report of the fifth meta-analysis on oral language development concludes that the range of effect sizes was between $r = -.04$ to $r = .73$. The calculated confidence interval ranged from $r = .20$ to $r = .41$, which resulted in a relationship between drama instruction and oral language development.

The sixth meta-analysis resulted in no relationship with the effect sizes, which ranged from $r = -.20$ to $r = .37$ and a confidence interval of $r = -.07$ to $r = .19$. Therefore, there was no resolute connection between instruction in drama and vocabulary development.

The eight studies of writing achievement in the seventh meta-analysis revealed the confidence interval on the effect sizes as ranging from $r = .09$ to $r = .52$ and helped maintain the conclusion that there was a link between drama instruction and writing achievement.

The meta-analysis procedure was suitably based on grouping comparable studies and distinguishing specific outcome results. The weaknesses in the research base included the following: (a) a deficiency in conversation among researchers; (b) the uncommon replication of studies; (c) insufficient consistence of measures; and (d) a shortage of set operational definitions.

The results of the extensive meta-analyses study confirmed positive correlations that reinforce the notion that drama may indeed assist students in developing stronger verbal skills. Positive effects were discovered in six areas concerning language development: (a) oral and written measures of recalling stories; (b) achievement in
reading; (c) reading readiness; (d) development of oral language; and (e) writing (Podilozny, 2000).

From a methodological approach, the effect size calculations and the further analysis of other variables, when the sizes became too diverse, added to the credibility of the report. Most importantly, educators have confirmation that the results signify how a transfer of skills from one domain to the other must be explicitly taught. The result that performing a story allows for an entirely new and different story to become more graspable reinforces the idea that drama develops text comprehension skills that consecutively transfer to new material (Podilozny, 2000). A remarkable eight of the nine hypotheses were sustained, all except for the connection between drama and achievement in vocabulary development.

Recommendations for future research were as follows: (a) explore more territory within drama and education to include older students in the upper grades; (b) examine probable outcomes beyond reading and language development; (c) observe learning that takes place from interpersonal and intra-personal modes of intelligence while interacting and performing various roles; (d) expand on characters with worldviews and beliefs that increase students' empathy for others; and (e) discover the impact that live student performances have on both performers and audiences.

The Arts Education Partnership-Reading Skills and Dramatic Play

The Arts Education Partnership conducted research that examined the relationship between: (a) reading skills; (b) drawing inferences from written materials; and (c) translating narrative and sequence texts with the dramatic format. The study found that through play the children demonstrated an understanding of the important facets of their
literacy. The areas of literacy were: (a) students' ability to read texts and materials related to play; (b) the use of written artifacts within play; and (c) the amount of efforts displayed while composing scenes and plays.

Within the “risk-free” atmosphere of dramatic play, children were also able to expand their use of literacy skills. The results showed a positive relationship between creating stories and translating stories into play texts. The study also supported the use of dramatic play in the child-centered classroom in that the students' social status within the classroom elevated literacy skills (Deasy, 2002).

Two urban schools elected students in another study conducted by the Arts Education Partnership. There were 21 students in the experimental group and 14 in the control group. Thirty-five learning disabled students from diverse ethnic and cultural backgrounds, ranging from the ages of 5 to 11, participated in the study. The main design was a pre- and post-test model with two groups.

The treatment group participated in 12 weekly 40-minute creative drama activities, and separate drama programs with common goals were provided for the students with learning disabilities who received primary and intermediate level instruction. The comparison-group children received their normal routine of weekly language therapy.

Student language skills were assessed before and after the intervention using the Test of Language Development (TOLD). The Walker-McConnell Scale of Social Competence was used to gauge social skills, along with the Test of Specific Oral and Language and School Adjustment Skills (SLS). Post-test measures were taken in the two weeks following the program and eight weeks later to test for sustained effects. The
researchers used analyses of variance for testing group differences on various post-test measures and pre- to post-test gains.

The children who participated in the creative drama program increased their social skills in all four clusters of social behaviors more than students in the control group. They also significantly improved in the area of oral expressive language skills when compared to the control group. The follow-up test was the most critical element of the research design. The study tested for sustained effects two months later, and all post-measures of language and social skills for the drama group held up over time (Deasy, 2002).

**Causal Links between the Arts and Academic Achievement**

Winner and Cooper (2000) carried out an inclusive literature search of studies exploring the relationship between the arts and academic achievement. The selection criteria decreased the number of studies yielded to a total of 31, which were then categorized into correlational and experimental groups. In order for the studies to be chosen, the studies had to meet each of the following four standards: (a) regarded the arts in general, rather than specific arts disciplines; (b) incorporated comparison and control groups; (c) resulted in an outcome based on student achievement; and (d) contained enough data to calculate an effect size.

There were a total of three meta-analyses performed on the correlational group. The first meta-analysis chose five studies that had the academic outcomes presented as composite or the total of the math and verbal scores. The second meta-analysis examined the relationship between the arts and verbal skills. Finally, the third meta-analysis explored the connection between the arts and mathematics. The two meta-analyses that
investigated outcomes in math were performed on the experimental group, and the other meta-analyses searched for verbal outcomes (Winner and Cooper (2000)).

The results of the three correlational meta-analyses, that Winner and Cooper (2000) performed, determined noteworthy links between arts study and academic outcomes. The effect sizes in the composite academic meta-analysis for verbal and math skills ranged from $r = .04$ to $r = .08$, with a mean of $r = .05$. The Stouffer’s $Z$ and a $t$-test of the mean $Zr$ were both considerable ($Z = 50.89, p < .001$ and $t = 5.97, p = .004$).

The arts and verbal meta-analysis found effect sizes ranging from $r = .14$ to $.25$, with a mean of $r = .19$ (Stouffer’s $Z = 333.43, p < .001$ and $t$-test of the mean $Zr = 16.52, p = .0001$). The arts and mathematics analysis included studies with effect sizes ranging from $r = .00$ to $r = .17$, with a mean effect size of $r = .10$ (weighted $r = .01$). The following effects were also discovered as being significant ($Z = 189.73, p < .0001$ and $t = 6.936, p < .0001$).

The experimental studies for the meta-analysis of the effect of the arts on verbal performance yielded 24 effect sizes. The effect sizes ranged from $r = -.25$ to $r = .66$. The mean un-weighted effect size was $r = .07$ (weighted $r = .01$). Even though the Stouffer’s $Z$ test was substantial ($Z = 3.82, p < .0001$). The $t$ test of the mean $Zr$ was not ($t = 1.66, p = .11$). The arts and math meta-analyses revealed similar results. The effect sizes ranged from $r = .14$ to $r = .34$ (mean $r = .06$, weighted mean $r = .02$). The Stouffer’s $Z$ test was significant ($Z = 3.10, p = .001$), however the $t$-test of the mean $Zr$ was not ($t = 1.63, p = .13$) (Winner and Cooper (2000)).

Winner and Cooper (2000) applied a meta-analytical approach to experimental and correlational studies that explored the connection between learning through the arts.
and academic achievement. Although the results validated a relationship between the arts and student achievement, the findings did not reveal a causal correlation from the arts to academics. However, substantial correlations between experiences in multi-arts and a fused set of outcome measures were uncovered. The varied results from the statistically significant tests in the meta-analysis of experimental studies did not yield enough evidence to maintain that the arts have a causal relationship on academic achievement, even though the mean effect sizes resulted in being positive.

Winner and Cooper (2000) recommended that more research be conducted regarding the most appropriate approach to (a) evaluating the literature; and (b) reflecting on the weaknesses and strengths of the approach taken in this study. Due to the inconclusive findings in the causal analysis, the need for stronger measures in suitable outcomes is recommended in future research. Although transfer outcomes tend to be more complex to measure, focusing on test scores as primary sources of outcomes is too narrow of an approach.

The meta-analysis will require controlling for extraneous variables, while at the same time, implementing a variety of experimental studies that quantify the transfer process questioned in arts integrated activities in regards to the transfer of: (a) treatment; (b) process; and (c) outcomes. It is recommended that researchers attempt to fathom the magnitude of the artistic experience and its valuable outcomes in measure beyond experimental approaches, instead with a multiplicity of approaches.
Arts and Academic Achievement

The purpose of the research conducted by Winner (2000) on REAP was to ascertain which instrumental claims for arts education could be made. Arts educators have worked diligently to strengthen the role of arts in America’s schools by arguing that the arts could reinforce “the three R’s” through helping children learn to read, write, calculate, and understand scientific concepts. The approach of including the arts to strengthen other academic areas became an approach and a favored strategy in the United States to maintain the arts in public schools.

Winner (2000), whose work focused on the developmental psychology of the arts, was the principal investigator of the REAP research team and the senior research associate at Project Zero, located at Harvard Graduate School of Education. Winner remains dubious of instrumental claims in favor of the arts that state the arts are as effective at teaching an academic subject as a direct teaching approach of that subject would be (Winner and Hetland, 2000).

If the arts are given a role in our schools because people believe the arts cause academic improvement, then the arts will quickly lose their position if academic improvement does not result or if the arts are shown to be less effective than the 3 R’s in promoting literacy and numeracy. However, when the arts are given a serious role in the curriculum, academic achievement improves (Winner, 2000, p.2).

REAP conducted a comprehensive search for all studies 1950-1999 that had tested the claim that studying the arts led to increased student achievement. More than eleven thousand articles, books, theses, conference presentations, technical reports and unpublished data turned up from the search. One hundred eighty-eight reports, with 275-
effect size $r$'s investigating the relationship of the arts to academics, were retained and calculated. A set of 10 meta-analyses were conducted that combined and compared the effect sizes across group studies with similar research questions. Statistical analyses were then used to determine whether the effect size, ranging from small to large, could be generalized to new studies on the same research question.

Three areas were found in which a substantial number of studies have demonstrated a strong causal link between education in the arts and academic achievement. However, no causal link was found in the other seven areas. The lack of findings in those seven areas may be attributed to: (a) the fact that there was no causal link; (b) the causal link was not strong enough to be applied to other studies; or (c) there were not enough studies carried out a particular research question (Winner and Hetland, 2000).

The three areas where reliable causal links were found were: (a) listening to music and spatial-temporal reasoning; (b) learning to play music and spatial reasoning; and (c) classroom drama and verbal skills.

Based on the 26 reports, with 36 effect sizes, Winner (2000) found a medium-sized causal relationship between listening to music and temporary improvement in spatial-temporal reasoning. However, there was a wide variation in the studies with some showing a clear effect and many not showing any effect at all. The existing research does not reveal conclusively why listening to music affects spatial-temporal thinking. The finding was of interest scientifically because it suggested that music and spatial reasoning were related psychologically and neurologically.
There was a large causal relationship found between learning to make music and spatial-temporal reasoning based on the 19 reports with 29 effect sizes. The effect was more significant when standard music notation was learned. Even without notation, the effect was still large. The value of improved spatial skills for success in school, however, has not been determined and depends on too many variables such as how subjects are taught (Winner and Hetland, 2000).

From the 80 reports with 107 effect sizes, a causal link was discovered between classroom drama (enacting texts) and a variety of verbal areas. Most of the effects were of medium size in: (a) oral understanding; (b) ability to recall stories; (c) reading readiness; (d) raising achievement; (e) oral language; and (f) writing. The large effect was on: (a) written understanding and (b) the ability to recall details in stories. In all cases, students who enacted texts were compared to students who read the texts but did not re-enact them. The results showed how drama helps build verbal skills, highly valued in many aspects of education (Winner and Hetland, 2000).

The seven areas where no reliable causal links were found were in: (a) arts-rich education and verbal and mathematical scores; (b) arts-rich education and creative thinking; (c) learning to play music and mathematics; (d) learning to play music and reading; (e) visual arts and reading; (f) dance and reading; and (g) dance and nonverbal reasoning.

Winner (2000) found a small to medium correlation was found between studying the arts and academic achievement based on 31 reports with 66 effect sizes. No evidence was discovered that caused academic achievement to improve. The correlational findings
might be explained by non-causal mechanisms, such as high achieving students could be
guided to study the arts.

No relationship between studying arts and verbal creativity test measures was
found based on four reports with six effect sizes. Although a small to medium-sized
relationship was detected between studying arts and figural creativity tests, the
relationship could not be generalized to new studies.

A small causal relationship was found, based on six reports with six effect sizes,
between music training and math. Although three of the studies produced medium
effects, three produced either very small ones or none at all. Therefore, more studies are
needed before any firm conclusion could be drawn.

The five reports, with seven effect sizes, in which visual arts was taught
separately from reading showed a very small relationship between visual arts and
reading. Based on the four reports with four effect sizes where visual arts was integrated
in reading instruction, a medium-sized relationship was ascertained between integrated
arts and reading instruction. However, the results could not be generalized to new studies
(Winner and Hetland, 2000).

In terms of dance, a small relationship was found in the four reports with four
effect sizes between dance and reading. A small to medium-sized causal relationship was
found between dance and improved visual-spatial skills in three reports with four effect
sizes. However, none of the studies in dance could be generalized to new studies since
the value of the effect was unclear with so few reports.

Further research is recommended to understand the mechanism by which: (a) an
arts-rich education impacts verbal and mathematical scores; (b) an arts-rich education
ignites creative thinking and develops problem-solving skills; (c) learning to play music increases scores in mathematics; (d) learning to play music increases reading achievement; (e) visual arts improves reading ability; (f) dance advances reading; and (g) dance encourages nonverbal reasoning.

Winner (2000) also recommended that more research be conducted concerning how the arts foster a transfer of learning to non-arts areas. In particular, two kinds of studies requiring rigorous methods should be conducted to advance researchers' understanding of the relationship between the arts and non-arts outcomes: (a) theory-building studies and (b) theory-driven experiments.

A theory-building study could help determine what happens in schools when the arts are given a prominent role. Researchers could carry out ethnographic studies of exemplary schools that place the arts in a serious role regarding the curriculum.

How the arts motivate non-academic students could be revealed in a theory-driven experiment. The possibility of a certain type of student could benefit more from the arts than others. There have been no experimental studies that have tested the hypothesis that increased motivation from the arts results in higher student achievement.

**SPECTRA+ Program- Evidence of the Arts Contributing to Academic Success**

SPECTRA+ was a four-year model arts initiative that was implemented in January of 1992 in each of the elementary schools located in Hamilton and Fairfield, Ohio. The integrated arts program is based on the Burgard Associates A+ program. However, the Hamilton Fairfield Arts Association (HFFAA) customized the program. The schools located in mid-sized communities of Ohio viewed art as essential as any other subject area. The HFAA served as (a) the program coordinator; (b) arts resource;
(c) financial manager; and (d) evaluation sponsor. A committee of (a) parents; (b) administrators; (c) teachers; and (d) arts professionals managed the SPETRA+ sites.

The population of the study consisted of 615 students from grades two, four, and five participated in the study from two demographically comparable districts (Luftig, 1992). The goal of the SPECTRA+ program was to provide all students with one hour of daily instruction in (a) music; (b) dance; (c) art; or (d) graphic arts.

The SPECTRA+ committee members made curricular decisions based on the mission statement: (a) the arts are of equal importance to other subjects; (b) the results of the program should raise academic achievement and mental health by measuring the behaviors connected to self-esteem, self-expression, and creativity; (c) the schools and community would benefit from more positive relations because of the arts; and (d) the program would include evaluation as part of its guiding principles (Luftig, 1992).

The first-year study examined SPECTRA+ program’s effects on students in five areas: (a) creativity; (b) self-esteem; (c) math achievement; (d) reading achievement; and (e) appreciation for the arts. The hypotheses of the study were tested under three types of programming: (a) SPECTRA+; (b) a modified control group (participated in a whole language program that did not include the arts); and (c) a full control group (participated in a traditional curriculum).

The study used the following forms of measurement: (a) the Culture-Free Self-Esteem Inventory to test self-esteem; (b) the Bialer-Cromwell Locus of Control Scale for locus of control; (c) the Arts Appreciation Scale to measure appreciation for the arts; and (d) the Iowa Tests of Basic Skills and Stanford Achievement Tests for academic achievement. The results were reported by (a) program type; (b) grade; and (c) gender.
The research measured group differences through pretests and posttests, and standard statistical measures were incorporated to ascertain the impact and relationship among variables. The data from pretest achievement was gathered at the end of 1991-19992, and the posttest data was collected in the spring of 1993 (Luftig, 1992).

“Real world” limitations somewhat affected the SPECTRA+ study. The following are examples of limitations discovered in the research: (a) two schools used different standardized tests; (b) not all the children in every area were tested; (c) math achievement was only explored with fifth graders; and (d) comparison between districts was not feasible, and only SPECTRA+ and the full group were compared, out of District B (Luftig, 1992).

The results from the first year supported how creative thinking and appreciation for the arts are developed through SPECTRA+. The most gains in reading, reading vocabulary, and reading comprehension came from SPECTRA+ students in District B. However, there were no differences that surfaced from District A concerning the reading measures. The SPECTRA+ students from District B also scored higher in math than the control group. District A students scored highest on math comprehension (see Charts 3 and 4) (Luftig, 1992).
An unanticipated result from the study was that SPECTRA+ student did not perform higher on overall total self-esteem, although students in the arts-orientated program demonstrated positive effects in developing “parental self-esteem”; how students believe parents perceive them. There was no disparity between the groups on locus of control.
During Year Two of the SPECTRA+ evaluation, Luftig (1992) examined 230 second and fourth graders utilizing the same measures and procedures as the previous year. The fifth grade students who had partaken in the first phase of the research continued on to middle school, and were not a part of the second study. The results for Year Two have not been published, and the author only provided the preliminary findings. The students maintained gains in the preliminary results and continued to improve in: (a) creativity; (b) self-esteem; (c) math achievement; (d) reading achievement; and (e) appreciation for the arts.

Recommendations for further research included: (a) additional follow-up with SPECTRA+ students; (b) investigate whether the program would be successful with middle and high school students; (c) perform ethnographic studies to explore more closely which aspects of SPECTRA+ contribute most to student gains; and (d) expand upon the current SPECTRA+ program in place (Luftig, 1992).

**Impact of Music Training on Spatial-Temporal Reasoning**

Grandin, Peterson and Shaw (1998) reported on experiments by Leng and Shaw (1991) designed to determine whether or not music could enhance reasoning skills. The researchers explored how certain music could advance thinking and reasoning skills, along with creativity. The behavioral experiments of Leng and Shaw (1991) set out to test the hypothesis of whether music training at a young age would increase a child’s ability to incorporate pattern development in spatial-temporal reasoning.

“The Mozart Effect” originated from behavioral experiments that established connections between listening to a Mozart Sonata for Two Pianos in D Major versus
controls produced. The music of Mozart was chosen since the researchers anticipated that Mozart must have been employing the intrinsic array of spatial-reasoning firing patterns in the brain's cortex, since the composer started playing music at the age of four. Mozart's exact sonata was preferable due to the symmetry features and natural pattern sequences.

Spatial-temporal reasoning (ST) is fundamental for understanding mathematical concepts, particularly for proportional reasoning. Hence, the conventional language-analytical (LA) methods are less effective in teaching proportional reasoning. Relying too greatly on LA reasoning and not enough of ST thinking interferes with the learner's ability to solve global problems (Leng and Shaw, 1991).

The two forms of reasoning skills are ST and language-analytic. The principal reasoning features incorporated in spatial-temporal reasoning are: (a) modifying and connecting mental images in space and time; (b) incorporating symmetries of the "inherent cortical firing patterns" used to compare physical and mental pictures; and (c) including natural temporal sequences of the intrinsic cortical patterns. The essential component of spatial-temporal reasoning is the columnar network's innate ability to sequentially identify the symmetry relations in cortical firing patterns, referred to as "pattern development" (Leng and Shaw, 1991, p. 12).

The mental processes in pattern development may last anywhere from ten seconds to minutes, whereas pattern recognitions processes may be accomplished in a fraction of a second. The concept of pattern development is required in producing music, while ST is necessary for creating mental images even without external sensory input (Leng and Shaw, 1991).
Certain mathematical and scientific concepts, that tend to be complex to teach, may be more easily addressed in the curriculum by implementing short-term reasoning skills from a young age. Consequently, Leng and Shaw (1991) advocated that music instruction could heighten the brain’s “hardware” for more efficient ST reasoning ability.

Leng and Shaw’s theory (1991) led to behavioral experiments testing the hypothesis that music training at an early age could enhance children’s ability to use pattern development in ST activities. Seventy-eight pre-school children participated in the study where each child received private keyboard lessons for six months. There were three control groups who were instructed in computers instead. The children took four standardized age-appropriate special reasoning tests at the beginning and end of the study. One of the tests assessed ST, while the other three tested spatial-recognition reasoning.

The results of Leng and Shaw’s work inspired Rauscher and Shaw (1997) to conduct research on the short-term enhancements of spatial-temporal reasoning with older college students. The results of the Mozart Effect experiments showed that college students scored substantially higher on ST after having listened to the Mozart Sonata for Two Pianos in D Major. The effects were not as evident with the control group that listened to: (a) silence; (b) dance music; or (c) a recited story. The surface brain wave or (EEG) recordings taken from the subjects listening to Mozart demonstrated increased synchrony of neural firing activity in the right frontal and left temporo-parietal cortical areas of the brain. Hence, the result of the study was a causal link for music developing a short-term enhancement of spatial reasoning (Leng and Shaw, 1991).
A weakness in the study was that the duration of the enhancement of spatial-temporal reasoning was not determined. Recommendations for future research could include explore the different types of music that may produce similar effects as the Mozart effect.

**The Imagination Project at UCLA**

The Imagination Project at UCLA enlisted the National Educational Longitudinal Survey over a 10-year period to track the development of 25,000 students between eighth and twelfth grade. A 10-year average of Berkeley scores placed its students close to the 98th percentile, while the average student was in the 90th percentile. Generally, students scored one to two grade levels above average. The high test scores resulted from a combination of a strong arts curriculum and the individualized instruction students received in small classes.

A sample population was chosen to serve as a representation of the United States' population of secondary students. The panel study examined two phases of work: (a) the general involvement in the arts across all disciplines; and (b) the potential importance of sustained involvement in the disciplines of music and theatre (Caterall, Chapleau, and Iwanga, 1999). The chief confounding variable in the study was student family background, which was consistently and reasonably accounted for throughout the study.

The primary purpose of the arts is to expand access to meaning by presenting students with innovative ways of thinking and by reaching the variety of student intelligences and abilities. The skills in the various arts themselves are: (a) competencies as critics of art forms; (b) aesthetic awareness; (c) appreciations of one’s own rights; and (d) newly found powers to see and express (Caterall, Chapleau, and Iwanga, 1999). The
researchers chose music and drama as the art areas of focus because of the related research that suggested links between music and cognitive development at younger ages, and because of the related research on drama in education (Caterall et al., 1999).

The first phase involved a draft study of the effects of involvement in the visual and performing arts on student achievement. The study, released in 1997, was the first to report an analysis of information in the NELS: 88 surveys about student participation in the arts. The grants for the Imagination Project at UCLA from the GE Fund supported extensions of the research in December of 1998. The newly-funded work set three general priorities for further research: (a) to extend the analyses describing developments up to the 10th grade and beyond; (b) to conceptualize involvements in the arts in order to grasp the value of involvement in a single arts discipline compared to diverse participation in the arts; and (c) to explore connections between partaking in music and cognitive development.

The 1998-1999 research from the Imagination Project extended its earlier research in three areas: (a) the effects of involvement in the arts through 12th grade; (b) the intensive involvement within an arts discipline; and (c) the impacts of intensive involvement in theatre from eighth to twelfth grade. The purpose of the research was to examine the non-arts outcomes of engagement in the arts. The three general priorities of the research were to: (a) capture the potential values of in depth involvement in the arts; (b) explore potential connections between the study of music and cognitive development; and (c) examine the effects of students who reported continuous involvement in theatre. The researchers’ convictions concerning causation being involved depended greatly on
three elements of the research: (a) sound theory; (b) supportive evidence; and (c) ruling out rival explanations.

The findings may be summarized in three major sets of observations: (a) involvement in the arts and academic success; (b) music and mathematics achievement; and (c) theatre arts and human development. First, there was evidence of a sound theory consistent with statements concerning how the arts made a difference. The second element was the observational data supported the causal theory. If there was no empirical link between participation in the arts and an outcome, it would be difficult to argue causality. Causation would not be supported without substantial correlation. Thirdly, the elimination of the rival hypotheses occurred by restricting the groups to low SES students so that the differences in family background did not be drive the observed differences (Caterall, Chapleau, and Iwanga, 1999).

The research found substantial and significant differences in (a) achievement; (b) attitudes; and (c) behavior among youth highly involved in the arts with those who had little or no engagement in the arts, regardless of students' socio-economic status (see Figure 13) (Caterall et al., 1999).

<table>
<thead>
<tr>
<th>Figure 13. Probability of High vs. Low Arts Involvement by Student SES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability of High Arts Involvement</td>
</tr>
<tr>
<td>High SES Quartile</td>
</tr>
<tr>
<td>Low SES Quartile</td>
</tr>
<tr>
<td>Probability of Low Arts Involvement</td>
</tr>
<tr>
<td>High SES Quartile</td>
</tr>
<tr>
<td>Low SES Quartile</td>
</tr>
<tr>
<td>(Catterall, 1999)</td>
</tr>
<tr>
<td>Low SES Quartile</td>
</tr>
</tbody>
</table>

Source: Catterall (1999)
The general trends of achievement differences illustrated how involvement in the arts became a relative advantage that increased significantly over time. Figure 14 reveals patterns of participation for low SES students involved in the arts over time were similar to those shown for all students. The probability of being “highly involved in the arts” remained almost twice as high for students from economically advantaged homes. Consequently, the chances of students having little involvement in the arts were twice as much coming from an economically disadvantaged family (Caterall et al., 1999).

Twenty of the differences favoring the arts involved students at the $p<.001$ level, while four of the differences were significant at the $p<.01$ level (Caterall et al., 1999). Figure 14 displays the results of the panel study that provided evidence into how parent income and education levels did not determine success in the arts.
Youngsters involved in the arts performed comparatively better on multiple measures as they passed from eighth to twelfth grade (Catterall et al., 1999). There was also a noticeable decrease in the amount of time children spent watching television with those students involved in the arts. The comparative gains for students involved in the arts became more pronounced over time, holding true for students from low socioeconomic and low parent-education level homes (see Figures 17 and 18).
### Figure 15. Involvement in the Arts and 8th Grade Academic Performance

<table>
<thead>
<tr>
<th>% in each group</th>
<th>High Involvement</th>
<th>Low Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earning mostly As and Bs in English</td>
<td>82.6%</td>
<td>67.2%</td>
</tr>
<tr>
<td>Top 2 quartiles on std. tests</td>
<td>67.3%</td>
<td>49.6%</td>
</tr>
<tr>
<td>Dropping out by grade 10</td>
<td>1.4%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Bored in school half or most of time</td>
<td>37.9%</td>
<td>45.9%</td>
</tr>
</tbody>
</table>

Source: Catterall (1999)

### Figure 16. Involvement in the Arts, Academic Performance, Attitudes, and Low SES Students

<table>
<thead>
<tr>
<th>8th Grade</th>
<th>% in each group</th>
<th>High Involvement</th>
<th>Low Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Top 2 quartiles std tests</td>
<td>37.7%</td>
<td>29.8%</td>
</tr>
<tr>
<td></td>
<td>Mostly As and Bs in English</td>
<td>71.4%</td>
<td>58.8%</td>
</tr>
<tr>
<td></td>
<td>Dropping out by grade</td>
<td>10.3%</td>
<td>6.5%</td>
</tr>
<tr>
<td></td>
<td>Bored in school half/ most of time</td>
<td>32.9%</td>
<td>40.1%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10th Grade</th>
<th>% in each group</th>
<th>High Involvement</th>
<th>Low Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Top 2 quartiles std tests</td>
<td>35.2%</td>
<td>28.1%</td>
</tr>
<tr>
<td></td>
<td>Top 2 quartiles reading</td>
<td>37.3%</td>
<td>28.7%</td>
</tr>
<tr>
<td></td>
<td>Level 2 Reading Proficiency</td>
<td>39.6%</td>
<td>29.2%</td>
</tr>
<tr>
<td></td>
<td>Top 2 quartiles History/</td>
<td>34.8%</td>
<td>30.4%</td>
</tr>
<tr>
<td></td>
<td>Geography/Citizenship</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12th Grade</th>
<th>% in each group</th>
<th>High Involvement</th>
<th>Low Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Top 2 quartiles std tests</td>
<td>30.9%</td>
<td>23.4%</td>
</tr>
<tr>
<td></td>
<td>Top 2 quartiles reading</td>
<td>32.9%</td>
<td>23.6%</td>
</tr>
<tr>
<td></td>
<td>Top 2 quartiles History/</td>
<td>30.7%</td>
<td>25.2%</td>
</tr>
<tr>
<td></td>
<td>Geography/Citizenship</td>
<td>37.9%</td>
<td>30.4%</td>
</tr>
<tr>
<td>Level 2 or 3 Reading Proficiency</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Catterall (1999)

The connection between the arts and academics revealed that students involved in the arts were more successful in school than those who were not involved (Catterall et al., 1999). Positive developments for children engaged in the arts were demonstrated at each step in the research, from eighth, tenth, and twelfth grade. The relative advantage for middle and high school students to be involved in the arts was most significant between grades 10 and 12 (see Figure 17).
Figure 17. Percentages of Students Involved in Arts Related Activities Reported in the NELS:88 Data Base, Grade 12 vs. Grade 10.

<table>
<thead>
<tr>
<th></th>
<th>Grade 12</th>
<th>Grade 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participates in:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School Music Group</td>
<td>19.5%</td>
<td>Band or Orchestra</td>
</tr>
<tr>
<td>School Play/Musical</td>
<td>15.0</td>
<td>Chorus or Choir 23.3%</td>
</tr>
<tr>
<td>Takes out-of-school classes in Music, Art, or Dance:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rarely or never</td>
<td>85.9%</td>
<td></td>
</tr>
<tr>
<td>less than 1/week</td>
<td>4.2</td>
<td>less than 1/week 5.8</td>
</tr>
<tr>
<td>1-2 per week</td>
<td>7.4</td>
<td>1-2 per week</td>
</tr>
<tr>
<td>every day or almost</td>
<td>2.5</td>
<td>every day or almost 11.3</td>
</tr>
</tbody>
</table>

Source: Catterall (1999)

Among 10th-graders, 47.5% of students with low involvement in the arts scored in the top half of standardized tests, while 65.7% of those with high arts involvement scored above the test median. The students, who attended classes that combined two to three grades, received 1 1/2 hours of art, 1 1/2 hours of music and 2 1/2 hours of dance each week. Students performed three shows a year, including a Shakespearean production (see Figures 18 and 19).

Figure 18. Involvement in the Arts and 10th Grade Academic Performance

<table>
<thead>
<tr>
<th>% in each group</th>
<th>High Involvement</th>
<th>Low Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involvement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top 2 quartiles std. tests</td>
<td>65.7%</td>
<td>47.5%</td>
</tr>
<tr>
<td>Top 2 quartiles Reading</td>
<td>64.7%</td>
<td>45.4%</td>
</tr>
<tr>
<td>Level 2 (high) Reading Proficiency</td>
<td>61.0%</td>
<td>43.5%</td>
</tr>
<tr>
<td>Top 2 quartiles Hist./Geog./Cit.</td>
<td>62.9%</td>
<td>47.4%</td>
</tr>
</tbody>
</table>

Source: Catterall (1999)
Students who were consistently involved in instrumental music in middle and high schools demonstrated higher levels of proficiency in math by twelfth grade, remaining true for economically disadvantaged students also.

The researchers from the Imagination Project selected the area of music and cognitive development as a way of further exploring the link between the recent studies in neuroscience that supported music training as having a positive effect on cognitive functioning (Shaw and Rauscher, 1993). Sustained contributions to theatre arts were selected due to the research and scholarly writing from Great Britain over the past several decades (Heathcote, 1984).

Students' involvement in the 8th through 12th grade declined between 10th and 12th grade from 22.7% in 10th grade to 23.3% in 12th grade, with fewer than 20% of students in any school involved in music (see Figure 20).
The results also supported a solid link between music and achievement in mathematics. Those students who were consistently involved in music over the middle and high school years showed significantly higher levels of mathematical proficiency by the 12th grade, again remaining the same for students from low socioeconomic and low parent-education level homes.

In Figure 23, math proficiency developments were illustrated for the low 206 SES students who were intensively involved in instrumental music between eighth and twelfth grade. By grade 12, the same 260 students outperformed all low SES students without music at high levels of mathematics by a factor greater than two to one (see Figures 21 and 22).
| Figure 21. Math Proficiency Scores at Grade 8, Percentages Scoring at Each Level |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|
| Math Proficiency Scores         | Average         | Average-Low SES | No Music-Low SES | Orch/Band-Low SES |
| v                               | N = 14,915      | N = 7,052       | N = 1,216       | N = 260         |
| Below 1                         | 15.3            | 20.8            | 16.4            | 10.8            |
| Level 1                         | 34.7            | 41.1            | 42.1            | 36.9            |
| Level 2                         | 20.3            | 17.8            | 19.7            | 20.4            |
| Level 3                         | 19.0            | 8.6             | 10.7            | 21.2            |

Source: Catterall (1999)

| Figure 22. Math Proficiency Scores at Grade 12, Percentages Scoring at Each Level |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|
| Math Proficiency Scores         | Average         | Average-Low SES | No Music-Low SES | Orch/Band-Low SES |
| v                               | N = 14,915      | N = 7,052       | N = 1,216       | N = 260         |
| Below 1                         | 4.7             | 6.4             | 5.3             | 1.9             |
| Level 1                         | 14.8            | 20.9            | 22.8            | 12.7            |
| Level 2                         | 8.9             | 10.5            | 13.1            | 13.5            |
| Level 3                         | 15.6            | 14.6            | 21.1            | 20.8            |
| Level 4                         | 18.3            | 10.9            | 14.5            | 30.4            |
| Level 5                         | 3.0             | .9              | 1.0             | 2.7             |

Source: Catterall (1999)

By 12th grade, those students who were consistently involved with instrumental music scored significantly higher on math tests. The findings held true for students regardless of parents' income, occupations, or level of education.

Those students who consistently acted in plays and musicals, joined drama clubs or who took acting lessons, showed gains in reading proficiency, self-concept and motivation. Sustained student involvement in theatre was associated with the following developments: (a) gains in reading proficiency; (b) increase in motivation; (c) stronger self-concept; and (d) higher levels of tolerance and empathy for others.
The outcome of students involved in the theatrical arts resulted in both academic and developmental gains. Students made gains in reading proficiency, motivation, self-concept, and empathy for others. The achievement differences between high and low involvement in the arts were significant for economically disadvantaged students as well.

The weaknesses of the study included the study being unable to: (a) explain the differences shown in achievement; and (b) attribute students' successes unequivocally to the arts. Panel studies do not tend to be conducive to unequivocal causal modeling.

In conclusion, the use of the arts as a foundation for developing the necessary literacy skills required to succeed on standardized tests has progressed beyond the inherit value of the arts in the classroom. Students from impoverished backgrounds who score low on standardized tests benefit from a tri-fold approach which includes: (a) effective test-preparation instruction; (b) a student-centered approach to learning; and (c) connections between thematic units of study to the arts.

**Chicago Arts Partnerships in Education- CAPE**

The purpose of the research conducted by Catterall from the Imagination Project at UCLA was to establish an arts integrated academic program that would: (a) investigate a specific group of evaluation-related questions for the 1998-1999 school year; (b) join local artists and art agencies into partnerships with classroom teachers at every grade level; (c) report on the development of CAPE and its effects on students over its first six years; and (d) record the measurable effects of CAPE on student learning. The “teacher-artist” partnership would be responsible for: (a) planning the integrated instruction; and (b) connecting art instruction with academic subjects program to build upon (Catterall, 1999).
The Chicago Arts Partnership in Education (CAPE) was established in 1992 from the rise of awareness and financial support available for the arts in Chicago Public Schools. CAPE signed a contract with the North Central Regional Laboratory (NCREL) to provide evaluation services, interim reports, and one final report.

NCREL and the Imagination Project accumulated data on student achievement in reading and mathematics from 1992 through 1998: (a) national basic skills tests and (b) the Iowa Test of Basic Skills or ITBS. The NCREL’s focus was on the percentage of students performing at or above grade-level on tests administered between 1991 and 1998. NCREL implemented large-scale surveys of teachers and students with the aim of: (a) attaining an overall portrait of the CAPE program; (b) generating a general view of CAPE practices; and (c) discerning what a successful arts integrated program would look like and what the positive outcomes from such a program might be (Catterall, 1999).

The NCREL’s evaluation worked in three main stages: (a) examining the activities taking place in the planning years to see what was successful and what needed improvement; (b) measuring the impact of CAPE on artists, teachers, and students during implementation; and (c) determining the support from schools and the community.

The Imagination Project: (a) reviewed the data from the ITBS test scores between 1992 and 1998; (b) produced comparisons between CAPE and non-CAPE schools; and (c) analyzed scores from the Illinois Goals Assessment Program (IGAP) test, which reflected state standards in the academic subject areas. The Imagination Project’s evaluation: (a) produced descriptions of typical classroom practices; (b) focused its attention on the best integrated curricular practices; and (c) surveyed selected artist-teacher partnerships concerning their integrated lessons and classrooms (Catterall, 1999).
The 1998-1999 evaluation of student achievement performed by The Imagination Project revealed a total of 52 test score analyses of the CAPE program with comparison schools in the Chicago Public School System (CPS). The comparison included: (a) comparison at the 3rd, 6th, 8th, 9th, 10th, and 11th grade levels; (b) half of the comparisons involved all CAPE schools versus all Chicago Public Schools, while the other included only high poverty schools to reduce school samples by one-fourth; (c) CAPE schools compared to a set of matched schools determined by NCREL; (d) each test reports percentages of students above norm (AB) with an average grade equivalent score (GE) corresponding to the number of question answered correctly; and (e) 52 separate comparisons showing a grade level, specific test, high or low poverty level, and two sets of comparative scores.

Small clusters of schools applied for grants to participate in CAPE. Out of the 64 submitted proposals, 14 were funded and the CAPE program began. During its full implementation, CAPE involved 12 clusters of 37 schools, 53 professional arts organizations, and 27 community organizations. Three-fourths of all sample schools included high poverty schools. During the first six years of the CAPE program, 20 schools remained active and committed (Catterall, 1999).

The NCREL used district-wide teacher and student surveys to track the development of CAPE schools. CAPE schools outscored non-CAPE schools in regards to: (a) professional development; (b) instructional practices; (c) relationships with the community and parents; and (d) school climate.

The NCREL findings based on its evaluation of the impacts of CAPE on students learning were highlighted in four main categories: (a) impacts of CAPE on the classroom;
The effects of CAPE on teachers and artists; (c) results on students; and (d) support from schools and community arts groups. The NCREL reports, based on the 1997-1998 survey of how teachers addressed instruction and the curriculum revealed: (a) more than 90% of teachers reported moderate (57%) or extensive (26%) integration of CAPE; (b) 54% of teachers developed one integration unit and 24% created between four and five units; (c) visual arts was the most popular art form, which teachers devoted to implementing 41% of the time; and (d) reading as being the subject area most focused on in interdisciplinary units (see Figure 23).

**Figure 23. Proportion of Time Instruction Focus on Specific Areas of the Arts**

Source: Catterall (1999)

The NCREL evaluated teachers and artists for over four years by: (a) administering regular surveys; (b) observing classrooms; (c) interviewing both teachers and artists; (d) providing focus groups; and (e) conducting case studies. The most substantial impact CAPE had on teachers included: (a) high levels of teacher-artist collaboration in
preparation and instruction, with 91% of teachers involved; (b) high levels of participation in the creation and implementation of teaching units; and (c) CAPE professional development workshops, although a typical teacher only attended one to three of the 11 sessions offered (Catterall, 1999).

The teacher survey presented estimates concerning which subject areas both teachers and artists preferred to focus on in the interdisciplinary units. The most popular subject area to integrate the arts with was reading, followed by social studies. Science was integrated less in CAPE units, and mathematics was the least frequently chosen of all the subject areas (see Figure 24). (The numbers one through four in Figure 12 were assigned in order to measure the average levels of arts integration among the participating teachers, with the average scores shown over each column).

**Figure 24.** Arts Integration in Four Subject Areas According to CAPE Teachers and Artists

<table>
<thead>
<tr>
<th>Subject Area</th>
<th>Very Integrated</th>
<th>Moderately Integrated</th>
<th>Somewhat Integrated</th>
<th>Not Integrated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>3.0</td>
<td>3.4</td>
<td>2.9</td>
<td>2.5</td>
</tr>
<tr>
<td>Social Studies</td>
<td>3.0</td>
<td>3.4</td>
<td>2.9</td>
<td>2.5</td>
</tr>
<tr>
<td>Science</td>
<td>3.0</td>
<td>3.4</td>
<td>2.9</td>
<td>2.5</td>
</tr>
<tr>
<td>Math</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Catterall (1999)
The NCREL reported on the impact on students in three areas: (a) positive student attitudes concerning arts integrated instruction, with 94% of elementary, 50% of middle school students, and 86% of high school students responding that it made learning fun; (b) no differences in student motivational scales, the differences between CAPE and non-CAPE students were not statistically significant enough; and (c) emerging positive trends in ITBS scores, although the gap in reading and math scores became wider between 1996 and 1997 the difference were not statistically significant. The 1998 data included differences that favored CAPE that became significant for the ITBS and Illinois state IGAP test (Catterall, 1999).

A survey of artists and teachers was conducted in 1997-1998 to rank the support of the school and community. The results of the survey showed that principals were regarded as highly supportive of CAPE, with principals rating 3.64 out of four possible points. The arts organizations were also highly supportive of CAPE due to employment opportunities that CAPE brought to the arts community (see Figure 25).

**Figure 25. Teachers’ and Artists’ Ratings of School and Community-Based Support for CAPE**

Source: Catterall (1999)
The NCREL’s conclusions, based on five years of observations, included: (a) positive changes in school climate in terms of widespread decision-making and quality leadership; (b) support from principals; (c) collaboration of teachers and artists; and (d) belief that arts integration was valuable for children. There are three sample test score comparisons that help understand the impact CAPE had on student achievement in reading and math. None of the 52 comparisons demonstrated the Non-cape Schools outperforming CAPE schools.

The NCREL’s recommendations to CAPE included: (a) place arts integration as the mission of the school; (b) determine the criteria for assessing the arts and academic units; (c) establish a standards-based student assessment system to determine whether measurable outcomes have been met; (d) conclude ways to provide more planning and working time; (e) allocate additional resources to teachers; and (f) enhance CAPE’s position in school reform (Catterall, 1999).

The Imagination Project identified three critical conditions from the analyses of the full evaluation report: (a) examples in cases of CAPE students outperforming non-CAPE students resulting in more significant gains over time; (b) cases of larger CAPE advantages during the implementation rather than planning years; and (c) CAPE schools’ performance grew since the planning years.

The most significant discovery of the Imagination Project’s research on CAPE was the gap favoring CAPE schools increased over time. The success of the CAPE program on academics may be clearly seen at the elementary level and by sixth grade. The results for high schools differed since there were a small number of CAPE high schools that achieved statistical significance (Catterall, 1999).
A global assessment of CAPE student achievement demonstrated a strong case for the CAPE program in terms of its effects on reading and math at the 6th grade level with sizeable and significant gains (see Figure 26).

**Figure 26. CAPE vs. All Chicago Elementary Schools, Grade 6 ITBS Math, Percentage above Grade Level**

[Graph showing comparison of CAPE and All Chicago Elementary Schools, 1992-1998.]

Source: Catterall (1999)

Twenty-five reading test comparisons out of 40 in grades K-8 showed that CAPE schools increased over competition schools. The graph in Figure 4 showing prior to CAPE, CPS schools averaged around 28% at or above grade level with CAPE schools averaging about 40%. By 1998, more than 60% of CAPE 6th graders were performing at or above grade level on the ITBS, while the other schools averaged 40%. Similar results may be found true in reading. The difference favoring CAPE schools grew 14 percentage points by 1998. However, all schools increased their performance on the ITBS sixth grade-reading test over the years from 1992-1998 (see Figure 27).
Reports from 9th grade test results in Figure 16 showed that both groups of schools started out at low 8th grade levels and coincided at the 8th grade between 1994 and 1995. By 1998, CAPE 9th graders averaged 9th graders’ fifth month performance in reading, whereas the comparison schools averaged a full grade level lower with 8th grade in the fifth month (see Figure 28).
Two patterns surfaced in the responses support that participants believed: (a) CAPE arts-integrated lessons were adding to important skills and (b) non-integrated classes differed systematically from arts-integrated classes. Nine out of the 12 skill areas showed more progress and direction during CAPE lessons rather than in non-integrated ones. Figure 29 showed how the respondents to the surveys perceived development in the areas outlined in the chart (Catterall, 1999).
The nature of a high quality integrated arts curriculum was investigated by choosing a select sample of 10 experienced teacher-artist pairs. Based on the respondents’ responses, the Imagination Project determined the following areas constituted an effective arts integrated program: (a) integration of the arts from the goals and standards of the academic curriculum and (b) the arts filled a partnership role in teaching and learning.
The following criteria was brought forth from interviews and observations of teachers, artists, principals and coordinators: (a) children made connections and walked away with bigger ideas; (b) students took their work seriously; (c) content was revealed through more forms than traditional writing and speaking; (d) content lesson and artistic one were of equal importance; (e) planned assessments were administered as part of the experience with rubrics or scoring guides; and (f) lesson plans grew from state curriculum standards in content and artistically.

All lesson plans examined form the interviewed teachers and artists contained five features: (a) planning for an artistic product; (b) academic goals connected to stage goals; (c) art objectives; (d) objectives connected to state art goals; and (e) assessment of children’s learning.

The same respondents to the survey provided the following responses concerning what actually creates high quality arts-integrated instruction: (a) supportive principals; (b) skilled artists; (c) risk-taking teachers; (d) well-defined learning objectives; (e) objectives connected to assessment plans; (f) convenient scheduling for artists; (g) teachers chose preferred art forms; (h) shared practices in faculty meetings; and (i) a solid steering committee.

The weakness of the Imagination Project is that it cannot determine which specific factors contributed to the differences in performance measures that reveal statistical strengths in CAPE schools.

Recommendations for future research include: (a) a longitudinal study tracking the effect the arts in CAPE had on participants; (b) follow-up studies on the effect
performing, public speaking, and taking risks have on student achievement; and (c) the reporting of the results from expanding the CAPE program nation-wide.

Research on SAT Scores of Students Who Study the Arts

Vaughn and Winner (2000) studied ten years of data relating SAT scores to the following types of arts classes: (a) acting; (b) play production; (c) theater appreciation; (d) studio art and design; (e) art history; (f) dance; (g) music history; and (h) instrumental or vocal music. The purpose of this particular study of data was to determine whether or not the type of art form made a difference in student achievement.

The College Board has been documenting the relationship between arts courses and SAT scores since 1987 by collecting a large sample of all students who took the SAT, and who voluntarily answered questions to the Students Descriptive Questionnaire (SDQ), during the registration process. The College Board considers the data to be “nearly a complete and accurate description of the tested population” (Vaughn & Winner, 2000, p. 1). Ninety-four to 95% of all students taking the SAT filled out at least one item on the SDQ.

The SDQ listed examples of the arts as being the following: (a) music; (b) art; (c) art history; (d) dance; and (e) theatre. Vaughn and Winner (2000) then compared the scores of students who had taken between zero and four years of arts courses. The researchers treated each year’s score as an independent observation with: (a) twelve observations showing from 0-3 years of art courses taken; (b) eight observations with four+ years of arts courses; and (c) the same levels were incorporated for analyses on verbal and math SAT scores, which were reported on later.
Vaughn and Winner (2000) analyzed: (a) the mean scores of students’ responses to questions on the SDQ; (b) the College Board data to answer an array of comparative questions; and (c) twelve years of available SAT data from 1987-1998 as the “between-subjects factor.” The higher scores between 1996 and 1998 were re-centered. Therefore, these scores were converted back to their original scale to make scores comparable across the years. This comparable analyses was then repeated three times, once for the composite scores and the again for the verbal and math scores separately. The purpose for separating the analysis was to determine which type of score tended to be more highly associated with a particular art study.

The scores gradually increased with each level of arts from 0-3 years, and then sharply rose after four years of arts study. The one-way ANOVA with levels of experience in the arts as the between-subject factor disclosed a substantial effect of level of arts experience, $F(5,60) = 93.977, MSE = 93.791, p < .0001$. The mean composite scores from students with various levels of arts courses are shown in Figure 30.
A comparison analysis showed evidence of students' scores with 0-3 years of arts experience to be considerably lower than scores of students with 4+ years of experience in the arts with $F(1,60) = 426.544, \text{MSE} = 83.791, p < .0001$. The contrast noted accounted for 91% of the variability across the different levels of arts education.

Subsequently, a trend analysis was completed on students' scores with 0-3 years of arts classes. The error term from the original ANOVA was implemented for this analysis and other tests for trend components. A noteworthy linear component was discovered, $F(1,60)=43.009, \text{MSE}=83.791, p < .0001$, supporting the fact that composite SAT scores trend to increase linearly from 0-3 years of arts experience, while rising sharply at four years. Scores of students with over four years of arts experience are
slightly lower than those with four years, hence a post-hoc-t-test showed that the mean scores of students with 4+ years of arts courses were not reliably different, $p > .05$ (Vaughn and Winner, 2000).

The one-way ANOVA showed a significant effect of level of arts experiences, $F(5,60) = 167.960$, $MSE = 18.02$, $p < .0001$. A contrast analysis affirmed scores of students with 0-3 years of arts experience to be significantly lower than the scores of students with 4+ years, $F(1,60) = 715.824$, $MSE = 18.021$, $p < .0001$. This contrast was responsible for 85% of the variability across the different art levels. Figure 31 reveals the relationship between verbal SAT scores and years of high school exposure to the arts.
Figure 31. Verbal SAT Scores as a Function of High School Arts Courses

Source: Vaughn and Winner (2000)
A trend analysis was then performed on scores of students with zero to three years of arts that revealed a significant linear component, $F(1,60)=132.844$, $MSE = 18.021$, $p < .0001$. As a result, of no other component accounting for any significant amount of variance, verbal SAT scores increased linearly from 0-3 years of arts exposure and subsequently rise dramatically at four years. A post-hoc-t-test showed that scores of the two groups of students were not reliably different, $p > .05$ (Vaughn and Winner, 2000).

The mean math SAT scores earned by students with different levels of arts courses may be seen in Figure 20. The results reveal a strong discontinuity between three and four years, as with the composite and verbal scores. A one-way ANOVA disclosed a noteworthy effect on levels of art experience, $F(5,60)= 30.175$, $MSE= 39.438$, $p<.0001$. The contrast analysis showed that those students with zero, one, two, and three years of arts experienced resulted in being significantly lower than the scores of students with four and over years of experience, $F(1,60)=144.434$, $MSE=39.438$, $p<.0001$. The contrast accounted for 96% of the variability across the different levels of arts education.

Vaughn and Winner (2000) combined scores meta-analytically for verbal and math scores, with each meta-analysis based on ten years of SAT data from 1988-1998. A comparable analysis performed on ten years of math SAT data revealed a man weighted and unweighted effect size of $r=11$, with a 95% confidence interval of $r=.08$ to $r=.13$ (Stouffer's $Z=206.70$, $p<.001$) (see Figure 32).
Figure 32. Math SAT Scores as a Function of High School Arts Courses

Source: Vaughn and Winner (2000)
The growth of the effect sizes is not related to re-centering the scores, since the effect sizes were computed on scores that had been adjusted back to the non-centered scores. The effect sizes for math remain consistently less significant than those for verbal scores. Figure 33 illustrates the rise in the effect sizes for verbal and math scores over ten years.

Figure 33. Effect Sizes Comparing Zero to Four Years of Arts Courses for Ten Years of Verbal and Math SAT Data

Source: Vaughn and Winner (2000)
Acting and play production students earned the highest scores ($M=433$), while dance students earned the lowest ($M=433$). It should be noted that those students who did not participate in the arts at all acquired the lowest verbal scores ($M=401$). Next, the same procedure took place with math scores. This time, however, music theory and acting/play production students scored the highest with ($M=503$), and the dance students the lowest with ($M=474$). Once again, the students who did not participate in the arts earned the lowest math scores ($M=465$) (Vaughn and Winner, 2000). The verbal scores averaged over ten years were compared across the art forms (see Figure 34).
Figure 34. Ten Year Average of Mean SAT Scores Associated with Specific Arts Course Participation

Source: Vaughn and Winner (2000)
Vaughn and Winner (2000) used *t*-tests, performed separately for verbal and math scores, to compare the scores of students who did not participate in the arts to scores for each art area. Since all of the statistical comparisons proved to be noteworthy, the researchers concluded that the verbal and math SAT scores of students taking any form of art was notably superior to those student with no participation in the arts, regardless of how many years students participated in the arts (see Table 3 for verbal results and Table 6 for math results).

<table>
<thead>
<tr>
<th>Art Form</th>
<th>Mean</th>
<th>SD*</th>
<th>df</th>
<th><em>t</em></th>
<th>one-tailed <em>p</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>No Arts</td>
<td>400.7</td>
<td>2.95</td>
<td>18</td>
<td>48.44</td>
<td><em>p</em> &lt; .0001</td>
</tr>
<tr>
<td>Acting</td>
<td>465.2</td>
<td>3.01</td>
<td>18</td>
<td>48.44</td>
<td><em>p</em> &lt; .0001</td>
</tr>
<tr>
<td>Music History/Theory/Apprec</td>
<td>456.4</td>
<td>4.27</td>
<td>18</td>
<td>34.36</td>
<td><em>p</em> &lt; .0001</td>
</tr>
<tr>
<td>Drama Appreciation</td>
<td>454.3</td>
<td>2.75</td>
<td>18</td>
<td>42.05</td>
<td><em>p</em> &lt; .0001</td>
</tr>
<tr>
<td>Music Performance</td>
<td>447.6</td>
<td>3.80</td>
<td>18</td>
<td>31.28</td>
<td><em>p</em> &lt; .0001</td>
</tr>
<tr>
<td>Studio Art</td>
<td>443.6</td>
<td>2.63</td>
<td>18</td>
<td>34.87</td>
<td><em>p</em> &lt; .0001</td>
</tr>
<tr>
<td>Art History/Appreciation</td>
<td>441.0</td>
<td>3.43</td>
<td>18</td>
<td>28.16</td>
<td><em>p</em> &lt; .0001</td>
</tr>
<tr>
<td>Dance</td>
<td>433.1</td>
<td>2.84</td>
<td>18</td>
<td>25.56</td>
<td><em>p</em> &lt; .0001</td>
</tr>
</tbody>
</table>

Note: Standard deviations are calculated using each year as an instance for the particular art form.

Source: Vaughn and Winner (2000)
Table 4. *T*-Tests Comparing Mean Math SAT Scores over 10 Years: No Arts vs. Specific Arts Courses

<table>
<thead>
<tr>
<th>Art Form</th>
<th>Mean</th>
<th>SD</th>
<th>df</th>
<th>t</th>
<th>one-tailed p</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Arts</td>
<td>464.9</td>
<td>2.80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Music History/Theory/Apprec</td>
<td>503.7</td>
<td>8.12</td>
<td>18</td>
<td>14.28</td>
<td>p&lt;.0001</td>
</tr>
<tr>
<td>Acting</td>
<td>502.9</td>
<td>6.29</td>
<td>18</td>
<td>17.45</td>
<td>p&lt;.0001</td>
</tr>
<tr>
<td>Music Performance</td>
<td>497.2</td>
<td>7.31</td>
<td>18</td>
<td>13.04</td>
<td>p&lt;.0001</td>
</tr>
<tr>
<td>Studio Art</td>
<td>495.4</td>
<td>7.58</td>
<td>18</td>
<td>11.92</td>
<td>p&lt;.0001</td>
</tr>
<tr>
<td>Drama Appreciation</td>
<td>491.0</td>
<td>8.06</td>
<td>18</td>
<td>9.56</td>
<td>p&lt;.0001</td>
</tr>
<tr>
<td>Art History/Apprecation</td>
<td>489.2</td>
<td>5.67</td>
<td>18</td>
<td>12.15</td>
<td>p&lt;.0001</td>
</tr>
<tr>
<td>Dance</td>
<td>477.5</td>
<td>7.67</td>
<td>18</td>
<td>4.87</td>
<td>p&lt;.0002</td>
</tr>
</tbody>
</table>

Note: Standard deviations are calculated using each year as an instance for the particular art form.

Source: Vaughn and Winner (2000)

The list of the effect size is listed first, followed by the 95% confidence interval (indicating the interval with the average effect size of another sample of ten similar studies). The following column lists the Stouffer’s Zs, all with *p* levels of <.001, while showing that the results were generalizable to other samples of students (Vaughn and Winner, 2000). Further information regarding the strength of the mean effect size for each art form is illustrated in Tables 5 and 6.
### Table 5.
**Mean Weighted Effect Size for Verbal SAT Scores across Art Forms**

<table>
<thead>
<tr>
<th>Art Form</th>
<th>Effect Size 95% CI</th>
<th>Stouffer's Z</th>
<th>t-test of mean Zr</th>
<th>File Drawer Effect</th>
<th>Robustness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acting</td>
<td>.28 .27 to .30</td>
<td>571.81*</td>
<td>34.98*</td>
<td>1,208,277</td>
<td>11.1</td>
</tr>
<tr>
<td>Music History/Theory/Apprec.</td>
<td>.25 .24 to .27</td>
<td>463.30*</td>
<td>23.77*</td>
<td>793,231</td>
<td>9.3</td>
</tr>
<tr>
<td>Drama Appreciation</td>
<td>.24 .23 to .26</td>
<td>424.90*</td>
<td>34.34*</td>
<td>667,164</td>
<td>10.9</td>
</tr>
<tr>
<td>Music Performance</td>
<td>.19 .18 to .21</td>
<td>465.07*</td>
<td>23.60*</td>
<td>799,301</td>
<td>7.5</td>
</tr>
<tr>
<td>Studio Art/Design</td>
<td>.19 .18 to .21</td>
<td>387.68*</td>
<td>23.89*</td>
<td>555,415</td>
<td>7.6</td>
</tr>
<tr>
<td>Art History/Appreciation</td>
<td>.18 .17 to .20</td>
<td>367.43*</td>
<td>22.60*</td>
<td>498,905</td>
<td>7.2</td>
</tr>
<tr>
<td>Dance</td>
<td>.14 .13 to .16</td>
<td>265.51*</td>
<td>17.02*</td>
<td>273,524</td>
<td>5.5</td>
</tr>
</tbody>
</table>

* Significant at p<.0001.

Source: Vaughn and Winner (2000)

### Table 6.
**Mean Weighted Effect Size for Math SAT Scores across Art Forms**

<table>
<thead>
<tr>
<th>Art Form</th>
<th>Effect Size 95% CI</th>
<th>Stouffer's Z</th>
<th>t-test of mean Zr</th>
<th>File Drawer Effect</th>
<th>Robustness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acting</td>
<td>.16 .14 to .18</td>
<td>323.63*</td>
<td>15.72*</td>
<td>387,033</td>
<td>4.8</td>
</tr>
<tr>
<td>Music History/Theory/Apprec.</td>
<td>.16 .13 to .18</td>
<td>299.01*</td>
<td>12.33*</td>
<td>330,396</td>
<td>3.9</td>
</tr>
<tr>
<td>Music Performance</td>
<td>.13 .11 to .15</td>
<td>306.51*</td>
<td>17.02*</td>
<td>347,165</td>
<td>3.8</td>
</tr>
<tr>
<td>Studio Art/Design</td>
<td>.13 .11 to .15</td>
<td>256.38*</td>
<td>10.67*</td>
<td>242,892</td>
<td>3.4</td>
</tr>
<tr>
<td>Drama Appreciation</td>
<td>.11 .09 to .13</td>
<td>199.39*</td>
<td>9.43*</td>
<td>146,911</td>
<td>3.4</td>
</tr>
<tr>
<td>Art History/Appreciation</td>
<td>.10 .09 to .13</td>
<td>206.39*</td>
<td>12.15*</td>
<td>157,409</td>
<td>3.8</td>
</tr>
<tr>
<td>Dance</td>
<td>.06 .03 to .08</td>
<td>108.47*</td>
<td>4.45*</td>
<td>43,472</td>
<td>1.4</td>
</tr>
</tbody>
</table>

* Significant at p<.0001.

Source: Vaughn and Winner (2000)
The next column lists the t-tests of the mean Zr, which are significant at $p < .001$, generalizing the results to new studies. The file drawer column displays the number of new studies averaging null results, with mean probability levels of .50. The tables undoubtedly show a range of effect sizes from $r = .10$ (the relationship between art history and math scores) to $r = .28$ (the relationship between acting and verbal scores).

Effect size comparisons over ten years were then computed to compare the scores of students taking arts courses versus the scores of students who studied a particular form of art. Vaughn and Winner (2000) computed effect sizes separately for each art form since the groups were not independent.

Vaughn and Winner (2000) performed independent meta-analyses for each art form, with a total of 14 small meta-analyses, and compared the weighted average effect sizes produced by each one. The results of the analyses allowed the researchers to ascertain whether the relationship between math scores and the experience of taking a music course was stronger than the relationship between math scores and visual arts classes.

The mean weighted effect size illustrates the relationship between verbal and math SAT scores and participation in each of the arts in descending order. The effect sizes for verbal scores ranged from a high of $r = .28$ (acting) to a low $r = .14$ (dance). The effect sizes for math scores ranged from $r = .16$ (acting) to $r = .06$ (dance). A similar pattern was found in both verbal and math scores; however, the greatest relationship between scores and art form was in acting and the least was in dancing (see Figure 35).
The results conclude that students who take any form of art class in high school have higher SAT scores in both math and verbal than students who take no art courses at all. Furthermore, those students who take four years of art have higher scores than those who take less than four years of art classes. Nevertheless, one may not conclude that the findings support the notion that taking arts classes will automatically result in higher SAT
scores since the data is correlational and allows for no causal inference (Vaughn and Winner, 2000).

The possible explanations for higher SAT scores for students participating in the arts may be due to the following: (a) the arts lead to cognitive growth that reflects in higher SAT scores; (b) students who choose to study art happen to be higher achievers; (c) higher-achieving students come from families that value both academic achievement and the arts; (d) high academic achievers choose the arts because they think it will increase their chances of being accepted into more selective colleges; and (e) students who study the arts attend schools that are strong both artistically and academically.

**Learning through the Arts**

Learning through the Arts (LTTA) is a Canadian school-wide arts education approach to learning. The LTTA elementary education model involves teachers collaborating with professional artists, who work directly with students, to develop curriculum that integrates the arts with literacy. Canada had developed models to boost the level of arts literacy in its public schools, yet empirical research assessing the arts and literacy was scarce.

Smithrim and Upitis (2005) collected the following data at the outset and after three years of conducting an extensive empirical study on LTTA: (a) student achievement; (b) students' attitudes towards school and the arts; and (c) out-of-school activities. Smithrim and Upitis (2005) reported on the success of the LTTA program in terms of how well it revived the quality of elementary education in Canada as experienced by: (a) students; (b) teachers; (c) administrators; and (d) artists.
The purpose of the study was to: (a) complement and extend on previous research on arts education; and (b) present correlational and causal evidence of the relationship between the arts and academic achievement in particular subject areas. The following are ways in which the study completed its goals: (a) comparing LTTA schools with control schools that had a school-wide special curriculum focus and regular schools without one; (b) researching the effect of socioeconomic status on student achievement; and (c) searching for a connection between school achievement and attitudes towards school with out-of-school activities.

Winner and Cooper (2000) advised researchers to explore quasi-experimental designs for studies related to the arts and student achievement for the following reasons: (a) a great deal of research on the impact of the arts on learning is correlational in nature; and (b) researchers have the tendency of interpreting evidence as being purely causal. LTTA students were sampled from the 55 LTTA schools by the end of the third year.

The actual survey instruments for first through sixth grades were designed to: (a) determine students' attitudes towards school, the arts, and learning; and (b) gain information concerning students' activities and interests outside of school.

The quantitative tools included the following forms: (a) standardized achievement tests; (b) holistically scored writing samples; and (c) surveys reflecting practices and attitudes. The qualitative data incorporated in the data was as follows: (a) open-ended survey questions; (b) one-on-one interviews; and (c) focus group interviews. The qualitative data helped explain possible reasons for the quantitative results, such as (a) the LTTA program increased student involvement at school; and (b) specific cognitive links between particular art areas and academic subjects.
Criterion referenced response tasks from the Canadian Achievement Tests were used to measure student achievement in the subsequent ways: (a) manipulating mathematical figures and paying attention to details in concepts of money (grade 1); and (b) interpreting graphs and solving problems with patterns (grade 2).

The Canadian Achievement Tests (CAT*3) were the instruments used for measuring student achievement in grades 3-6 in the following areas: (a) abilities in reading comprehension, vocabulary, story sequencing, vocabulary, and grammar; (b) understanding of geometry, mathematical concepts, computations, and estimations; and (c) writing samples to a standardized prompt that were criterion-referenced and scored centrally (for grades 1-6).

The sample size in the study incorporated: (a) 6000 students; (b) the parents of the participating students; (c) teachers; and (d) administrators. The study began in July of 1999 with eight to eleven LTTA schools at each site. A random sample of 650 students per grade level was chosen with a staggered entry by grade level over a three-year period. The students and teachers in first and fourth grades were given LTTA programming the first year (1999-2000), second and fifth graders were included in the second year (2000-2001), and third and sixth grades joined the final year (1999-2000). The assessment and survey schedule followed the program structure, resulting in 4063 LTTA students being sampled from 55 LTTA schools.

The procedure for the LTTA study began with submitting the LTTA data into computer files for analysis with the SPSS software (Norusis, 1993). In order to guarantee accuracy and consistency in the data entry process, a double data entry for 10% of the data was completed, which estimates that 97% of the data was submitted accurately.
Group comparisons were then made between the LTTA students and those students in the two control groups.

A factor analysis was conducted for first through sixth graders in order to distinguish the students' viewpoints and experiences with the arts both at and outside of school. Student-focus interviews were performed to better comprehend the fundamental reasons for differences in student: (a) attitudes; (b) interests; and (c) achievement levels. Subsequently, the data from focus group field notes was coded by at least two researchers from the research team who were responsible for analyzing the data. Finally, the audiotapes were transcribed and analyzed by employing the ATLAS software, which was intended to match traditional methods of theory building based on a grounded approach to qualitative analysis (Glaser, 1978; Muhr, 1997)

The results of the LTTA study exhibited no baseline differences on the comparison measures with students in the three types of schools presented in the study in terms of: (a) student achievement; (b) socioeconomic status; (c) attitudes towards school; (d) participation in the arts; and (e) parental values concerning the arts. However, due to the shortage of baseline differences, the researchers were able to make justifiable comparisons between the various types of schools in the third year of the study.

At the end of three years, the following occurred with sixth graders from the LTTA programs: (a) scores were substantially higher on computation tests than the students in the control schools ($p < .05$); (b) girls from the sixth grade were more at ease about school than the other students ($p < .05$); and (c) the statistically significant effects that LTTA had on achievement were gradual, happening in the third year of the LTTA program. Nevertheless, it is important to note that computation scores by nature are
The LTTA program corresponded with approximately 1.2% of the variance, after accounting in prior mathematics experience. Most of the explained variance (24.3%) was based on previous exposure to math. Another 1.3% of the variance came from household income and mother’s education. There was no interaction effect between socio-economic factors and type of program. The explained variance in computation and estimation scores was $N=408$ (see Table 8).

Table 8.
Regressions Predicting Mathematics Scores for Earlier Mathematics Scores, Household Income, LTTA Program and Music Lessons out of School

<table>
<thead>
<tr>
<th>Step</th>
<th>Computation and Estimation:</th>
<th>$\hat{r}$</th>
<th>$\hat{r}$ change</th>
<th>$\beta$</th>
<th>$p$</th>
<th>$F$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Grade 4 math score</td>
<td>.243</td>
<td>.243</td>
<td>.493</td>
<td>.000</td>
<td>136.06*</td>
</tr>
<tr>
<td>Step 2</td>
<td>Grade 4 math score</td>
<td>.474</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Household income</td>
<td>.256</td>
<td>.013</td>
<td>.121</td>
<td>.008</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mother’s education</td>
<td>.037</td>
<td>.414</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>Grade 4 math score</td>
<td>.471</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Household income</td>
<td>.104</td>
<td>.022</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mother’s education</td>
<td>.028</td>
<td>.528</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LTTA program</td>
<td>.268</td>
<td>.012</td>
<td>.110</td>
<td>.010</td>
<td>38.42*</td>
</tr>
<tr>
<td>Step 4</td>
<td>Grade 4 math score</td>
<td>.466</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Household income</td>
<td>.101</td>
<td>.026</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mother’s education</td>
<td>.041</td>
<td>.364</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LTTA program</td>
<td>.112</td>
<td>.008</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Music lessons</td>
<td>.275</td>
<td>.007</td>
<td>.084</td>
<td>.047</td>
<td>31.74*</td>
</tr>
</tbody>
</table>

* $p < .001$

Source: Smithrim and Upitis (2005)
The results demonstrated how (a) students who performed high on one language measure tended to score well on both the other language and math measures; and (b) LTTA benefited students from all socioeconomic groups.

The students' attitudes, concerning their experiences with the arts in and outside of school, from all three types of schools were combined for factor analyses and standard measures for data reduction were then implemented. The extraction method for the different components was a principal component analysis with Varimax notations. Factor loadings for components at values 0.30 or more were reported, and all double loading factors were removed. Next, the factors were determined and correlated to different measures including: (a) gender; (b) household income; and (c) student achievement.

The results of the factor analyses pointed toward strong patterns, which strengthened over time, of specific attitudes towards the arts beginning in children as young as six years of age. Three factors surfaced from the results: (a) pleasure related to the core subject areas; (b) enjoyment of the arts; and (c) satisfaction with gym, computers, and working cooperatively with friends. In terms of students' attitudes related to the core subject areas, this factor did not correlate with gender. However, students' views towards academic subject areas did positively correlate (see Table 3) in the following areas: (a) language achievement \( (r = .46, p < .01) \); (b) language development \( (r = .17, p < .01) \); and (c) household income \( (r = -.14, p < .01) \).

The results revealed similar patterns in terms of out-of-school activities and are as follows: (a) girls were more prone to participate in the arts \( (r = .21, p < .01) \); (b) boys favored solitary or screen-related activities \( (r = .27, p < .01) \); and (c) out-of-school activities correlated weakly with all four achievement measures \( (r = -.10 \text{ through } .14) \).
The factors concerning the arts both in and outside of school, out of all the three sets of analyzed factors, were the most complicated and diverse from grade to grade. The results showed the following evidence: (a) students who benefited the most from the arts were not involved with the arts outside of school and (b) students who were active in the
arts outside of school conveyed no interest of more arts instruction at school (see Table 10).

<table>
<thead>
<tr>
<th>Component</th>
<th>Factor 1: Core</th>
<th>Factor 2: Solitary</th>
<th>Factor 3: Reading/Music</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out of school I take drama lessons</td>
<td>0.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Out of school I take visual arts lessons</td>
<td>0.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Out of school I take dance lessons</td>
<td>0.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Out of school I sing in a group</td>
<td>0.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Out of school I listen to music</td>
<td></td>
<td>0.53</td>
<td></td>
</tr>
<tr>
<td>Out of school I play video games</td>
<td></td>
<td>0.72</td>
<td></td>
</tr>
<tr>
<td>Out of school I watch TV</td>
<td></td>
<td>0.69</td>
<td></td>
</tr>
<tr>
<td>Out of school I play alone</td>
<td></td>
<td>0.47</td>
<td></td>
</tr>
<tr>
<td>Out of school I read for fun</td>
<td></td>
<td></td>
<td>0.57</td>
</tr>
<tr>
<td>Out of school I take part in clubs</td>
<td></td>
<td></td>
<td>0.52</td>
</tr>
<tr>
<td>Out of school I take music lessons</td>
<td></td>
<td></td>
<td>0.65</td>
</tr>
</tbody>
</table>

Reliability Co-efficients: .70 .47 .37

Source: Smithrim and Upitis (2005)

The analysis that Winner and Cooper (2000) conducted indicated significant signs of involvement in the arts being connected to engagement in learning at school. The surveys and interviews from the study support students, teachers, parents, and administrators reflecting the benefits of the arts and their impact on learning. There were even some cases that reflected the effects of the LTTA program as having a "transcendent" or moving effect on students' personal beliefs and practices. Both the
qualitative and quantitative results supported the notion that LTTA students were more engaged at school and therefore, performed better on computation and estimation tests.

The third year student achievement results were determined by conducting straightforward statistical analyses using descriptions from “cross-tabulations” and “Tests” in order to ascertain what some possible group differences might be from the third year. A regression analysis was conducted to verify the effect sizes in the two cases where substantial group differences were found in the means analyses. Once the regression analysis was finished, the results revealed that the LTTA students performed higher exclusively on the computation and estimation tests.

Recommendations from the LTTA study suggest: (a) conducting more longitudinal research be conducted on the long-term effects of art instruction on learning; (b) investigating whether or not the modest gains in mathematics achievement will continue over time; (c) determining whether statistical differences in language measures may emerge over time; (d) exploring the reasons why girls appear to favor involvement in the arts more than boys; (e) looking further into how engagement in the arts explains an increase in student achievement to test the engagement hypothesis; and (f) replicating the present study.
Successful Tutoring Programs

Concepts encompass numerous facts and lower-level generalizations. Key concepts are chosen from several disciplines and have evolved into an organized generalization that explains aspects of human behavior in various cultures, times, and places related to that concept (Banks, 2003). There are three common threads prevalent across successful tutoring programs which include: (a) many opportunities to read authentic materials; (b) many applications of reading integrated with authentic writing experiences; and (c) highly motivating reading and writing activities related to students' interests and abilities by caring tutors.

The goal of reading is comprehension. The development of comprehension skills comes from both practice and the use of specific reading strategies. Successful comprehension comes most easily when the reader has: (a) prior knowledge of the subject; (b) is familiar with the vocabulary; (c) has a knowledge of text structure used; and (d) has a repertoire of strategies to use with different types and genres of text (Leils, 2003).

According to the Nation's 2003 Report Card, only 31% of fourth graders performed at or above the proficient reading level (United States Department of Education, NCES, 2004). Fourth graders in the United States averaged lower in reading in 2001 than fourth graders in England, the Netherlands, and Sweden (International Association for the Evaluation of Educational Achievement, PIRLS, 2003). The most frequent cause for children being referred to special education programs has been because of reading problems (Learning First Alliance [LFA], 1998).
Parental involvement in reading can have a positive effect on children's results (Fawcett, Rasinski, and Linek, 1997; Senechal and LeFevre, 2002; Shaver and Walls, 1998; Weinberger, 1996). A five-year longitudinal study by Senechal and LeFevre (2002) discovered that parent involvement in teaching reading was linked to budding literacy. Another longitudinal study of home reading practices (Weinberger, 1996) established that children whose parents provided less time and support to reading were more likely to have children with reading difficulties at school.

Students whose parents increased their school involvement made noteworthy learning gains after three years, while the children who received help from the reading specialist demonstrated no significant gains compared to the control group. Meta-analytic research illustrated the significance of parents reading with preschoolers. Sustained reading achievement and language growth were constant with the results in the study (Bus, van Ijzendoorn and Pellegrini, 1995).

Toomey (1993) advocated that previous studies established a case for parents of struggling readers being less apt to use effective methods of reading instruction than the parents of proficient readers. Parents would profit from specific training concerning valuable strategies while reading with children.

Leach and Siddall (1990) performed a study comparing frequently used styles of parent-implemented reading interventions. Four types of interventions were studied: (a) listening to the child read; (b) paired readings; (c) pause, prompt, and praise; and (d) direct instruction. Each group received an hour and a half training session in which procedures were described and modeled. Parents applied the intervention for 10 to 15 minutes a day on school days for 10 weeks.
The analyses demonstrated considerable differences between in the intervention groups based on posttest scores from the Neale Analysis of Reading Ability measure. The pause, prompt, and praise and direct instruction groups increased considerably in reading performance. The researchers determined that the difference in effectiveness of the conditions could be credited to the explicit instructions and corrective steps applied in the interventions. Structured and precise actions were essential aspects of effective parent-implemented reading interventions (Resetar, Noell, and Pellegrin, 2006).

The following researchers (a) Duvall, Delquadri, Elliott, and Hall (1992); (b) Hook and DuPaul (1999); (c) Leach and Siddall (1990); (d) Love and Biervliet (1984); and (e) Thurston and Dasta (1990) replicated the efficacy of the research on the parental tutoring program called Progressive Reading Practice (PRP) (Gatti, 2004). The authors recommended that parent tutoring procedures use: (a) direct instruction; (b) reinforcement; (c) modeling; (d) a highly structured procedural routine; (e) correction methods; (f) modeling; (g) error correction; (h) reinforcement; (i) oral passage preview; (j) repeated readings; (k) goal setting; and (l) performance feedback (Noell, 1998). However, a weakness in this study was that the program was not tested when implemented by parents.

The study employed a parent tutoring intervention based on the PRP procedures. The research syntheses made contributions to the reading intervention based on the knowledge of the National Institute of Child Health and Human Development (2000) and Learning First Alliance (1998, 2000). The components were compatible with the requirements for reading instruction stated in the "No Child Left Behind" policy adopted by the U.S. government in: (a) phonics; (b) reading fluency; and (c) reading
comprehension (United States Department of Education, NCLB, 2002). The study was also an accumulation of prior research conducted by the curriculum-based measurement (CBM) of participants' oral reading fluency into the intervention, an assessment used to measure the growth in reading skills (Shinn, Good, Knutson, Tilly, and Collins, 1992).

Resetar, Noell, and Pellegrin (2006) sought out to explore the efficacy of a parent training and reading tutoring method in a study. Parents of five first-grade children who were reading below grade level contributed were all enrolled in general education first-grade classrooms in southeastern Louisiana. The participants in the study (a) attended the same elementary school; (b) were from families where both parents had high school diplomas; (c) were Caucasian between the age 6 or 7; (d) had not been retained; and (e) were not receiving any special services or remedial reading instruction. Two of the participating mothers had completed some college or had some form of technical training. One set of parents had bachelor's degrees.

Parents were taught how to employ a tutoring method that included: (a) modeling; (b) practice; (c) phonics; (d) fluency building; (e) accuracy building; (f) comprehension; and (g) reinforcement components. Assessments of tape recordings and products revealed high levels of treatment integrity. A multiple baseline across participants was used to test the results. Four out of five children who participated in the study increased the number of words read correctly per minute on tutored reading passages.

The five participants were administered three Curriculum-Based Measures (CBM) of Oral Reading Fluency (ORF), incorporating a standardized procedure while administering the CBM. The researchers determined the number of words read correctly per minute (WCPM) by counting the total number of words read and subtracting the
number of errors. The mean ORF score was achieved by using the scores of the three probes given and was taken as the measure of reading performance. Oral reading fluency probes were used to test (a) WCPM; (b) baseline; and (c) tutoring sessions (Resetar, Noell, and Pellegrin, 2006).

The dependent measure or reading performance was WCPM during a CBM oral reading fluency scored (Shinn, 1989). The researchers (Resetar, Noell, and Pellegrin, 2006) gathered baseline measurements at the students' school. Parents collected an oral reading fluency probe during intervention at the start and end of each session of each session. Six to 11 additional data points were collected during the intervention to determine the generalization.

Twenty-eight percent of assessments were independently scored, and the interscorer agreement was measured by dividing all agreements by the summation of agreements and disagreements multiplied by 100. The results of the tests were as follows: (a) the total interscorer agreement was 98.98%; (b) the interobserver agreement was 99.25%; (c) the baseline assessments were 25.25%; and (d) the reliability was 98.64%.

Pre- and post-data was collected with the Intervention Rating Profile (IRP-15) designed by Witt and Martens (1983) to determine the acceptability of the intervention (Resetar, Noell, and Pellegrin, 2006).

The procedure of the study was to: (a) incorporate a multiple baseline with tri-weekly measures of WCPM; (b) to record the children's WCPM progress for 3 weeks; and (c) to measure the treatment integrity of the parent tutoring sessions by completing the tutoring progress-monitoring log daily. A random sample of 25% of all the tutoring sessions was examined for correct procedure implementation.
The results show how the (a) improvement from parent-child collaboration correlated with success at school in a short treatment period; and (b) gains in reading fluency. The mean increase in reading fluency for tutored passages was approximately 22 WCPM. All of the participants displayed (a) gains in tutored passages over untutored passages; and (b) instant gains in reading fluency. The parents implemented the tutoring procedure with a mean integrity at or above 82% and treatment was rated as being satisfactorily implemented by all five parents. The tapes also pointed out a strong level of implementation with all of the steps completed (Resetar, Noell, and Pellegrin, 2006).

The limitations of the study are as follows: (a) the moderately short period of tutoring time; (b) the small sample size; and (c) one cannot categorize which precise component resulted in an increase in WCPM. Recommendations for future research included (a) student engagement; and (b) parental struggles with time and schedules; (c) implementing a more extensive treatment trial; (d) considering a more controlled systematic progression of passages with familiar levels of overlapping vocabulary (National Institute of Child Health and Human Development, 2000); (e) inspecting the comparative benefit of underscoring phonics instead of solely fluency; (f) reading intervention components separately and in diverse combinations to calculate the singular and additive effects; (g) evaluating the long-term effects of the intervention; (h) recording long-term data associated with the use and effects of the intervention; and (i) increasing the sample size (Resetar, Noell, and Pellegrin, 2006).

**Standardized Tests**

The reading scores of low performing reading students on high-stakes tests reflected more of an increase of test anxiety in 25% of all elementary and secondary-level
students in the United States than actual reading ability (Pintrich and Schunk, 1996). The traditional route to preparing students for standardized tests cannot produce the desired improvement in schools because the tests have not dealt with matters of teacher effectiveness or student motivation (Stiggins, 1999). High-stakes testing procedures were used as a tool to measure student knowledge and the effectiveness of instruction. Standardized tests, when used appropriately, helped teachers identify student strengths and weaknesses (McMillan, 2000).

A review of literature on alternative models of preparing students for standardized tests revealed an increasing need for using the arts as a foundation for learning in reading (Heathcote, 2000). These approaches offered innovations that trigger students' prior knowledge of subject matter by targeting their interests and reaching their learning modalities. A defining characteristic of these programs was their focus on using the arts as a means of motivating students and providing meaningful learning experiences. Standardized tests were intended to measure learning outcomes and skills that were common to the curriculum in schools and school districts (Chatterji, 2003).

**Texas Assessment of Basic Skills Test**

Hoffman, Assaf, and Paris (2001) conducted a survey to focus on the effects on teachers and students from Texas taking the Texas Assessment of Basic Skills Test. The primary goal of the survey was to show how instruction was affected by testing from the point-of-view of the teachers who experienced the Texas Assessment of Basic Skills Test firsthand. The hypothesis of the study was that pressures of high-stakes testing compromised excellence in teaching. The survey was comprised of 113 items: (a) 12 items of demographic information; (b) 20 items covered general attitudes from the
respondent; (c) 22 items of perceived attitudes of others; (d) 27 items concerned test preparation and administrative practices; (e) 16 items of how test scores were used; (f) 11 items related to the effects of the test on students; and (g) five items of overall feelings about testing.

The data findings from the 200 returned surveys were entered into a data file for item-level analyses. The Composite scores were reported using means and standard deviations. The individual scores were categorized and reported by responses, and the qualitative analysis in the final selection of comments from the survey centered on common themes. Eighty percent of respondents gave additional comments above the five items included in the survey.

A composite score was designed from the following four items based on teachers' general attitude towards the Texas Assessment of Basic Skills Test:

1. Better TAAS tests would make teachers more effective at their job ($M = 1.8; SD = .68$);

2. TAAS motivated students to learn ($M = 1.6; SD = .71$);

3. TAAS scores were an appropriate measure of teacher effectiveness ($M = 1.6; SD = .68$); and

4. TAAS test scores provided adequate comparisons concerning the quality of school districts ($M = 1.9; SD = .76$)

The other composite variable included items that related to the validity of the TAAS as a measure of student learning. The four variables included:

(1) TAAS tests accurately measured for minority students ($M = 1.6; SD = .73$);
(2) TAAS tests scores accurately measured the achievement for limited English-speaking students. \( (M=1.5; SD=.64) \); 

(3) Students' TAAS tests scores accurately measured what they had learned during the past school year. \( (M=1.8; SD=.75) \); and 

(4) Students' TAAS tests scores reflected the cumulative knowledge accrued throughout their history at school. \( (M=2.1; SD=.84) \) 

The participants were all members of the Texas State Reading Association and consisted of: (a) classroom teachers; (b) reading specialists; (c) curriculum supervisors; and (d) educators in leadership positions. A random selection process was used to obtain 500 out of 4,000 names from the membership mailing list. Out of 750 surveys that were sent out, 200 were successfully returned. The overall return rate resulted in 27% from 5% of the total membership.

The sample population represented an experienced select group of reading teachers from Texas who worked primarily with students living in poverty. Sixty-six percent of the respondents to the survey were over the age of 30 and 33% were between the ages of 40 and 60. Sixty-three percent had worked for more than 10 years in the classroom, while 29% of them had more than 20 years. Seventy-eight percent of the participants were employed in elementary schools, with 81% of the teachers teaching predominantly minority students from in low-income communities. Only 16% of the participants worked in schools where the passing rate was over 90% on the Texas Assessment of Basic Skills Test. Fifty-one percent of those who responded were working where passing rates for students were between 70 and 90%, while 32% were working where the overall passing rate was less than 70%.
were the lowest performing students (Hoffman, 2001). Clarifying the test format and content provided a structure for students that reduced test anxiety and led to higher achievement among the lowest performing students (Eggen and Kauchak, 1997). The impact that the testing had on students was found in the data displayed in Table 12.

Table 12.  
Effects of TAAS Testing on Students

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Never %</th>
<th>Sometimes %</th>
<th>Often %</th>
<th>Always %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truancy</td>
<td>40</td>
<td>52</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Upset stomach</td>
<td>7</td>
<td>53</td>
<td>32</td>
<td>8</td>
</tr>
<tr>
<td>Vomiting</td>
<td>18</td>
<td>53</td>
<td>21</td>
<td>8</td>
</tr>
<tr>
<td>Crying</td>
<td>22</td>
<td>60</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>Irritability</td>
<td>12</td>
<td>50</td>
<td>30</td>
<td>8</td>
</tr>
<tr>
<td>Increased aggression</td>
<td>22</td>
<td>43</td>
<td>28</td>
<td>7</td>
</tr>
<tr>
<td>Vomiting or soiling themselves</td>
<td>74</td>
<td>23</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Headaches</td>
<td>8</td>
<td>45</td>
<td>33</td>
<td>14</td>
</tr>
<tr>
<td>Refusing to take test</td>
<td>53</td>
<td>37</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Increased misconduct</td>
<td>29</td>
<td>42</td>
<td>23</td>
<td>6</td>
</tr>
<tr>
<td>Freezing up</td>
<td>12</td>
<td>54</td>
<td>25</td>
<td>9</td>
</tr>
</tbody>
</table>


Effects of High-Stakes Testing

Teachers and students were the most directly impacted by high-stakes testing, yet these points of view have been largely ignored in policy making. Flores & Clark (2003) employed a qualitative design with the purpose of addressing the following contentious issues behind testing: (a) whether high-stakes tests were a valid indication of measuring students’ learning, ability, and potential; and (b) whether test results should be utilized for accountability purposes.
The data gathered for research included: (a) faculty directed e-mail threaded journals; (b) pre-service teachers' observation journal reflections; and (c) faculty direct observation field journals. The data collected from teachers and students was triangulated to categorize common themes, and reliability was determined by incorporating peer-review and member checking procedures. Flores and Clark (2003) independently created a matrix to distinguish common patterns across the data. Only themes revealed by the majority of the respondents in the analysis were included as part of the peer-review.

The sample population included: (a) 18 undergraduate pre-service teachers ($n = 18$); (b) 10 graduate in-service teachers ($n = 10$); and (c) 30 participating public school students ($n = 30$). Both the pre-service and in-service teachers were participating in either an undergraduate or graduate program at a Texas institution. Nine of the 18 undergraduate pre-service teachers, who volunteered to participate in the study, were elementary education generalists enrolled in a methods class and were completing fieldwork at middle and low-income schools. The majority of the teachers were monolingual first-generation college-aged students. The other nine pre-service bilingual teachers were bilingual education majors taking an undergraduate language assessment course and also actively participating in student teaching at low-income urban schools.

The in-service teachers came from the following specialization backgrounds: (a) early childhood; (b) elementary; and (c) secondary teachers. The in-service teachers who were enrolled in a graduate level assessment course ($n = 5$) were bilingual and had accrued five or more years of experience in teaching, while the other teachers were in the advanced methods course ($n = 5$). All of the remaining graduate students were first year teachers, with two teachers being monolingual and the other three bilingual.
The public school students who participated in the study were all enrolled in the pre-service teachers’ classrooms. The students came from diverse geographic backgrounds including: (a) urban to suburban; (b) lower to upper-middle backgrounds; and (c) elementary, middle, and high school levels.

The data for the study came from both the in-service and pre-service teachers’ threaded e-mail discussions and observational journals. Six themes emerged that were identified from the analysis of the data: (a) teachers perceived assessment as being distinct from high-stakes testing; (b) teachers speculated that an overemphasis on testing results created an unbalanced curriculum that resulted in unsuitable instructional decisions; (c) teachers proposed that an unwarranted amount of pressure was placed on certain grade levels; (d) teachers doubted whether or not they wanted to pursue or continue in the teaching field; (e) teachers strongly suggested that testing results not be used to make high-stakes decisions; and (f) teachers experienced how the pressures from testing negatively affected students and how testing caused physical, psychological and emotional symptoms in students.

The patterns that materialized supported the notion that the overemphasis of high-stakes testing had been both: (a) invasive of teachers’ curricular and instructional decision-making; and (b) detrimental to the best interests of students. The results of the study reflected teachers’ concerns regarding: (a) whether or not tests were valid instruments for particular student populations; (b) if tests truly represented the diverse abilities of students; (c) whether assumptions were made about certain student populations based on a single test performance; (d) if tests accurately measured a
student's ability or not; and (e) how the linguistic, cultural, and economic differences among students were being addressed.

Flores and Clark (2003) concluded from the results of the study that narrowing the curriculum to focus exclusively on what was tested would result in more teachers fleeing from the profession. The results also indicated how teachers were not given the opportunity to make curricular, instructional, and assessment decisions based on professional knowledge and expertise. Finally, the results reflected how the professional role of teachers was reduced to that of a technical one, by limiting teachers' decision-making powers and innovativeness.

Recommendations for this study included a follow-up study that scrutinized the effects of the existing testing mandates to see if younger students' perceptions would still be more positive than older students, since younger students may now be retained for not passing the high-stakes tests.

**Demand for Accountability**

Most states installed accountability systems by 2000 under a central campaign theme of George W. Bush with the goal of eventually expanding the campaign to all states under the No Child Left Behind Act of 2001 (NCLB). The landmark NCLB marked a developing policy view that (a) standards; (b) testing; and (c) accountability were the effective routes towards improved student performance (Hanushek, 2004).

Parents and legislators expected high student achievement and accountability for the return of federal dollars spent in public education. The global economy and age of technological advancement demanded higher expectations under standards-based
instruction. A RAND (2000) analysis found positive results in academic gains in students in North Carolina and Texas.

Students' reading comprehension skills were demonstrated by responding to questions about various types of reading passages on the 2007 National Assessment of Educational Progress (NAEP) reading assessment. Reading abilities were assessed in the contexts of (a) the literary experience; (b) gaining information; and (c) performing a task.

**Figure 36. Gains in Reading for Fourth and Eighth Graders**

- 4 states and jurisdictions (District of Columbia, Florida, Hawaii, and Maryland) improved at both grades,
- 13 states (Alabama, Alaska, Georgia, Indiana, Iowa, Kansas, Nevada, New Jersey, New Mexico, Massachusetts, Mississippi, Pennsylvania, and Wyoming) and Department of Defense schools improved at grade 4 only,
- 2 states (Texas and Vermont) improved at grade 8 only,
- 2 states declined at grade 8 (North Dakota and Rhode Island), and
- 30 states showed no significant change at either grade.

Source: National Assessment of Educational Progress (2007)
A nationally representative sample of more than 350,000 students from fourth and eighth grades participated in the 2007 reading assessment. After comparing the results from previous years to 2007, the results show the progress fourth and eighth graders made both in the nation and in individual states. Fourth-graders scored higher in 2007 than in all the previous assessment years. The average reading score was up two points since 2005 and four points compared to the first assessment 15 years ago.

Higher percentages of students performed at or above the Basic and Proficient achievement levels in 2007 than in previous years. The average reading score for eighth-graders was up one point since 2005 and three points since 1992. However, the trend of increasing scores was not consistent over all of the assessment years. In comparison to both 1992 and 2005, the percentage of students performing at or above the Basic level increased, but there was no noteworthy change in the percentage of students at or above the Proficient level (National Assessment of Educational Progress, 2007).

White, Black, and Hispanic students all scored higher in 2007 than in the first assessment 15 years ago in both fourth and eighth grades. However, the improvements for minority students did not result in the narrowing of the achievement gaps with White students. Only the White – Black gap in fourth grade was smaller in comparison to the gaps in 2005 and 1992 (see Figure 37).
**Figure 37. Learning Gains of White, Black, and Hispanic students**

<table>
<thead>
<tr>
<th>Student groups</th>
<th>Grade 4</th>
<th>Grade 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>White</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>Black</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>Hispanic</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>↑</td>
<td>←←</td>
</tr>
<tr>
<td>American Indian/Alaska Native</td>
<td>←←</td>
<td>←←</td>
</tr>
<tr>
<td>Male – Female gap</td>
<td>←←</td>
<td>←←</td>
</tr>
<tr>
<td>White – Black gap</td>
<td>↓</td>
<td>↓</td>
</tr>
<tr>
<td>White – Hispanic gap</td>
<td>←←</td>
<td>←←</td>
</tr>
</tbody>
</table>

↑ Indicates the score was higher or the gap increased in 2007.
↓ Indicates the score was lower or the gap decreased in 2007.
←← Indicates there was no significant change in the score or the gap in 2007.
†† Reporting standards not met. Sample size was insufficient to permit a reliable estimate.

**Source:** National Assessment of Educational Progress (2007)

The National Assessment of Educational Progress (NAEP) has been regularly testing students across the country in a range of subject areas for the past 30 years. The tests were administered to a random sample of students from various grade levels across the nation (Hanushek, 2004). The result of student performance over the past three
decades remained flat overall. Although reading and math scores were slightly higher at the end of three decades, science and writing scores have clearly declined.

School funding had increased considerably over the same period, while the spending per student more than tripled between 1960 and 2000. The increased resources have not, however, improved student performance. The purpose of school reformers and policy makers increasing the budget was to: (a) reduce pupil-teacher ratios; (b) provide resources for specific school programs; and (c) develop a more qualified teaching force (Hanushek, 2004).

Previous efforts in school reform were based on implementing certain measures with the hope that the specific changes would lead to improved student performance. However, the decisions often made in the past were not based on empirical research that could ensure higher probabilities of success.

Alternative means of affecting change in schools has arisen from the slow progress the country has made in student achievement. A common theme has been the regulation of outcomes rather than the more traditional regulation of process and inputs. The new "regulatory frameworks:" (a) emphasized objective outcome; (b) allowed schools to decide how to meet demands for achievement; (c) included the public monitoring and reporting of student outcomes; and (d) enforced negative consequences for the stakeholders of schools who could not meet the demands (Hanushek, 2004).

*Standards-Based Instruction*

The publication of *A Nation at Risk* (National Commission on Excellence in Education, 1983) ignited mandatory testing as Americans discovered that students were performing substantially below students from other countries in both reading and math.
On an international level, the United States has performed at or below average since the 1960’s.

The push for school accountability and standards-based assessments emerged from the federal plan Goal 2000 that was designed to determine educational standards for every state to improve education in all schools. The standards-based movement was designed to: (a) “raise the bar” on student achievement; (b) improve instruction; (c) increase test scores; and (d) strengthen school accountability. The result is that standards-based instruction has produced drastic changes in testing frequency and design since schools and neighborhoods are ranked by test results. Before the standards-based instruction movement, students were tested once every three to four years between fourth and twelfth grade (Klein & Zevengergen, 2006).

Since the 1980’s, school reform has been driven by the measurable academic standards all students should know in order to guide other components of the public school system. Students in a standards-based system are measured against a concrete standard, rather than measuring how students performed compared to others. Professional development, the school curriculum, and the assessments are all in alignment with the standards from each state.

Effects of Standardized Testing on Schools

The effects of standardized testing on schools, administrators, teachers, and students raised the concern of two researchers who came from educational and psychological backgrounds. Klein and Zevenbergen (2006) administrated a survey to 20 elementary, middle, and high school teachers on how standardized testing affected teachers’ focus of instruction in a semi-rural community in Western New York. The
evidence from the data collected supported teachers: (a) preparing for tests year-round; (b) allowing test-related instruction to dominate the curriculum; (c) developing more focused teaching experiences for students; and (d) feeling the necessity behind revealing the challenges of testing.

Klein and Zevenbergen sent 200 questionnaires to five schools, three of which were elementary, two were middle, and one was high school, in the western New York area. Twenty teachers responded with detailed written responses. The researchers used qualitative analyses to analyze the responses and to categorize the issues regarding state testing in schools: (a) the impact testing has had on teachers and students; (b) the teachers managed instruction to prepare for the tests; and (c) the manners in which teachers helped students while testing. The constant comparative method was used to analyze the data (Glaser & Strauss, 1967).

The method for analyzing the qualitative data combined inductive category coding with simultaneous comparison of all units being obtained. The purpose of the questionnaires was to develop propositions that would create statements of facts through rigorous and systematic analysis of the data. Klein and Zevenbergen (2006) began the analysis by identifying small units of meaning from the responses and cutting apart each response into separate data units. Categories were then formulated based on common features in the responses. Each new unit of meaning was selected for categorization and compared to other units of meaning. Finally, larger categories were formed based on common threads of meaning found across smaller categories (Lincoln & Guba, 1985).

Klein and Zevenbergen (2006) carried out a surface examination of the sample population as to: (a) gender; (b) race; (c) grade taught; and (d) years of teaching.
experience. The results were that of the 20 participants: (a) 30% were male and 70% were female; (b) 43% taught elementary school, 29% taught middle school, and 19% taught high school; (c) the mean length of teaching experience was 15.0 years ($SD = 12.24$ years); and (d) 78% of the teachers were Caucasian. The results supported that standardized tests have had a negative affect on teaching in 77% of the responses, with 23% reporting a positive effect.

The conclusion from the research confirmed that the pressure on teachers from administrators to earn positive results from testing and to reach the standards caused damaging tension in schools. The similarity in the responses led the researchers to conclude that teachers were being forced to mirror the school administrators’ mandates on testing rather than implement the best pedagogical practices teachers deemed as being necessary based on experience.

The recommendations from the research were that: (a) school administrators offer more in-service workshops to boost teachers’ morale; (b) school districts encourage teachers to stay in the field; (c) schools provide forums on converting test-taking drill activities into strategy-building ones; (d) teachers could model think-aloud strategies that help students problem solve and pace themselves during tests; and (e) parents could be invite to share and participate as a way of supporting an effective approach at home.

**Teacher Efficacy**

Barfield and Burlingame (1974) conducted the first study on teacher efficacy using the Political Efficacy Scale (Campbell, Gurin, & Miller, 1954) to categorize the responses of teachers into (a) low; (b) average; or (c) high levels of teacher efficacy. The results from teachers’ responses were based on the patterns of agreement or disagreement
to the researchers’ questions. Barfield and Burlingame described teacher efficacy as being grounded in psychology and being both a personality trait and educators’ responses to particular situations.

The aspect of motivational orientation suggested that intrinsic motivation was encouraged when teachers placed emphasis on administering information, rather than attempting to control students. Teachers, who approached classroom problems with the belief that problems could be solved by encouraging student autonomy and responsibility, yielded (a) more intrinsic motivation; and (b) student outcomes that demonstrated students’ ability to solve problems more effectively (Woolfolk & Hoy, 1990).

A teacher’s sense of efficacy is the belief that educators have the capability of having a positive effect on student learning (Ashton, 1985). The variables associated with teacher efficacy are: (a) student achievement; (b) student motivation; (c) teachers’ adoption of innovation; (d) superintendents’ ratings of teacher competence; and (e) classroom management strategies (Woolfolk & Hoy, 1990).

People are more inclined to exhibit particular behaviors when they perceive themselves as being capable enough of executing those behaviors successfully. A high level of self-efficacy is defined as a form of self-confidence in one’s ability to learn new information (Ormond, 1999). Bandura (1977) defined self-efficacy as the people’s judgments and capabilities to organize and execute courses of action required to attain designated types of performances.

The first study ever conducted on teacher efficacy, according to the Educational Resource Information Center (ERIC), was by Barfield and Burlingame (1974). The researchers used the Political Efficacy Scale (Campbell, Gurin, & Miller, 1954) to categorize the
responses of teachers into (a) low; (b) average; or (c) high levels of teacher efficacy, based on the patterns of agreement or disagreement to the researchers’ questions. The results of the study helped determine that teachers with a low sense of efficacy were less humanistic than average (Woolfolk & Hoy, 1990).

Rotter (1954) developed the Social Learning Theory at a time when learning approaches were dominated by drive theory, which stated that people were motivated by physiologically-based impulses that encouraged the individual to satisfy them. The Social Learning Theory was a combination of behaviorism and the study of personality, excluding physiological instinct as a determining factor in motivation. The motivating factor in Rotter’s psychological theory was the empirical law of effect, which suggested that people were motivated to search for positive stimulation or reinforcement and inclined to avoid unpleasant stimulations (Tschannen-Moran & Hoy, 1998).

The premise of the Social Learning Theory (Rotter, 1954) was that personality is derived from an individual’s interaction with the environment. Behavior is the result of (a) the individual; and (b) the environment (Tschannen-Moran & Hoy, 1998). Personality and behavior are therefore changeable. If people change the way in which they think or change the environment in which they are in, so will the behavior change (Tschannen-Moran & Hoy, 1998). There were four components to the Social Theory Learning model (Rotter, 1954) that predicted behavior: (a) potential; (b) expectancy; (c) reinforcement value; and (d) the psychological situation (Tschannen-Moran & Hoy, 1998).

First, the behavior potential was the probability that a person would engage in a particular behavior based on a certain situation. For each possible behavior, there was a
behavior potential that a person would be willing to exhibit and would seek to achieve the highest potential from that behavior (Tschannen-Moran & Hoy, 1998).

Next, the subjective probability that a certain behavior would lead to a particular outcome was called *expectancy*. Expectancies were (a) based on past experiences; and (b) depended on the amount of times a behavior had led to reinforcement in the past. The desired outcome of one's behavior was more likely to occur when the *expectancy* was stronger. A person who demonstrated a high sense of expectancy revealed more confidence that the behavior would cause that outcome. Individuals with low expectancies had little confidence that their behaviors would result in reinforcement (Tschannen-Moran & Hoy, 1998).

Thirdly, the *reinforcement values* were the desirability of the outcomes resulting from the behaviors. People were attracted to particular outcomes that would reap a high reinforcement value, while undesirable events that people preferred to avoid had a low reinforcement value (Tschannen-Moran & Hoy, 1998).

Finally, the *predictive formula* for behavior was an accumulation of (a) behavior potential; (b) expectancy; and (c) the reinforcement value. The formula determined the likelihood of an individual exhibiting a certain behavior as the function of the probability that this particular behavior would result in a certain desirable outcome. If both expectancy and reinforcement value were high, the behavior potential would also be high. However, if either expectancy or reinforcement were low, the behavior potential would also be low (Tschannen-Moran & Hoy, 1998).

In contrast, the Cognitive Social Learning theory (Bandura, 1982) proposed that motivation was affected by: (a) outcome expectations (judgments about the consequences
of particular actions; and (b) efficacy outcomes (the belief that one is capable of reaching a certain level of performance in a given situation). People learned by observing others' (a) behavior; (b) attitudes; and (c) outcomes from those particular behaviors. According to Bandura (1982), the effects of modeling on behavior are that modeling would (a) teach new behaviors; (b) influence the frequency of previously learned behaviors; and (c) increase the frequency of similar behaviors.

The four general principles of the Cognitive Social Learning theory (Bandura, 1982) were as follows: (a) people learned from both observing others' behavior and from the outcomes of those behaviors; (b) learning could occur without a behavioral change in performance; (c) cognition of the expectations of future reinforcements and punishments could influence learning; and (d) the theory served as a transition between behaviorist and cognitive learning theories.

There were four necessary conditions in order for effective modeling to take place: (a) attention (the sensory capacities, arousal level, and past reinforcements); (b) retention (remembering symbolic coding, mental images, and both symbolic and motor rehearsal of those images); (c) reproduction (including self-observation of successfully reproducing the image); and (d) motivation (a reason for imitation, which included the environment and imagined incentives (Bandura, 1982).

The environment reinforced modeling in the following ways: (a) the observer was reinforced by the model; (b) the observer was reinforced by a third person; (c) the imitated behavior led to reinforcing consequences; and (d) there was an explicit reinforcement that took place when the model was reinforced for a response, which resulted in the observer demonstrating an increase in that same response (Bandura, 1982).
In order to determine teacher efficacy, Brogdon (1973) designed an instrument to be used in conjunction with the Political Efficacy Scale as a model. This research revealed that teachers' efficacy scores were directly connected to (a) satisfaction with their careers; and (b) the ratings of teachers' competence by supervisors (Woolfolk & Hoy, 1990).

Barfield and Burlingame (1974) described teacher efficacy as being grounded in psychology and being both a personality trait and educators' responses to particular situations. The development of a sense of teacher efficacy for new teachers depended on (a) establishing order in the classroom; (b) maintaining discipline; and (c) motivating students (Veenman, 1984).

The research on teacher efficacy performed by (Ashton & Webb, 1986) and Barfield and Burlingame (1974) was directly connected to (a) the teachers' attitude toward control; and (b) students' behavior in the classroom (Woolfolk & Hoy, 1990). There were three aspects of control examined in the research of Woolfolk and Hoy (1990): (a) pupil control ideology; (b) motivational orientation; and (c) bureaucratic orientation.

According to Ashton's (1984) findings, teacher efficacy was dependent on eight dimensions that helped define teacher effectiveness based on the teacher's perspective towards: (a) sense of personal accomplishment; (b) positive expectations for both student behavior and achievement; (c) feeling of responsibility towards student learning; (d) strategies for achieving objectives; (e) positive outlook towards self, students and teaching; (f) sense of control; (g) common teacher and student goals; and (h) democratic decision making.
Pupil control ranged from custodial to humanistic orientations in the classroom. The custodial model was derived from a traditional school setting with rigid and controlled settings concerned about maintaining order. The humanistic model, however, permitted students to learn through cooperative interactions and experiences. The stress in the humanistic approach rested on the importance of the individuality of each student and the creation of a climate that could meet a wide range of student needs.

Consequently, the more teachers believed in the ability of schools overcoming negative home factors, the more humanistic would be their orientation toward pupil control. Humanistic teachers demonstrated positive attitudes concerning being controlled under a bureaucracy, yet exhibited negative feelings toward controlling their students (Woolfolk & Hoy, 1990).

The aspect of motivational orientation suggested that intrinsic motivation was encouraged when teachers placed emphasis on administering information, rather than attempting to control students. Teachers, who approached classroom problems with the belief that problems could be solved by encouraging student autonomy and responsibility, yielded (a) more intrinsic motivation; and (b) student outcomes that demonstrated students' ability to solve problems more effectively (Woolfolk & Hoy, 1990).

Bureaucratic orientation referred to a person's commitment to a given set of (a) attitudes; (b) values; (c) and behaviors that were required by bureaucracies. Employees in bureaucratic organizations were expected to: (a) follow the commands of superiors in positions of authority; (b) follow the official rules; (c) pass judgments in an impersonal manner; and (d) show loyalty to both the administration and organization.
Educators who possessed a more bureaucratic orientation to school believed that schools could do little to (a) counteract the negative effects of students’ family backgrounds; and (b) change the inherent ability of students (Woolfolk & Hoy, 1990).

The result for bureaucratic educators was that the only control teachers truly had was to (a) control the students; and (b) accept the rules and regulations. Teachers with low efficacy tended to (a) use punitive management strategies to maintain control; and (b) be more bureaucratic. However, teachers exhibiting high efficacy were less bureaucratic and sought to (a) facilitate student autonomy; (b) instill trust; and (c) foster student responsibility (Woolfolk & Hoy, 1990).

According to Bandura (1982), human behavior was learned from the continuous reciprocal interaction between (a) cognitive; (b) behavioral; and (c) environmental influences. Bandura added that the sort of outcomes people expected depended greatly on their opinion as to how they might perform in that particular situation (Woolfolk & Hoy, 1990).

A teacher’s sense of efficacy is the belief that educators have the capability of having a positive effect on student learning (Ashton, 1985). The variables associated with teacher efficacy are: (a) student achievement; (b) student motivation; (c) teachers’ adoption of innovation; (d) superintendents’ ratings of teacher competence; and (e) classroom management strategies (Woolfolk & Hoy, 1990).

People are more inclined to exhibit particular behaviors when they perceive themselves as being capable enough of executing those behaviors successfully. A high level of self-efficacy is defined as a form of self-confidence in one’s ability to learn new information (Ormond, 1999). Bandura (1977) defined self-efficacy as the people’s
judgments and capabilities to organize and execute courses of action required to attain designated types of performances.

**Standard Performance Continuum**

The researchers (Doherty, Hilberg, Epaloose, and Tharp, 2002) created the Standards Performance Continuum (SPC) to serve as a quantitative instrument for assessing teacher performance of the Standards for Effective Pedagogy (SPC). The SPC instrument was used to research the relationship between teachers’ use of standards and instructional effectiveness in order to: (a) enhance professional development; (b) promote education reform; and (c) effectively reach at-risk students. The SPC was also founded on the “socio-cultural tenet” that learning is social and best takes place when students converse with others, who are more knowledgeable and experienced, as they collaboratively work at completely a particular task (Vygotsky, 1978). The SPC is currently being used as a research instrument that serves as a predictor variable in research on the effectiveness of the standards in both culturally and linguistically diverse instructional settings.

The goal of the quantitative research, which included a pre- and posttest design, was to construct a 5-point rubric instrument to reliably and validly measure student performance. The efficiency of the instrument would be measured on its: (a) practicality; (b) facility in scoring; and (c) ability to be interpreted easily. The three studies conducted in the research provided evidence of: (a) interrater reliability; (b) concurrent validity; (c) criterion-related validity, which in turn supports the validity of the interpretations collected with the SPC instrument; and (d) validity in the constructs measured.
Tharp, Estrada, Dalton, and Yamauchi (2000) classified five pedagogy standards that effectively teach at risk students as being: (a) teachers and students working and conversing collaboratively to reach a common goal; (b) language and literacy involvement in all instructional activities; (c) the contextualization of new academic content with prior knowledge; (d) challenging activities require the application of content knowledge; and (e) goal-directed conversations between the teacher and small group instruction.

Gallimore and Tharp (1992) concluded that learning occurs best when the following takes place: (a) collaboration between students and teachers through discussions; (b) meaningful instructional activities that help to connect students’ prior knowledge; and (c) dialogical instruction that takes place within the student’s zone of proximal development (ZPD). ZPD, as defined by Vygotsky is “the difference between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (1978, p. 86).

The first stage of developing the SPC was to devise the elements for each of the standards being assessed. There were critical differences of each dimension, underlying each of the standards being assessed, and is used to define “theoretically equivalent changes of enactment” of each of the standards. Participants collaborated in creating a product or achieving a common goal in a joint productive activity (JPA). The purpose of this goal-directed collaboration was to: (a) allow participants of varying abilities to interact; (b) exchange information; (c) share viewpoints; and (d) problem solve to enhance thinking strategies.
Teachers may more effectively assist students, according to Tharp (2000) by: (a) allowing the information to be understandable to students; (b) responding to student needs; (c) correcting students’ misconceptions; (d) assisting student language development, which is highly correlated with overall school achievement, through modeling and rephrasing; and (e) generating language use by requiring students to master the language through completing tasks. Meaningful discourse encourages: (a) mental functions; (b) attention; (c) logical memory; and (d) the formation of concepts (Wertsch, 1985). Consequently, the most effective form of instruction is that which (a) encourages language use; and (b) requires students to gain enough mastery of the language to complete a given learning task.

The first study revealed five levels of enactment, ranging values from a scale of 0 to 4 with the following dimensions: (a) the standard is not present; (b) elements of the standard are emerging; (c) the standard is partly developed; (d) the standard is fully implemented; and (e) at least three standards are simultaneously integrated in an instructional activity. The next step in developing the SPC was to test the inter-rater reliability and inter-coder agreement, while trained observers conducted the observations in pairs (see Figure 38).
The sample population in the first study consisted of 24 public middle school teachers from an American Indian town in New Mexico. The student population was 99.7% Native American with 92% on free or reduced lunch. The sampling at the school included all teachers and was 79% \( (n = 19) \) Euro-American and 21% Native American \( (n = 5) \), with 54% of the teachers being men and 46% women. The ages of the teachers ranged from 22 to 69 years, with the years of teaching experience ranging from 1-41 years.

The school was participating in a 5-year collaborative reform effort supported by university-based researchers who focused on the Standards of Effective Pedagogy. The
standardized test scores, of 6th though 8th graders, ranked between the 87th and 89th percentile, out of a total of 89 schools.

Doherty, Hilberg, Epaloose, and Tharp (2002) used archived videotapes of classroom instruction, to train four researchers who were familiar with the standards, prior to collecting data. The lead researcher began with formal data collection with the use of live (N = 34) and videotaped (N = 32) observations of teachers from the sample once a predetermined level of agreement ($r^s = .95$) was established with the trainees’ ratings. The paired observers made their SPC ratings over four phases of data collection, using different pairs in each phase. The inter-rater agreement was assessed and modified cell criteria after each phase in order to: (a) elicit any distinctions between levels to increase the agreement between coders and (b) to widen the SPC’s applicability to a larger range of educational contexts and grade levels.

The results form the ratings made with the final version of phase 4 of the SPC revealed a higher inter-coder agreement. Spearman’s rank order coefficients ranged form .86 to .98 on the subscales and .96 for the total SPC score. Kendall’s Ws ranged from .80 to .88 for subscales and 96 for the overall total scores. The results of Study 1 also exposed how the SPC showed signs of a strong agreement between the raters for live and videotaped observations from teachers across a wide range of grade levels and subject areas. After the concurrent validity was assessed, a significant relationship was found: (a) between the SPC and comparison measures; and (b) with teacher who incorporated more of the pedagogical strategies measured by TROS and COM. It is possible, however, that the comparisons of the measures were limited by the classroom organization being observed. Classroom organization, on the other hand, does not restrict
the TROS and COM scores. The comparisons do indeed support the notion that the SPC offers convincing information concerning teacher performance.

The second study began by generating estimates of the concurrent validity of the ratings, estimate by the degree for which scores on an instrument are related to other instrument scores that measure the same constructs administered the first time (Fraenkel & Wallen, 1993). The SPC was used in conjunction with other instruments measuring similar pedagogical constructs in order to establish concurrent validity. The procedure for the second study required that the SPC data be collected from a pair of trained observers over the period of one semester. The observations, separated by seven weeks, consisted of two 45-minute observations of language arts instruction. After carrying out the observations, the interceded agreement was assessed, resulting with Kendall’s W on SPC total scores at .91.

The participants in the second study involved 42 teachers from 13 south Florida public elementary schools from 1st to 5th grade. All of the participants were involved in a longitudinal study that compared the effectiveness of state-mandated comprehensive school reform models. The students ranged from wide ethnic, cultural, socioeconomic and language backgrounds from both urban and suburban schools. Seventeen percent of the students were immigrants and 33% had limited proficiency in English. Forty-four percent of the students were Hispanic, 33% African American, 18% European American, 4% Asian, less than 1% Native American, 25% had limited skills in English proficiency, and 13% received free or reduced lunch. Forty-three percent of the teachers from this sample were European Americans (n =18), 33% were Hispanic (n =14), and 24% were African American (n =10).
The Teacher Roles Observation Schedule (TROS) used dichotomous and polytomous items to record information on classroom instruction (Waxman, Wang, Lindvall, & Anderson, 1990). The following domains were assessed: (a) instructional settings; (b) nature of teacher's interactions; and (c) instructional content (see Figure 39).
Table 2.—Standards Performance Continuum (Rubric for Observing Classroom Enactments of CRDE’s Standards for Effective Pedagogy)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Not observed</th>
<th>Emerging</th>
<th>Developing</th>
<th>Enacting</th>
<th>Integrating</th>
</tr>
</thead>
<tbody>
<tr>
<td>General definition</td>
<td>The standard is not observed.</td>
<td>One or more elements of the standard are enacted.</td>
<td>The teacher designs and enacts activities that demonstrate a complete enactment of the standard.</td>
<td>The teacher designs and enacts activities that demonstrate a complete enactment of the standard.</td>
<td>The teacher designs and enacts activities that demonstrate a complete enactment of the standard.</td>
</tr>
<tr>
<td>Joint productive activity</td>
<td>Joint productive activity is not observed.</td>
<td>Students are seated with a partner or group, AND (a) collaborate or assist one another; OR (b) are instructed in how to work in groups, OR (c) contribute individual work, not requiring collaboration, to a joint product.</td>
<td>The teacher and students collaborate on a joint product.</td>
<td>The teacher and a small group of students collaborate on a joint product.</td>
<td>The teacher designs, enacts, and assists in activities that demonstrate skilful integration of multiple standards simultaneously.</td>
</tr>
<tr>
<td>Teacher and students producing together</td>
<td>Language and literacy development</td>
<td>Language and literacy development is not observed.</td>
<td>The teacher (a) explicitly models appropriate language; OR (b) students engage in brief, repetitive, or drill-like reading, writing, or speaking activities; OR (c) students engage in social talk while working.</td>
<td>The teacher provides structured opportunities for academic language development in sustained reading, writing, or speaking activities.</td>
<td>The teacher designs and enacts instructional activities that generate language expression and development of content vocabulary, AND assist student language expression and development through questioning, rephrasing, or modeling.</td>
</tr>
<tr>
<td>Developing language and literacy across the curriculum</td>
<td>Contextualization</td>
<td>Contextualization is not observed.</td>
<td>The teacher makes incidental connections between students’ prior experience/knowledge from home, school, or community and the new activity/information.</td>
<td>The teacher integrates the new activity/information with what students already know from home, school, or community.</td>
<td>The teacher designs, enacts, and assists in language development activities that demonstrate skilful integration of multiple standards simultaneously.</td>
</tr>
<tr>
<td>Challenging activities</td>
<td>Challenging activity is not observed.</td>
<td>The teacher (a) accommodates students’ varied ability levels, OR (b) connects student comments to content concepts, OR (c) sets and presents standards for student performance, OR (d) provides students with feedback on their performance.</td>
<td>The teacher designs and enacts activities that connect instructional activities to academic content OR advances student understanding to more complex levels.</td>
<td>The teacher designs and enacts activities that are connected to academic content; assists and uses challenging standards to advance student understanding to more complex levels; AND provides students with feedback on their performance.</td>
<td>The teacher designs and enacts instructional activities that demonstrate skilful integration of multiple standards simultaneously.</td>
</tr>
<tr>
<td>Teaching complex thinking</td>
<td>Instructional conversation</td>
<td>Instructional conversation is not observed.</td>
<td>The teacher converses with a small group of students on an academic topic AND elicits student talk with questioning, listening, or rephrasing.</td>
<td>The teacher designs and enacts an instructional conversation (IC) with a clear academic goal; listens carefully to assess and assist student understanding; AND questions students on their views, judgments, or rationales. All students are included in the IC, AND student talk occurs at higher rates than teacher talk.</td>
<td>The teacher designs, enacts, and assists in instructional conversations that demonstrate skilful integration of multiple standards simultaneously.</td>
</tr>
<tr>
<td>Instructional conversation</td>
<td>Teaching through conversation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: CRDE = Center for Research on Education, Diversity & Excellence.
The Classroom Observation Measure or COM (Ross & Smith, 1996) incorporated a variety of data types to measure: (a) classroom characteristics; (b) teacher and student behaviors; and (c) instructional strategies. The overall observation schedule (Part 4) was used to assess classroom organization and teaching strategies, which consisted of twenty Likert-type scale items. The following are examples of some of the teaching strategies assessed: (a) continued writing activities; (b) technology; (c) cooperative learning; (d) student discussions; (e) feedback; and (f) tutoring. The observational period was the unit of analysis. The COM ratings revealed a high inter-coder agreement and solid estimates of validity (Ross & Smith, 1996).

Data from live observations was collected during the validations stage. There were three noted procedural differences between the developmental stage in Study 1 and the validation stages: (a) two trained observers collected data separately instead of conducting paired observations; (b) the sampling in Study 1 included all of the teachers from the school site and observations from 13 elementary schools, whereas the site coordinator arranged the observations in Study 2; and (c) the SPC, TROS, and COM ratings were done collectively for comparisons with the validation measures, with two sets of SPC ratings performed in each observation. One set of SPC data included multiple ratings of the observation period to compare with the TROS, and the second set of SPC data contained a single set of scores for the duration of the entire observational period for the comparisons with the COM.

The results of the comparisons between the SPC, TROS, and COM reported a considerable correlation between the total SPC scores and the added scores on the TROS Purpose of Interaction and Nature of Interaction items $r_{sub} = .44$ and $.33$. 

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The SPC subscales resulted in being more powerfully related to the Purpose of Interaction items than did the Nature of Interaction items (see Table 3). A significant relationship was found between the COM and all the SPC subscales, \( r^{sub} s^A(176) = .54, p < .001 \).

Criterion-related validity was essential in determining the validity of interpretations of the SPC data in Study 3. Doherty, Hilberg, Epaloose, and Tharp (2002) inspected the relationship between the teachers’ use of the standards in language arts instructional time and student achievement to estimate the predictive validity. The hypothesis was that greater SPC scores would be associated with higher norm equivalent scores on the end-of-the-year standardized tests of: (a) comprehension; (b) language; (c) reading; (d) spelling; and (e) vocabulary achievement.

The participants in Study 3 included fifteen teachers (2 men, 13 women) and 266 students (137 boys and 129 girls) from a rural central California public elementary school consisting of mostly low-income Hispanic families. The years of teaching experience ranged from 1 to 26 \( (M = 6.01, SD = 5.42) \). Ninety percent of the students were Hispanic, 78% were on free or reduced lunch, 68% were limited in English proficiency, and 38% came from migrant worker homes. Eighty-two students were in third grade (31%), 101 were in fourth grade (38%), and 83 were in fifth grade (31%).

The results of the outcome measures were six indicators of student achievement estimated by the end-of-the-year Stanford Achievement Test-9 (SAT-9) subtest scores: (a) overall achievement; (b) comprehension; (c) language; (d) reading; (e) spelling; and (f) vocabulary. All subtests were averaged to find the overall NCE score. The estimated
gain scores (EGS) were then computed for each SAT-9 subtest to help control the tendency of scores regressing to the mean on repeated measures of parallel tests.

The EGS was determined by subtracting the students’ predicted scores based on students’ performance the previous year. The independent variables were listed as followed: (a) teacher experience; (b) grade level; (c) language mode of proficiency; and (d) teachers’ SPC scores, ranging from 4.00 to 16.50 with a mean of 10.11 and a standard deviation of 2.55. The non-parametric tests (Kruskal-Wallis) showed differences in the total SPC scores from the third grade ($M=9.09$, $SD=2.42$). The combined fourth and fifth grades ($M=10.59$, $SD=2.46$) were not as significantly different with $\chi^2(2) = 1.71$ ($p = .43$).

The SPC did, however, differ considerably between modes of instruction, $\chi^2(2) = 57.14$ ($p < .001$). The highest SPC scores came from the teachers in SEI classrooms, followed then by students in the English only and bilingual classes ($MS=10.91, 10.08, and 9.81; SD's = .37, 1.43, and 3.33$). The total SPC scores were negatively correlated with the years of teaching experience, $r(14) = -.66$ ($p = .02$). Table 9 illustrates the inter-correlations for all the SPC subscales that were substantially inter-correlated with coefficients ranging from .15 to .82. Since the total of the SPC scores are ordinal data, they are not usually distributed (see Table 13) (Harwell and Gatti, 2001).
Table 13
Correlations between Scores on the Standards Performance Continuum (SPC), Teacher Roles Observation Schedule (TROS), and Classroom Observation Measure (COM)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Standards for effective pedagogy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>JPA</td>
</tr>
<tr>
<td>TROS^2</td>
<td></td>
</tr>
<tr>
<td>Purpose of interaction subscales</td>
<td>.49</td>
</tr>
<tr>
<td></td>
<td>.74</td>
</tr>
<tr>
<td>Purpose of interaction total</td>
<td>.22</td>
</tr>
<tr>
<td></td>
<td>.05</td>
</tr>
<tr>
<td>Nature of interaction total</td>
<td>.13</td>
</tr>
<tr>
<td></td>
<td>.02</td>
</tr>
<tr>
<td>COMP total</td>
<td>.52</td>
</tr>
<tr>
<td></td>
<td>.27</td>
</tr>
<tr>
<td>SPC subscale intercorrelations</td>
<td></td>
</tr>
<tr>
<td>JPA</td>
<td>—</td>
</tr>
<tr>
<td>LLD</td>
<td>.37</td>
</tr>
<tr>
<td>CTX</td>
<td>.05</td>
</tr>
<tr>
<td>CA</td>
<td>.24</td>
</tr>
<tr>
<td>IC</td>
<td>.24</td>
</tr>
<tr>
<td>Total</td>
<td>.42</td>
</tr>
</tbody>
</table>

Note. JPA = joint productive activity; LLD = language and literacy development; CTX = contextualization; CA = challenging activities; IC = instructional conversation. Nonsignificant correlations are italicized. NA = TROS purpose section has no items related to contextualization. *n = 137, % = 50.


An inspection of the scatterplot was conducted, and the result was that the total SPC scores were positively skewed. A square-root transformation was then used to make the distribution normal (Tabachnick and Fidell, 1989). A hierarchical regression analyses on each of the following dependent variables was run to estimate the SPC’s contribution to the prediction of student achievement: (a) grade level; (b) language ability; or (c) teacher experience. The standard regression coefficient (B) and t-test of the significance of each variable, and the multiple correlation coefficient (R), R^2, degrees of freedom and the F statistic for each tested model may be seen in Table 14.
<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>t</th>
<th>R</th>
<th>R²</th>
<th>df</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall NCE</td>
<td>-0.10</td>
<td>-0.16</td>
<td>0.01</td>
<td>0.00</td>
<td>1,264</td>
<td>0.03</td>
</tr>
<tr>
<td>Teacher experience</td>
<td>-0.25</td>
<td>-0.36</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Grade</td>
<td>-1.43</td>
<td>-2.32*</td>
<td>0.15</td>
<td>0.02</td>
<td>3,262</td>
<td>1.87</td>
</tr>
<tr>
<td>Mode</td>
<td>0.286</td>
<td>3.17*</td>
<td>0.24</td>
<td>0.06</td>
<td>4,261</td>
<td>3.97*</td>
</tr>
<tr>
<td>SPC total scores</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Comprehension</td>
<td>-0.06</td>
<td>-0.10</td>
<td>0.01</td>
<td>0.00</td>
<td>1,264</td>
<td>0.01</td>
</tr>
<tr>
<td>Teacher experience</td>
<td>-0.30</td>
<td>-0.44</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Grade</td>
<td>-1.34</td>
<td>-2.17*</td>
<td>0.14</td>
<td>0.02</td>
<td>3,262</td>
<td>1.66</td>
</tr>
<tr>
<td>Mode</td>
<td>0.223</td>
<td>2.45*</td>
<td>0.20</td>
<td>0.04</td>
<td>4,261</td>
<td>2.77*</td>
</tr>
<tr>
<td>SPC total</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Language</td>
<td>-0.06</td>
<td>-0.75</td>
<td>0.05</td>
<td>0.00</td>
<td>1,264</td>
<td>0.57</td>
</tr>
<tr>
<td>Teacher experience</td>
<td>-0.21</td>
<td>-3.12*</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Grade</td>
<td>-0.070</td>
<td>-1.14</td>
<td>0.21</td>
<td>0.04</td>
<td>3,262</td>
<td>3.93*</td>
</tr>
<tr>
<td>Mode</td>
<td>0.050</td>
<td>0.56</td>
<td>0.21</td>
<td>0.04</td>
<td>4,261</td>
<td>3.02*</td>
</tr>
<tr>
<td>SPC total</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Reading</td>
<td>-0.059</td>
<td>-0.95</td>
<td>0.06</td>
<td>0.00</td>
<td>1,264</td>
<td>0.91</td>
</tr>
<tr>
<td>Teacher experience</td>
<td>0.054</td>
<td>0.77</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Grade</td>
<td>-0.099</td>
<td>-1.60</td>
<td>0.12</td>
<td>0.02</td>
<td>3,262</td>
<td>1.34</td>
</tr>
<tr>
<td>Mode</td>
<td>0.258</td>
<td>2.85*</td>
<td>0.21</td>
<td>0.05</td>
<td>4,261</td>
<td>3.06*</td>
</tr>
<tr>
<td>SPC total</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Spelling</td>
<td>0.069</td>
<td>1.13</td>
<td>0.07</td>
<td>0.01</td>
<td>1,264</td>
<td>1.28</td>
</tr>
<tr>
<td>Teacher experience</td>
<td>-0.008</td>
<td>-0.11</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Grade</td>
<td>-0.151</td>
<td>-2.47*</td>
<td>0.17</td>
<td>0.03</td>
<td>3,262</td>
<td>2.47</td>
</tr>
<tr>
<td>Mode</td>
<td>0.290</td>
<td>3.24*</td>
<td>0.26</td>
<td>0.07</td>
<td>4,261</td>
<td>4.54*</td>
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<tr>
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<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
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</tr>
<tr>
<td>Vocabulary</td>
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<td>1.81</td>
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<td>0.01</td>
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<td>0.24</td>
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<td>3,139</td>
<td>2.96*</td>
</tr>
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</table>

Note. NCE = normal curve equivalent. SPC = Standards Performance Continuum. Dashes indicate that the data are the same for grade and mode, which were entered on the same step in the analysis.

*p < .05.

The effects that the independent variables caused on student gains typified the pattern of effects on the following areas: (a) comprehension; (b) reading; (c) spelling; and (d) vocabulary. Consequently, teacher experience was not a reliable enough predictor of achievement gains on any of the tests. However, grade level and mode of instruction combined together allotted for a significant amount of variance on the language subtest. The $t$-test of the coefficient for SPC total scores was significant ($p = .05$) on the vocabulary subtest. When the preceded analysis was repeated using the untransformed SPC scores, the standardized coefficient did not change, yet the $p$ value increased from .05 to 10.

The results of the null and marginal effects of the SPC scores on the language and vocabulary subtests were not as predicted, and therefore deflated the hypothesis that incorporating the standards facilitate language development in English-language learners. There are three possibilities concerning the reasons behind the results: (a) Tharp’s theory (2000) is invalid; (b) the SPC does not validly predict student achievement; and (c) the language of instruction is an intervening variable, which in turn affects student achievement on English language and vocabulary tests.

Doherty, Hilberg, Epaloose, and Tharp (2002) tested the possibility of language instruction, as an intervening variable affecting achievement in language and vocabulary, by removing the mode of instruction from the model and collapsing the three-level categorical variable (English only, structured English instruction, and bilingual) into a dichotomous variable form of English only versus Spanish instruction. The researchers next ran the hierarchical regression models, which contained: (a) teacher experience; (b) grade level; and (c) the transformed SPC scores from the language and vocabulary
subtests individually for English and Spanish instruction. Table 9 reveals the results of
the analyses that support the SPC scores accurately predicting achievement gains in
language and vocabulary for students instructed in English. On the other hand, teachers’
use of the standards was unconnected to students’ performance on language and
vocabulary tests for those students taught in Spanish.

The validity and accuracy of the interpretations made from the data collected by
the SPC was determined by: (a) comparing the coexisting ratings of the same teachers
who came from different measures of comparable constructs; and (b) assessing the
reliability of the predictions deriving from the SPC scores on related criterion.

Study 3 supplied even further backing for the validity of the SPC rating
interpretations. The results of the tests performed on the SPC’s criterion-related validity
supported the hypothesis of teachers who use the standards more during the instructional
time of at-risk students reliably determined higher student achievement on standardized
tests. Higher SPC scores were associated with higher achievement gains, thus serving as
a greater predictor than the SAT-9 scores form the previous year.

Recommendations for further study suggest that: (a) researchers should conduct
controlled studies to explore the relationship between the teachers’ implementation of the
standards and students’ Spanish vocabulary and affect on language development; (b) the
inter-rater reliability ought to also be assessed prior to collecting data as part of training
on using the SPC measure; and (c) periodic training be conducted to maintain accuracy
and to minimize the deterioration of observer skill, since observations are performed over
a lengthy period of time.
Further recommendations included more research and development in the area of how arts integrated activities in conjunction with efficient test-preparation programs directly impact standardized reading test scores. Reviewing the available literature has pointed out the need for more articles in scholarly journals, in regards to the direct effect arts-integrated instruction has on the mastery of state reading standards. Therefore, new research must be developed which examines the specific art activities and test preparation programs that reveal adequate yearly progress on state standardized tests.
Chapter 3

Research Methodology

This study sought to determine whether multiple learning competencies or dominant intelligences of K-12 educators from a Southeast Florida public school district differed among arts and non-arts teachers. Gardner’s theory of multiple intelligences was the foundation of this research study. Additionally, the study searched for influential relationships between learning competencies and teacher efficacy and how teacher demographics affected the levels of teacher efficacy.

Purpose of the Study

The purpose of this non-experimental causal-comparative study was to determine whether the subject areas educators taught determined a pattern of learning competencies among non-arts and art teachers, as measured by the Multiple Intelligences Test (Chislet & Chapman, 2005). This study also explored a possible relationship between certain dominant intelligences (multiple intelligences) and the results of teachers’ perceptions of teacher efficacy, as measured by the Teachers’ Sense of Efficacy Scale Test (Tschannen-Moran & Hoy, 2001). The ultimate goal of this study was to conclude which dominant intelligences had the most profound impact on teacher efficacy in the areas of (a) student engagement; (b) instructional practices; and (c) classroom management.

Hypotheses

This study investigated the relationship between the learning competencies of art and non-arts teachers. In addition, this project explored the teachers’ dominant intelligences that had a predictive value on their perceptions of teacher efficacy and how
teacher demographics influenced the levels of teacher efficacy. Therefore, the researcher hypothesized the following:

H1. Non-arts teachers would show stronger indicators of possessing linguistic and logical-mathematical dominant intelligences.

H2. Art teachers’ dominant intelligences would reveal higher degrees of musical, bodily-kinesthetic, spatial-visual, interpersonal, and intra-personal intelligences.

H3. The art teachers’ dominant intelligences would indicate higher levels of teacher efficacy in the areas of: (a) student engagement; (b) instructional practices; and (c) classroom management.

Research Questions

Based on the previous hypotheses, the researcher developed the following research questions:

1. Would non-arts teachers show stronger indicators of possessing linguistic and logical-mathematical dominant intelligences?

2. Would arts teachers’ dominant intelligences demonstrate higher degrees of musical, bodily-kinesthetic, spatial-visual, interpersonal, and intra-personal intelligences?

3. Which form of dominant intelligence would have the greatest determining value on higher levels of teacher efficacy in the areas of: (a) student engagement; (b) instructional practices; and (c) classroom management?
Research Design

This non-experimental study used a causal-comparative quantitative research design, which employed two survey instruments containing Likert scale questions and a teacher demographic survey developed by the researcher. The dependent variables were the attitudes that art and non-art teachers displayed concerning teacher efficacy, measured by the Teachers' Sense of Efficacy Scale (Tschannnen-Moran & Hoy, 2001). The independent variable was the dominant intelligence type or learning competency measured by the Multiple Intelligence Test (Chislett & Chapman, 2005).

Dependent Variables

The dependent variables in this study defined by the researcher were as follows: (a) student engagement; (b) instructional strategies; and (c) classroom management, according to the participants' responses to the Teachers' Sense of Teacher Efficacy survey (Tschannnen-Moran & Hoy, 2001). The participants indicate their personal point-of-view by rating each of the seventeen statements, reflecting the three areas of teacher efficacy, on a Likert Scale ranging from 1 to 6.

The teachers' subscale scores were computed by unweighted means of the items that loaded each factor. The questions items were grouped as the following for each area of teacher efficacy: (a) student engagement (items 1,2,4,6,9,12,14, and22); (b) instructional strategies (items 7,10,11,17,18,20,23, and 24); and (c) classroom management (items 3,5,8,13,15,16,19, and 21).

Independent Variables

The independent variable were the participants' score on the Multiple Intelligence Test (Chislett & Chapman, 2005), which determined the dominant intelligence or
learning competency of both arts and non-arts teachers. The participants responded to seventy statements, on a Likert Scale of between one and four, which was calculated to conclude teachers' dominant intelligences.

The other independent variables were the teachers' demographic characteristics from the researcher's Teacher Demographic Profile Checklist. The teachers' first language (nominal) specified English, Spanish, or other as the variables. Age (continuous) was grouped in ranges from 20-30, 31-4, 41-50, 51-60, and 61 and over. Next, gender (dichotomous) was simply checked as either male or female. The independent variable of race (nominal) was determined as Caucasian, African American, Hispanic, Asian, or other. For the independent variable of marital status (nominal), teachers chose married, single, or divorced. The participants' familial status (nominal) was noted as one child, two children, and three or more dependents. Next, the teachers' educational level (ordinal) was categorized as undergraduate, Master's degree, doctorate degree, or other. The independent variable of teaching experience (continuous) was determined by the number of years of teaching experience ranging from 1-5, 6-10, 11-15, 16-20, 21-25, 26-30, and 31 years or more of teaching experience. The subject areas taught (continuous) were noted as English or Reading, Math, Science, Social Studies or History, Writing, Physical Education, Visual Arts, Theater, Music, Foreign Language, ESE (Exceptional Student Education), ESOL (English As A Second Language), or other. Finally, the grade level (continuous) that the participants teach was recorded as Kindergarten, First, Second, Third, Fourth, Fifth, Sixth, Seventh, Eighth, Ninth, Tenth, Eleventh, or Twelfth.
Target Population

The primary investigator used a convenience sample to attain a target population that would consist of K-12 educators who taught either art or non-arts subject areas in a Southeast Florida public school system. The target population selection for this study was based on a voluntary basis.

Accessible Population

The accessible population was K-12 teachers who responded to the online research study that was forwarded by public school teachers working in a leadership capacity at various arts and non-arts teacher organizations in Southeast Florida. The Classroom Teacher Association (CTA) forwarded the research instruments to 5,900 union members working in the same Southeast school district. Approximately 6,000 educators received the survey instruments, and the researcher was anticipating a sample size of approximately 200 participants from both the arts and non-arts subject areas. The participants had to be able to read, write, and speak English. The education levels of the participants varied from a four-year degree to a doctorate degree.

Sampling Plan

A non-probability sampling plan was used to obtain the sample for the purposes of this study that would (a) assume an even distribution of characteristics within the population to determine a representative sample; (b) provide descriptive information regarding the population; and (c) compare some of the survey results with available information about the population to address data quality. The researcher obtained permission from the Classroom Teachers Association (CTA) and representatives from the
various teacher organizations in a Southeast Florida county to forward the survey instruments to the voluntary participants.

**Instruments**

**The Teacher Demographic Profile Checklist (See Appendix A)**

For the purposes of data analysis, the researcher designed a checklist instrument to measure teacher demographic characteristics. The checklist comprised of a series of questions pertaining to: (a) first language; (b) age; (c) gender; (d) race; (e) marital status; (f) family status; (g) education level; (h) number of years teaching; (i) subject area taught; and (j) grade level taught. The checklist instrument served the same reliability and validity requirements, along with the responses to the items, from the self-reporting participants.

**The Multiple Intelligences Test (See Appendix B)**

The researcher used the Multiple Intelligence Test developed by Chislett & Chapman (2005) to measure the variable of learning competencies. The instrument measured the strengths and potential of the participants in the areas of: (a) linguistic; (b) logical-mathematical; (c) musical; (d) bodily-kinesthetic; (e) spatial-visual; (f) interpersonal; and (g) intra-personal intelligences. There were 70 questions in all that determine the learners’ strongest forms of intelligence, based on a Likert scale between 1 and 4.

**The Teachers’ Sense of Efficacy Scale (See Appendix C)**

The researcher utilized the Teachers’ Sense of Efficacy Scale developed by Tschannnen-Moran & Hoy (2001) to measure the variable of teacher efficacy. The instrument measured teachers’ perceptions across three areas: (a) student engagement; (b)
instructional strategies; and (c) classroom management. The participants’ score on the Teachers’ Sense of Efficacy Scale was based on 22 questions that followed a Likert scale of 1 to 6 including the following: (1) nothing, (2) very little, (3) some influence, (4) quite a bit; and (5) a great deal. After participants completed the survey, the researcher was able to determine each teacher’s degree of teacher efficacy in the three areas of (a) student engagement; (b) instructional strategies; and (c) classroom management.

Procedures: Ethical Considerations and Data Collection Methods

The researcher took the following procedures into account to ensure ethical considerations during the data collection methods:

1. Obtained permission to use both survey instruments selected in this study from Chislett & Chapman and Tschannnen-Moran & Hoy (September 27, 2008);

2. Acquired approval from the contacts of the art and non-art teacher organizations in a Southeast Florida school district to forward surveys to teachers electronically (October 8, 2008);

3. Obtained approval from the president of CTA (Classroom Teachers Organization) to forward both survey instruments to 5,900 teachers from a Southeast Florida school district (October 6, 2008);

4. Attained conditional approval from the Institutional Review Board of Lynn University;

5. Submitted the conditional IRB approval to the Research and Evaluation Department at the Southeast Florida school district to confirm the approval to conduct a research study;
6. Informed the Institutional Review Board of Lynn University of approval from the Southeast Florida school district to conduct research;

7. Forwarded the electronic surveys from the teacher contacts and CTA to teachers in a Southeast Florida school district;

8. Invited the participants to complete the surveys by clicking the invitation link. The voluntary consent form letter was included so that the participants could choose to participate or not. The voluntary consent letter indicated the researcher's phone number and email;

9. Allowed six weeks for data collection. Each participant completed the research surveys voluntarily;

10. Coded each survey with a number to identify the participant, beginning with 1, for matching purposes and to ensure confidentiality;

11. Used the Multiple Intelligences Test to determine the learning style preferences;

12. Gathered background information on the participants and explored possible connections between teacher efficacy and the results from the Teacher Demographic Profile Checklist;

13. Measured the participating teachers' instructional effectiveness with the Teacher's Sense of Efficacy Scale Test; and

14. Notified the IRB at the conclusion of the study to report "Termination of Project."
Methods of Data Analysis

The researcher collected the data and entered it into the Statistical Package for the Social Sciences (SPSS) Version 14.0, a computer program for statistical analyses, after the administration and completion of the data-gathering instruments. Next, the researcher performed a frequency distribution to check for coding errors. All data will be stored for a period of five years, in a secure, locked depository box, and then destroyed.

The researcher determined reliability estimates with the Cronbach’s Alpha and Spearman-Brown prophecy formulas. Criterion-related validity was established with Multiple Regression and an Analysis of Variance ANOVA. The researcher chose an ANOVA to test the three research questions, which would assess the three correlated dependent variables. The dependent variables were (a) student engagement; (b) instructional strategies; and (c) classroom management on the Teachers’ Sense of Teacher Efficacy survey (Tschannnen-Moran & Hoy, 2001).

The researcher identified whether changes in the independent variables had a significant effect on the dependent variables and detected the interactions among the independent variables to ascertain whether there was an association among dependent variables (French, Poulsen, and Yu, 2002).

Descriptive statistics summarized the characteristics of the sample used in the research study. The researcher distributed the amount of participants who were art and non-arts teachers by selecting participants from each learning preference style type indicator, prior to conducting data analysis.

The research questions were answered with descriptive and inferential statistics. The researcher used Multiple Regression for data analysis and explored the contribution
of the independent variable of learning preference styles and other intervening, mediating or dependent variables. Teacher demographic characteristics and teachers’ perceptions of teacher efficacy were included in the data analysis.

For question one, "Would non-art teachers show stronger indicators of possessing linguistic and logical-mathematical dominant intelligences?" the researcher used an ANOVA for data analysis. This compared the differences in teacher demographic characteristics (first language, age, gender, race, marital status, familial status, education level, number of years teaching, subject areas taught, and grade level taught) with learning competencies.

For question two, "Would art teachers’ learning competencies demonstrate higher degrees of musical, bodily-kinesthetic, spatial-visual, interpersonal, and intra-personal intelligences?" the researcher used an Analysis of Variance (ANOVA) for data analysis. The ANOVA compared the differences between learning competencies and teacher demographics. The researcher also used an ANOVA for data analysis to determine the predictive values of the Multiple Intelligence Test, which measured teachers’ dominant intelligences and the Teachers’ Sense of Efficacy Scale, which measured teacher efficacy. The scores of both instruments were used to determine if a correlation existed between teachers’ learning competencies and teacher efficacy. The teacher demographic characteristics checklist was explored in the descriptive statistics involved in the research study.

For question three, "Which type of learning competency would have the greatest predictive value on high levels of teacher efficacy?" the researcher used the Multiple Regression Model for data analysis. This model compared differences in teacher
demographic characteristics and teacher efficacy. The researcher used a Multiple Regression Model for data analysis and explained the predictive value of teacher demographic characteristics on teacher efficacy, including which dominant intelligences would reveal higher levels of teacher efficacy in the areas of (a) student engagement; (b) instructional practices; and (c) classroom management.

Evaluation of Research Methods

External Validity

Strengths

The external validity of the participants in the research study was controlled by the following: (a) all were K-12 public school employees in the same county in Florida; (b) all had attained an educational level varying from a four-year degree to a doctorate degree; and (c) the majority of the participants were required to attend professional developments that addressed both learning competencies and teacher efficacy.

There were no pretest treatment interactions, since there was no pretest involved in the study that could have an influence on a posttest. There also were no multiple treatment interferences or treatment diffusion, due to the fact that the participants did not receive any treatments.

The researcher created the Student Demographic Profile Checklist to help limit any experimenter effects. However, there was a possibility of reactive effects in how the participants responded to the instrument.

The strengths of sending surveys instruments via e-mail were: (a) it was cost effective; (b) it was easier to edit, analyze, and sort data; (c) the transmission time was
faster than traditional mail surveys; and d) there was a higher response rate; (e) responses tended to be more candid.

**Internal Validity**

The instrumentation in the research study did not change before, during, or after the study was in progress. The researcher did not anticipate any events that might occur between a pretest and posttest, since a pretest was not administered in the research study. Maturation or selection-maturation interaction was unlikely to occur, thus eliminating the risk of the data collection being invalid. An additional strength in the study was the higher response rate and more candid responses from candidates that resulted from using electronic surveys.

The Multiple Intelligences Test and the Teachers’ Sense of Efficacy Scale were reliable instruments that allowed for strength of internal validity. Since there were no control and experimental groups, there was no differential selection of participants. The anticipated sample size was large enough to conduct statistical analysis.

**Threats to Validity**

The participants in the study were self-selected from the convenient sample, thus posing a potential threat to validity. The results of both instruments in this study were tallied under the assumption that the participants had answered the questions to the best of their abilities. The confounding variables were the teacher demographic characteristics, since it was possible that demographics could play an adverse role on the results of the study.

The weaknesses of survey instruments being administered on-line were: (a) there might be lower levels of confidentiality due to the open nature of most online networks;
orientation to the computer online systems might be necessary; (c) potential technical problems with hardware and software could occur; and (d) the higher response rate occurred during the first few days only.

**Summary**

The goal of this non-experimental causal-comparative quantitative research study was to determine whether teachers’ learning competencies had a predictive value on teacher efficacy, including the possible predictive values of teacher demographic characteristics. The particular research design chosen allowed the researcher to evaluate and compare the data collected from both instruments. The analysis of the Multiple Intelligences Test and the Teachers’ Sense of Efficacy Scale, along with the teacher demographic characteristics checklist helped establish any relationships among predictive values.
CHAPTER IV

RESULTS

The purpose of this non-experimental causal-comparative study was to determine whether the subject areas educators taught determined a pattern of learning competencies among non-arts and art teachers, as measured by the Multiple Intelligences Test (Chislet & Chapman, 2005). This study also sought to establish if there was a possible relationship between certain dominant intelligences (Multiple Intelligences) and the results of teachers’ perceptions of teacher efficacy, as measured by the Teachers' Sense of Efficacy Scale Test (Tschannen-Moran & Hoy, 2001). The ultimate goal of this study was to resolve which dominant intelligences had the most profound impact on teacher efficacy in the areas of (a) student engagement; (b) instructional practices; and (c) classroom management.

This study investigated the relationship between the learning competencies of art and non-arts teachers. In addition, the project explored the predictive value of the dominant intelligences of educators and whether or not teacher demographics influenced levels of teacher efficacy. The primary investigator used a convenience sample to attain a target population that consisted of K-12 educators who taught either art or non-arts subject areas in Palm Beach County.

The researcher hypothesized the following: (a) non-arts teachers would show stronger indicators of possessing linguistic and logical-mathematical dominant intelligences; (b) art teachers’ dominant intelligences would reveal higher degrees of musical, bodily-kinesthetic, spatial-visual, interpersonal, and intra-personal intelligences; and (c) the art teachers’ dominant intelligences would indicate higher levels of teacher
efficacy in the areas of: (a) student engagement; (b) instructional practices; and (c) classroom management.

The independent variable was the participants' score on the Multiple Intelligence Test, which determined the dominant intelligence or learning competency of both arts and non-arts teachers. The participants responded to 70-item survey, on a Likert Scale from 1 to 4, which were then calculated to conclude teachers’ dominant intelligences. The other independent variables were the teachers’ demographic characteristics.

The dependent variables in this study defined by the researcher were as follows: (a) student engagement; (b) instructional strategies; and (c) classroom management, according to the participants’ responses to the Teachers’ Sense of Teacher Efficacy survey.

The researcher collected the data for the research study on June 9, 2009 from 190 Palm Beach County K-12 teachers who responded to three surveys with a total of 104 questions pertaining to (a) teacher demographics; (b) teacher efficacy; and (c) multiple intelligences. The link to the electronic survey was e-mailed to over 4,000 teachers on April 23, 2009. The voluntary participants were allowed six weeks to log onto the survey located on Survey Monkey and complete the instruments.

Cronbach’s Alpha

The teacher demographics resulted as follows: (a) (n=35) males and (n=123) females; (b) (n=74) elementary school teachers and (n=70) teachers from the secondary level; (c) (n=47) reading and writing teachers were grouped as one and included the largest group of participants; (d) (n=37) participants marked “other” as subject area taught; (e) (n=30) participants taught math and science; (f) (n=24) ESE (Exceptional
Students Education) and ESOL (English As A Second Language) teachers; and (g) (n=20) were art teachers, comprising the smallest population.

Coding the Data

The researcher printed the data results from the SPSS program for the following: (a) 10-item teacher demographic survey; (b) 24-item teacher efficacy survey; and (c) 70-item multiple intelligences survey to visually check the responses for any inconsistencies. Each participant was coded in the sequential order of completing the instruments with the 104 responses to all three surveys aligned horizontally. The researcher was next able to detect exactly which participants failed to either complete the survey altogether or answer an adequate number of questions on each instrument. The number 8, symbolizing an unanswered question, was inserted in the blanks of the participants who failed to answer only several of the responses. Consequently, (n=31) participants did not complete the entire survey and were eliminated from the data report.

Descriptive Statistics of the Demographic Variables

The checklist was designed to measure teacher demographic characteristics in the subsequent areas: (a) first language; (b) age; (c) gender; (d) race; (e) marital status; (f) family status; (g) education level; (h) number of years teaching; (i) subject area taught; and (j) grade level taught. The checklist instrument served the same reliability and validity requirements, along with the responses to the items, from the self-reporting participants.

First Language

The initial phase of the analysis began with descriptive statistics evaluating the categorical variables of demographics. The first demographic variable that was measured
was the first language of the respondents. Almost all of the participants, 94% of the total population, stated that English was their native language. The first language of the remaining teachers was as follows: (a) 2.5% spoke Spanish and (b) 2.5% marked “other” as their native language choice.

Age

Age was divided into 4 categories that each included a range of 10 years. The majority of the participants fell in the age group of 41-one years old and higher, at a total of 62.2%, while 37.7% of the respondents were between the ages of 20 and 40.

Gender

The demographic of gender reflected the high percentage of female teachers found in the field of education across the nation with 77.4% of the respondents in the study being female and only 22% male. The dominant gender, in turn, revealed to possess higher degrees of inter-personal intelligence in the overall descriptive statistics. In Table 3, gender also became an important element in the unexpected results of familial status and its positive role on both student engagement and classroom management.

Race

Race resulted as being indicative of the nation’s demographics as well, with 81.1% of the participants falling in the Caucasian category. The largest minority population was Hispanics at 6.9%, followed by all other races at 5.7% and finally African American at 5%.

Marital Status

The largest group of participants, 74.2%, had either been married at some point or was married at the time the research study was conducted. While 58.5% of the
participants were married while the research took place, 15.7% were divorced. Finally, only 23.3% of the teachers who responded were single.

Familial Status

The familial status of the participants revealed that 66.7% of all teachers had one or more children. Only 33.3% of all teachers in the study had no children at all, while 66.7% had one or more children. A total of 21.4% of the respondents had only one child in the family. The results reveal how 45.3% of those teachers who had children, also had larger families of two or more children.

Educational Level

More teachers, a total of 56% of the population, held master’s degrees, doctorates, or other specialization degrees. The four categories for educational level were as follows: (a) undergraduate; (b) master’s; (c) doctorate; and (d) other. Of all the teachers who responded, 51.6% had earned master’s degrees, 44% had undergraduate degrees only, 3.1% had doctorates, and 1.3% had another specialization degree.

Number of Years Teaching

The majority of the participants in the study, 74%, were experienced teachers with six or more years of teaching experience. A slightly lower percentage of the total population, 56%, had worked as teachers between 1 to 15 years. Veteran educators with 16 years or more of experience constituted 39.7% of the total population. Recently hired teachers fell in the next category, with 24.5%, teaching between 1 and 5 years. Next, 21.4% were veteran teachers with 16 to 25 years of experience and 18.3% were teachers with 26 or more years of experience.
Subject Areas Taught

Teachers chose one subject area out of a total of twelve categories for subject area taught: (a) English or reading; (b) math; (c) science; (d) social studies or history; (e) writing; (d) ESE (Exceptional Student Education; (e) ESOL (English As A Second Language; (f) physical education; (g) visual arts; (h) theatre; (i) music; and (j) foreign language.

According to \(n=159\) responses to subject area taught, \(n=20\) were visual arts, theater or music teachers. The researcher, therefore, consolidated the subject areas taught into similar categories, reducing ten variables into five. The following subject area results were combined together: (a) English, reading, writing, social studies and history; (b) math, science, and foreign language; (c) visual arts, theatre, music; (d) ESE and ESOL; and (e) all others.

The results revealed that the same amount of teachers who taught reading, English, writing, social studies or history was 29.6%, followed closely by those teachers who taught other subject areas at 23.3%. Math, science, and foreign language teachers constituted 18.9% of the total population, while ESE and ESOL teachers made up 15.1% of the population, with finally the art teachers at 12.6%.

Grade Level

The participants in the study all worked in the K-12 school system in Palm Beach County. Teachers had the choice of thirteen different grade levels ranging from Kindergarten to grade 12. The researcher condensed the grade level categories into two levels: (a) primary (kindergarten to grade 5) and (b) secondary (grades 6 to 12).
The secondary group of teachers was almost half the size of the total population at 49.7%, while the elementary school teachers consisted of 46.5% of the total respondents. The largest group of secondary teachers, 27.9%, taught the upper high school levels between grades 9 and 12. The results revealed that 23.7% of the elementary school teachers taught from kindergarten to 2nd grade.

Descriptive Statistics on the Index Variables from the Teacher Efficacy Instrument

The researcher used the Teachers' Sense of Efficacy Scale developed by Tschannnen-Moran & Hoy (2001) to measure the variable of teacher efficacy. The instrument measured teachers' perceptions across three areas of teacher efficacy: (a) student engagement; (b) instructional strategies; and (c) classroom management.

The participants' score on the Teachers' Sense of Efficacy Scale was based on 24 questions that followed a Likert scale ranging from 1 to 9: (1-2) nothing; (3-4) very little; (5-6) some influence; (7-8) quite a bit; and (9) a great deal. The researcher consolidated the Likert Scale from 9 options to 5 as follows: (1) nothing or very little; (2) mild influences; (3) considerable influence; (4) quite a bit; and (5) a great deal.

Student Engagement

The respondents scored relatively high on only two out of eight questions that examined how well teachers could effectively reach learners. First, 81% reported high levels of influence regarding how well teachers helped students believe in themselves and 77% helped students think critically.

Contrarily, the respondents did not feel the same degree of confidence in the following areas of student engagement: (a) 74.3% of teachers fostered student creativity; (b) 73% managed difficult students with ease; (c) 71% motivated students with low
interest in school; (d) 67% guided students to value learning; and (e) 64% improved the understanding of failing students.

There was an inconsistent finding in the area of student engagement. The population was comprised of teachers who feel confident about motivating and managing difficult students. Additionally, teachers in the study responded as having a great deal of influence on fostering critical thinking skills and creativity that help build confidence in students.

Perhaps the most disconcerting result of the entire study manifested in the barriers between the teachers’ perceptions of themselves as being interpersonally gifted and efficacious instructors and their actual ability to provide an alternative network support for student achievement. Only 39.6% of the participants showed high levels of influence concerning the ability to assist families at helping their children to succeed in school.

**Instructional Strategies**

Participants showed confidence in three out of the eight questions that examined how well teachers could implement instructional strategies to meet the needs of students. The percentages for the three areas of strength in the area of instructional strategies were: (a) 88% of the respondents exhibited a high level of confidence in responding to difficult questions in a classroom setting; (b) 81% asked challenging questions; and (c) 80% were able to successfully implement alternative strategies to reach the needs of learners.

The respondents felt less of an influence in the following areas of instructional strategies: (a) 78% responded with security towards the ability of being able to implement alternative strategies; (b) 76% felt a strong understanding of how to use a variety of assessment strategies; (c) 73% managed difficult students with ease; (d) 73%
effectively gauged student comprehension of taught material; (e) 72% were confident about adjusting lessons to meet student levels; and (f) 71% motivated students with low interest in school.

Classroom Management

Teachers perceived themselves as demonstrating a high level of influence on four of the eight questions pertaining to classroom management. The area of greatest confidence for teachers was establishing routines to maintain smoothness with 90.5% of the participants responding as having a strong influence on students. A high proportion of the respondents, 82.4%, were certain about the ability to make clear behavioral expectations, followed by 81% of the participants who were able to facilitate students into following the rules. Lastly, 80% responded as having a strong influence on establishing a classroom management system with each class.

The participants scored lower in the following two areas of classroom management: (a) 72% demonstrated the ability to successfully control students with behavioral issues; and (b) 64% prevented problem students from disrupting the rest of the class. An inconsistency arose with teachers scoring high levels of influence regarding making clear expectations of behavior, establishing a routine, and encouraging students to follow the rules, yet appeared less capable of properly addressing defiant behaviors.

Validating the Teacher Efficacy Instruments

The validity of the Teachers' Sense of Self-Efficacy Scale (TSES) was tested for validity in the following five settings: (a) Canada; (b) Cyprus; (c) Korea; (d) Singapore; and (e) the United States (Klassen, 2008). The purpose was to establish the importance of the teacher self-efficacy construct across diverse teaching conditions. Multi-group
confirmatory factor analysis was used to better understand the measurement invariance of the scale across countries, after which the relationship between the TSES, its three factors, and job satisfaction was explored.

The TSES showed convincing evidence of reliability and measurement invariance across the five countries, and the relationship between the TSES and job satisfaction was similar across settings. The study provides general evidence that teachers’ self-efficacy is a valid construct across culturally diverse settings and specific evidence that teachers’ self-efficacy showed a similar relationship with teachers’ job satisfaction in five contrasting settings.

Descriptive Statistics on the Multiple Intelligences Test

The researcher used the Multiple Intelligence Test developed by Chislett & Chapman (2005) to measure the variable of learning competencies. The instrument measured the strengths and potential of the participants in the subsequent areas of intelligence: (a) linguistic; (b) logical-mathematical; (c) musical; (d) bodily-kinesthetic; (e) spatial-visual; (f) interpersonal; and (g) intra-personal intelligences. There were 70 questions in all that determined the teachers’ dominant intelligences, based on the following Likert scale: (1) mostly disagree; (2) slightly disagree; (3) slightly agree; and (4) mostly agree.

Linguistic Intelligence

The domain of Gardner’s definition of linguistic intelligence derived from the following four aspects: (a) rhetorical aspect of language- the ability to use language as a means of convincing others; (b) mnemonic potential- the capacity of language as a tool for remembering information; (c) explanation- the use of language as a means of
conveying meaning in learning; and (d) meta-linguistic analysis - the potential of language as a means of a clarifying itself (Gardner, 1983, p. 78).

The respondents in the study agreed strongly to following characteristics of three out of ten questions regarding linguistic intelligence: (a) 89% found pleasure in reading; (b) 84% often talked to oneself in the head or out loud; and (c) 75% enjoyed debates.

Logical-Mathematical Intelligence

Thirdly, logical-mathematical intelligence allowed learners to (a) reason; (b) calculate; (c) conceptualize; and (c) explore patterns and their relationships in an abstract fashion. Logical-mathematical intelligence required both sides of the brain: (a) the right side of the brain dealt with concepts; and (b) the left side of the brain remember symbols (Gardner, 1983).

A person with logical-mathematical intelligence preferred dealing with abstractions and experimenting with forming concepts in carefully handled long chains of reasoning before elaborating on details. A young child’s fundamental desire to manipulate objects in one’s environment originated from the need to (a) confront the objects of the world; (b) order and reorder them; and (c) assess the quantity of those objects (Gardner, 1983).

The respondents scored strong on four of the ten questions pertaining to logical-mathematical intelligence. Ninety-four percent of the participants in the study strongly agreed to thinking carefully about problems before resolving them. Hence, it was not surprising that 88% of the same population preferred clarity instead of ambiguity and enjoyed being systematic.
Musical Intelligence

Next, musical intelligence, located in the right hemisphere of the brain, was a person's aptitude for demonstrating sensitivity to rhythms and sounds (Gardner, 1983). The composer, as Gardner described, exhibited musical precocity, which involves the consequential process of a continuous musical impulse that the composer must crystallize for the music to take its own shape (Gardner, 1983).

Music is a separate intellectual competence that is not dependent on physical objects and may be elaborated to a considerable degree by exploring the oral-aural channel. The musician's mind is primarily concerned with the mechanisms for tonal memory, while recording what is heard and submerging it into the unconscious and is subject to literal recall (Gardner, 1983).

Music intelligence was the second greatest dominant intelligence for the population sampled. Respondents scored high on six of the ten questions about music. Eighty-seven percent of the teachers enjoyed a wide variety of musical styles and placed importance on music. A great deal of the participants, 85%, also based music appeal on emotional feelings, while 81% enjoyed putting music on in the background and could identify sounds without looking. Finally, a slightly smaller percentage, 81%, felt happy while singing.

Although the participants appeared to place a great deal of value on music, music did not become an integral part of life. Only 32% of the teachers ever dreamed of becoming a singer and only 44% could actually play a musical instrument. The results revealed how the participants were more consumers of knowledge, rather than producers of it.
Bodily-Kinesthetic

Bodily-kinesthetic intelligence permitted an individual to use the body effectively through (a) movements; (b) creating objects; and (c) touching. The bodily-kinesthetic learners communicated clearly through body language and benefited from learning with hands-on objects. This type of learner preferred (a) learning through physical activity; (b) acting out; and (c) role playing (Gardner, 1983).

Gardner (1983) described bodily-kinesthetic intelligence as comprised of two core capacities: (a) control of one’s bodily motions; and (b) the capacity to handle objects skillfully. Highly skilled performers have contributed greatly to the analyses of psychologists, who have described people with bodily-kinesthetic intelligence as translating intentions into actions. These learners held the knowledge of knowing which movement came next and could do so smoothly and with expertise (Gardner, 1983).

One’s kinesthetic sense monitors the process of executing motor actions through the central nervous system, while allowing an individual to judge the (a) timing; (b) force; and (c) extent of the movements to make immediate adjustments based on spontaneous information (Gardner, 1983).

The physical operation of the bodily-kinesthetic systems, deriving from the right hemisphere of the brain, was extremely complex, involving the coordination of a variety of neural and muscular components in a highly integrated manner. Voluntary movements entailed the perpetual comparison of intended actions with the effects of the movements actually achieved. A continuous series of feedback signals between the motor and perceptual systems took place as the performance of movements was compared to the visual and linguistic image that was directing the activity (Gardner, 1983).
The teachers in the study scored the lowest in the area of bodily-kinesthetic intelligence than any other dominant intelligence by agreeing favorably to two questions out of ten. A high percentage of the teachers, 84%, were considered themselves to be tactile individuals, along with 84% of the participants felt confident about learning something new just by trying. However, the teachers strongly disagreed concerning the use of instructions for flat-pack furniture kits with only 32% favoring assembling kits hands-on without instructions.

Visual-Spatial Intelligence

Visual-spatial intelligence derived from the relationship between the learner and the physical space in the environment, thus allowing learners a keen insight into drawing and being taught through (a) drawings; (b) verbal descriptions; and (c) physical imagery. However, visual and spatial abilities are not identical; one may possess visual perception without the capacity of transforming an absent world through drawing (Gardner, 1983).

The central aspects of visual-spatial intelligence emerged as a combination of abilities that included: (a) the capacities to perceive the visual world accurately; (b) the ability to perform transformations upon one’s initial perceptions; and (c) the finesse to recreate aspects of one’s visual experience, even in the absences of the physical stimuli (Gardner, 1983).

The participants agreed with great certainty to half of the questions concerning visual-spatial intelligence: (a) 92% found graphs and charts easy to understand; (b) 86% liked drawings to help learn something new; (c) 84% could read a map easily; (d) 84% enjoyed putting pictures and photos in home; and (e) 84% could recognize previous
places from long ago. A small percentage of teachers, 40%, chose art as the favorite subject in school however.

Interpersonal Intelligence

Interpersonal intelligence, dependent on the interactions within any cultural setting, relied heavily upon the ability to (a) gather information from internal discriminations of what behaviors people might routinely make; and (b) apply the lessons learned through observations of others. This form of intelligence was an accumulation of both cultural and historical factors that regulated the more primary orders of intelligence (Gardner, 1983).

Teachers agreed strongly to the following seven of the ten questions regarding interpersonal intelligence: (a) 97% cared about the feelings of others; (b) 91% became upset from seeing someone cry and not being able to help; (c) 88% were aware of the body language of others; (d) 86% could easily tell if someone liked them or not; (e) 86% were great at solving the disputes of others; (f) 83% provided emotional support to friends; and (g) 79% were social and enjoyed other people.

Intra-Personal Intelligence

Finally, intra-personal intelligence involved a learner more timid in nature, yet one who could reach a more profound understanding of others’ (a) feelings; (b) intuition; (c) interests; (d) goals; and (e) motivation. Intra-personal learners tended to be both the most confident and independent of all the learning styles. The core capacity here was the ability to notice distinctions among other individuals in terms of (a) moods; (b) temperaments; (c) motivations; and (d) intentions. In application, the intra-personal
intelligence allowed a person to interpret the intentions and desires of others for the purpose of having a certain influence on them (Gardner, 1983).

The respondents in the study scored favorably to half of the questions regarding intra-personal intelligence. A high percentage of the teachers, 92%, could accurately predict their own behavior, while 91% enjoyed learning about themselves and spending time alone. Additionally, 86% of the teachers preferred setting goals and plans for future and 82% were closely in touch with their own feelings.

An alarming discovering was made concerning the teachers’ perceptions of their own abilities. Only 65% of the participants felt realistic about their professional and personal strengths and weaknesses. The reason for the discrepancy may be due to the negative effect that testing and educational policy shifts have had on the educators’ perceptions of being able to deliver a quality product, thus resulting with teachers second-guessing their own decisions and overall abilities in general. Once again, the demographics in the study revealed how 62% of the participants were 41 years or older. The majority of the participants were trained in an entirely different school system than the current one. Therefore, the older generation of teachers was forced to conform to new policies and to adapt to the rapid growth of technology without having the same background of younger teachers.

Perhaps the most perplexing conclusion pertaining to intra-personal intelligence was that 84% of the participants strongly disagreed to keeping a diary, which resulted as a contradiction to the previous results of intra-personal intelligence with this particular population in the study. Journaling is a self-reflective process that is often recommended, and in other cases required, of educators as a vehicle for communicating how effectively
teachers facilitate learning and reflect on teaching practices. In addition to its usefulness with the professional growth of teachers, students are often required to keep journals in various subject areas, thus resulting in the teachers’ ability to build empathy for students in the process.

The descriptive statistics on the \((n=159)\) teachers from Palm Beach County illustrated how the majority of the white female English native speakers with master’s degrees or higher were 41 years or older and either were married or had been at one point and had one or more children at the time the research was conducted. Interpersonal intelligence was the dominant intelligence of the population with bodily-kinesthetic resulting as the weakest form. The possible reasons for the participants scoring the highest in the area of interpersonal intelligence might be due to the majority of the women in this particular study had experienced the following: (a) marriage; (b) nurturing at least one child of their own; (c) applying knowledge of raising children to the classroom; and (d) teaching for six years or more.

Overall, the group of educators scored high in appreciating various art forms yet scored low in enjoying the arts in school and currently participating in the arts. The teachers showed little confidence with identifying their own strengths and weaknesses in the field and preferred not documenting those reflections in a journal. The majority of the same groups of educators would prefer instructions to putting kits together, even though a majority of the teachers describe themselves as learning new tasks by completing them.

The majority of the participants scored the highest in the areas of classroom management and the lowest in student engagement. Although the participants felt
confident about challenging the brightest students and reaching the demands of the neediest students, only a small fraction felt certain about their ability to bridge the gap between home and school.

Validating the Multiple Intelligences Test

The instrument was first pre-tested for content validity to determine if it would accurately measure what the survey was intended to test. The members of the researcher's dissertation committee reviewed the validity of each item. The internal consistency and homogeneity of the survey was tested to establish the reliability of the questionnaire in a pilot study. The internal consistency was established by SPSS as $\alpha = .686$. The items were also tested for correlations, resulting in a correlation mean ($M = .136$) (Thomas, 2006).

The researcher built index variables by combining the multiple intelligences that were predominantly left and right-brained activities in two separate groups to condense the dependent variables on the Multiple Intelligences test. The left-brain group requiring the left hemispheres of the brain included: (a) linguistic intelligence and (b) logical-mathematical intelligence. For the right brain group, the researcher included: (a) musical; (b) bodily-kinesthetic; (c) spatial-visual; (d) interpersonal; and (e) intra-personal intelligences.

Cronbach's Alpha

Cronbach's alpha is a coefficient of reliability that helped establish the internal consistency reliability of the test, while calculating how well a set of variables measure a single unidimensional latent construct (Christensen, 2001). Cronbach's Alpha returned a summary statistic that measured the internal consistency of answer patterns on a series of
related questions to show how the answers on the questionnaire related to one another.

The results of the Cronbach’s Alpha coefficients, depicted in Table 15, indicated that the subcomponents or clusters were within the acceptable range. The results yielded a strong internal consistency level with the value equaling .949.

Table 15

*Cronbach’s Alpha (α) Reliability Coefficients for the Case Processing Summary*

<table>
<thead>
<tr>
<th>Cases</th>
<th>Number of Items</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>159</td>
<td>100.0</td>
</tr>
<tr>
<td>Excludeda</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>159</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Cronbach’s Alpha (α) Reliability Statistics*

<table>
<thead>
<tr>
<th>Number of Items</th>
<th>Coefficient Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>94</td>
<td>.949</td>
</tr>
</tbody>
</table>

Research Question 1

For question one, “Will non-art teachers show stronger indicators of possessing linguistic and logical-mathematical dominant intelligences?” the researcher ran an ANOVA for data analysis to determine the relationship between teacher demographic constant variables (age, years of experience, subject area taught, educational level, and grade level) and left brain activities (logical-mathematical and linguistic intelligences).

A MANOVA was not an SPSS option at the time of data analysis, so the researcher performed an ANOVA instead to test for differences among the independent groups. The purpose of the ANOVA was to test the hypotheses to determine whether or not the means among two or more groups were equal (Christensen, 2001).
The population of the art teachers was too small to pull and provide statistical evidence, so the teachers were separated by dominant intelligences (art teachers with right-brain dominant intelligences and non-art teachers with left-brain dominant intelligences).

**Significant Findings for Research Question 1**

The art and non-art teacher populations were nonequivalent in size, resulting with only 13% of the total number of participants in the study working as art teachers. Therefore, the researcher chose to divide the participants in two groups based on brain hemispheres. The art teacher group became the right-brain hemisphere dominant group and the non-art teachers changed to the predominant left-brain hemisphere group.

There was a significant finding concerning left-brain dominant intelligences (representing the non-art teachers) and logical-mathematical intelligences $F(5, 153) p < .001$. The results confirmed the hypothesis that non-art teachers (left-brain dominance) revealed stronger levels of logical-mathematical intelligence, which was a left-brain dominant intelligence (see Table 16). The non-art teachers did not, however, reveal a significant finding in the left-brain intelligence of linguistic intelligence $F(5,153) p > .05$.

Consequently, non-art teachers (left-brain dominance) did not result in a significant finding in the following right-brain dominant intelligences: (a) bodily-kinesthetic $F(5, 153) p > .05$; (c) spatial-visual $F(5,153) p > .05$; (d) interpersonal $F(5, 153) p > .05$; and (e) intra-personal intelligences $F(5, 153) p > .05$. Musical intelligence, however, did reveal a significant finding for non-art teachers at $F(5,153) p > .05$.
Table 16

*One-Way ANOVA of Left-Brain Dominant Intelligences of Non-Art Teachers*

<table>
<thead>
<tr>
<th>Intelligences</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic Intelligence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>5.516</td>
<td>5</td>
<td>1.103</td>
<td>2.143</td>
<td>.063</td>
</tr>
<tr>
<td>Within Groups</td>
<td>78.757</td>
<td>153</td>
<td>.515</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>84.273</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logical/Mathematical Intelligence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>11.706</td>
<td>5</td>
<td>2.341</td>
<td>5.255*</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>68.165</td>
<td>153</td>
<td>.446</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>79.871</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Musical Intelligence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>10.332</td>
<td>5</td>
<td>2.066</td>
<td>3.717*</td>
<td>.003</td>
</tr>
<tr>
<td>Within Groups</td>
<td>85.058</td>
<td>153</td>
<td>.556</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>95.391</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bodily/Kinesthetic Intelligence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>2.383</td>
<td>5</td>
<td>.477</td>
<td>.693</td>
<td>.629</td>
</tr>
<tr>
<td>Within Groups</td>
<td>105.187</td>
<td>153</td>
<td>.687</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>107.571</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spatial-Visual Intelligence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>3.378</td>
<td>5</td>
<td>.676</td>
<td>1.336</td>
<td>.252</td>
</tr>
<tr>
<td>Within Groups</td>
<td>77.392</td>
<td>153</td>
<td>.506</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>80.770</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal Intelligence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>1.441</td>
<td>5</td>
<td>.288</td>
<td>.590</td>
<td>.707</td>
</tr>
<tr>
<td>Within Groups</td>
<td>74.730</td>
<td>153</td>
<td>.488</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>76.171</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intrapersonal Intelligence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>1.471</td>
<td>5</td>
<td>.294</td>
<td>.649</td>
<td>.663</td>
</tr>
<tr>
<td>Within Groups</td>
<td>69.373</td>
<td>153</td>
<td>.453</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>70.844</td>
<td>158</td>
<td></td>
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</tr>
</tbody>
</table>

91 cells (91.9%) have expected count less than 5. The minimum expected count is .000. *** < .001 ** < .01
Research Question 2

For question two, “Will art teachers’ learning competencies demonstrate higher degrees of musical, bodily-kinesthetic, spatial-visual, interpersonal, and intra-personal intelligences?” the researcher used an ANOVA for data analysis to determine the relationship between right-brain dominant intelligences and subject area taught.

Significant Findings for Research Question 2

There was a significant finding concerning art teachers (right-brain dominance) and right-brain dominant intelligence, which was musical intelligence F (5, 153) p > .01 (see Table 3).

However, there were no significant results in the following areas: (a) bodily-kinesthetic intelligence F (5, 153) p > .05; (b) spatial-visual intelligence F (5, 153) p > .05; (c) interpersonal intelligence F (5, 153) p > .05; and (d) intra-personal intelligence F (5, 153) p > .05 (see Table 17).

The results to research question 2 indicated that the right-brain dominant teachers from this particular convenience sample revealed greater levels of the right-brain intelligence of musical intelligence.
Table 17

One-Way ANOVA of Right-Brain Dominant Intelligences of Art Teachers

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Musical Intelligence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>10.332</td>
<td>5</td>
<td>2.066</td>
<td>3.717**</td>
<td>.003</td>
</tr>
<tr>
<td>Within Groups</td>
<td>85.058</td>
<td>153</td>
<td>.556</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>95.391</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bodily/Kinesthetic Intelligence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>2.383</td>
<td>5</td>
<td>.477</td>
<td>.693</td>
<td>.629</td>
</tr>
<tr>
<td>Within Groups</td>
<td>105.187</td>
<td>153</td>
<td>.687</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>107.571</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spatial-Visual Intelligence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>3.378</td>
<td>5</td>
<td>.676</td>
<td>1.336</td>
<td>.252</td>
</tr>
<tr>
<td>Within Groups</td>
<td>77.392</td>
<td>153</td>
<td>.506</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>80.770</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interpersonal Intelligence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>1.441</td>
<td>5</td>
<td>.288</td>
<td>.590</td>
<td>.707</td>
</tr>
<tr>
<td>Within Groups</td>
<td>74.730</td>
<td>153</td>
<td>.488</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>76.171</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intra-personal Intelligence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>1.471</td>
<td>5</td>
<td>.294</td>
<td>.649</td>
<td>.663</td>
</tr>
<tr>
<td>Within Groups</td>
<td>69.373</td>
<td>153</td>
<td>.453</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>70.844</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 91 cells (91.9%) have expected count less than 5. The minimum expected count is .003. **< .01

Research Question 3

For question three, “Which type of learning competency will have the greatest predictive value on high levels of teacher efficacy?” the researcher used the Multiple Regression Model for data analysis. The model helped determine the predictive value of the Multiple Intelligences on the levels of teacher efficacy in the areas of: (a) student engagement; (b) instructional practices; and (c) classroom management.
Multiple Regression Model for Research Question 3

First, the researcher performed a correlation matrix to determine which variables were acceptable candidates for regression modeling to determine which relationships were statistically significant. A multiple regression model was chosen to accommodate the independent variables (linguistic, logical-mathematical, musical, bodily-kinesthetic, spatial-visual, interpersonal, and intrapersonal) that were trying to predict the variability in a single dependent variable (student engagement, classroom management, and instructional strategies).

Significant Findings for Research Question 3

Pearson’s Chi-Square Test for Research Question 3

Pearson’s Chi-Square test was used to assess two types of comparisons to determine whether or not an observed frequency distribution differed from a theoretical distribution. The Chi-Square Test provided a sensitive reading on categorical relationships with nominal or ordinal data. The Chi-Square statistic was calculated by finding the difference between each observed and theoretical frequency for each possible outcome, squaring them, dividing each by the theoretical frequency, and taking the sum of the results. The degree of freedom was the number of observed frequencies defined as theoretical frequencies (Christensen, 2001). A Chi-Square test was used to ascertain whether or not there was significance between the independent variable of familial status and the dependent variables of student engagement and classroom management.

The results of the Chi-Square test revealed a linear-by-linear association of $p < .05)$, which resulted in a significant finding. The $R^2$ square was the amount of variation in the
dependent variable that was predicted by the independent variables, resulting in $R^2 = .01$, which was the strongest variable in terms of statistical significance. The researcher will recommend again that future research with a larger sample size be conducted in the future.

The Chi-Square Test results revealed that the independent variable of familial status had a linear-by-linear association with both the dependent variables of (a) student engagement and (b) classroom management (see Table 18).

Table 18

*Chi-Square Test of Familial Status and Student Engagement and Classroom Management*

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>65.870a</td>
<td>64</td>
<td>.412</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>63.236</td>
<td>64</td>
<td>.503</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>4.166*</td>
<td>1</td>
<td>.041</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>159</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 91 cells (91.9%) have expected count less than 5. The minimum expected count is .04. *<.05

Multiple Regression Models

The regression models yielding significant findings were in the independent variable (familial status) and the dependent variable (student engagement), $b = .16$, $t(159) = 2.47$, $p < .05$ (see Table 19). The smaller the significance value, the less likely the effect was due to random chance. The results suggested that teachers with a larger
number of their own children felt much more capable of achieving high levels of student engagement in their classrooms.

Table 19

*Multiple Regression Model for Familial Status and Student Engagement*

<table>
<thead>
<tr>
<th>Explanatory Variable</th>
<th>$b$</th>
<th>SE</th>
<th>$t$</th>
<th>BETA ($\beta$)</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>2.81</td>
<td>.154</td>
<td>18.26***</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>Familial Status</td>
<td>.16</td>
<td>.066</td>
<td>2.47*</td>
<td>.13</td>
<td>.02</td>
</tr>
<tr>
<td>Marital Status</td>
<td>.01</td>
<td>.053</td>
<td>.25</td>
<td>.02</td>
<td>.80</td>
</tr>
</tbody>
</table>

91 cells (91.9%) have expected count less than 5. The minimum expected count is .000. *** < .001 * < .05

Next, the researcher performed another regression model on the independent variable (familial status) and the dependent variable (classroom management), $b = .137$, $t (159) = 2.1$, $p < .05$ (see Table 20). The results revealed a significant finding in the positive relationship between teachers who had children and the ability to effectively manage the classroom. The number of children the teachers had appeared to be a positive predictor for both student engagement and classroom management.
### Table 20

**Multiple Regression Model for Familial Status and Classroom Management**

<table>
<thead>
<tr>
<th>Explanatory Variable</th>
<th>$b$</th>
<th>SE</th>
<th>$t$</th>
<th>BETA ($\beta$)</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>3.33</td>
<td>.152</td>
<td>21.98***</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Familial Status</td>
<td>.137</td>
<td>.065</td>
<td>2.09*</td>
<td>.17</td>
<td>.038</td>
</tr>
<tr>
<td>Marital Status</td>
<td>.014</td>
<td>.052</td>
<td>.27</td>
<td>.02</td>
<td>.785</td>
</tr>
</tbody>
</table>

*a. 91 cells (91.9%) have expected count less than 5. The minimum expected count is .000. ***< .001  *< .05*

### One-Way ANOVAS for Research Question 3

A one-way ANOVA was performed to determine a possible relationship between logical-mathematical intelligence and subject areas taught. The results showed a significant finding in logical-mathematical intelligence and subject areas taught ($F = 5.26, p < .001$) (see Table 21).

### Table 21

**ANOVA Tests of Between-Subjects Effects in Logical-Mathematical Intelligence and Subject Areas Taught**

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical-Mathematical Intelligence Between Groups</td>
<td>11.71</td>
<td>5</td>
<td>2.34</td>
<td>5.26***</td>
</tr>
<tr>
<td>Logical-Mathematical Intelligence Within Groups</td>
<td>68.17</td>
<td>153</td>
<td>.45</td>
<td></td>
</tr>
<tr>
<td>Logical-Mathematical Intelligence Total</td>
<td>79.87</td>
<td>158</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a. 91 cells (91.9%) have expected count less than 5. The minimum expected count is .000. ***< .001*
An additional one-way ANOVA was run to establish a possible significance between musical intelligence and subject areas taught. The results showed a significant finding $F(5,153) p < .01$ between teachers with musical intelligence as a dominant intelligence and the certain subjects taught by those teachers (see Table 22). Again, the ANOVA could not determine which subject areas were taught by teachers with dominant musical intelligence. The ANOVA, however, could not explain the location of the significance in terms of teachers’ subject areas.

Table 22

Tests of Between-Subjects Effects in Musical Intelligence and Subject Areas Taught

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Musical Between Groups</td>
<td>10.33</td>
<td>5</td>
<td>2.07</td>
<td>3.72**</td>
</tr>
<tr>
<td>Musical Within Groups</td>
<td>85.06</td>
<td>153</td>
<td>.56</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>95.39</td>
<td>158</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 91 cells (91.9%) have expected count less than 5. The minimum expected count is .003. **< .01

An additional one-way ANOVA was run to establish a possible significance between grade level and the three areas of teacher efficacy: (a) student engagement; (b) instructional strategies; and (c) classroom management (see Table 23). The results demonstrated a significant finding with the following: (a) student engagement $F(2,156) p < .01$; (b) instructional strategies $F(2,156) p < .05$; and (c) classroom management $F(2,156) p < .05$. 

221
### Table 23

**Tests of Between-Subjects Effects of Grade Level and Areas of Teacher Efficacy**

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student Engagement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>9.35</td>
<td>2</td>
<td>4.67</td>
<td>5.90**</td>
<td>.003</td>
</tr>
<tr>
<td>Within Groups</td>
<td>123.54</td>
<td>156</td>
<td>.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>132.89</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Instructional Strategies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>7.15</td>
<td>2</td>
<td>3.57</td>
<td>4.55**</td>
<td>.012</td>
</tr>
<tr>
<td>Within Groups</td>
<td>122.53</td>
<td>156</td>
<td>.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>129.68</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Classroom Management</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>8.971</td>
<td>2</td>
<td>4.49</td>
<td>5.87**</td>
<td>.003</td>
</tr>
<tr>
<td>Within Groups</td>
<td>119.13</td>
<td>156</td>
<td>.764</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>128.10</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 91 cells (91.9%) have expected count less than 5. The minimum expected count is .003. **< .01

An additional one-way ANOVA was run to establish a possible significance between left-brain intelligences and classroom management. The results demonstrated a significant finding in left-brain intelligences and classroom management.

\[ F(44, 114) = .05 \] (see Table 24).
Table 24

Tests of Between-Subjects Effects of Left-Brain Intelligences on Classroom Management

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom Management</td>
<td>46.93</td>
<td>44</td>
<td>1.067</td>
<td>1.50</td>
<td>.05</td>
</tr>
<tr>
<td>Within Groups</td>
<td>81.17</td>
<td>114</td>
<td>.712</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>128.10</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 91 cells (91.9%) have expected count less than 5. The minimum expected count is .05. *< .05

In order to determine if a relationship existed between right-brain intelligences and classroom management, a one-way ANOVA test was performed. The results (see Table 25) also demonstrated a significant finding between teachers with right-brain dominant intelligences and classroom management $F(80, 78) p < .01$.

Table 25

Tests of Between-Subjects Effects of Right-Brain Intelligences on Classroom Management

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom Management</td>
<td>81.61</td>
<td>80</td>
<td>1.02</td>
<td>1.71</td>
<td>.009</td>
</tr>
<tr>
<td>Within Groups</td>
<td>46.49</td>
<td>78</td>
<td>.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>128.10</td>
<td>158</td>
<td></td>
<td>1.20</td>
<td>.206</td>
</tr>
</tbody>
</table>

a. 91 cells (91.9%) have expected count less than 5. The minimum expected count is .009. **< .01

The independent variable of grade level taught also showed significance ($p < .05$) on the dependent variable student engagement (see Table 26). However, the results for
the Levene’s Test did not specify which grade level (primary or secondary) had a greater impact on student engagement $F(151, 149) p < .01$. The researcher would perform t tests to examine which grade level taught (primary or secondary) had a greater impact on student engagement.

Table 26

*Levene’s Test for Equality of Variances Test Results of Student Engagement and Grade Level Taught*

<table>
<thead>
<tr>
<th></th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>Student Engagement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances</td>
<td>1.507</td>
<td>.222</td>
</tr>
<tr>
<td>Equal variances</td>
<td>3.273</td>
<td>149.459</td>
</tr>
</tbody>
</table>
| a. 91 cells (91.9%) have expected count less than 5. The minimum expected count is .001. ***$p < .01$.

Two-Tailed T Tests for Research Question 3

Hence, the researcher ran a two-tailed t test to conclude the significance level between grade level taught: (a) primary (grades K-5); or (b) secondary (grades 6-12) and the degree of student engagement. The influence primary teachers had on student engagement was a significant finding ($M = 3.3$, $SD = .81$), while for secondary teachers resulted less significant ($M = 2.8$, $SD = .96$) (see Table 26).

The two tailed t test results in Table 27 indicated that the art teachers ($M = 3.55$) possessed a higher degree of musical intelligence than the English and writing teachers.
(M = 2.87), resulting in t (77) = -5.75, p < .001. Furthermore, the art teachers (M = 3.55) showed stronger musical intelligence than the ESE and ESOL teachers (M = 2.69), resulting in t (67) = 4.97, p < .001. Moreover, the art teachers (M = 3.55) possessed a higher degree of musical intelligence than teachers teaching all other subject areas (M=3.16), resulting in t (84) = 2.93, p < .01.

The participants who taught all other subject areas (M = 3.16) demonstrated a higher level of musical intelligence than the English and writing teachers (M = 2.87), resulting in t (54) = -2.52, p < .05. Similarly, the teachers teaching all other subject areas (M = 3.16), demonstrated greater musical intelligence than ESE and ESOL teachers (M = 2.69), resulting in t (67) = -3.01, p < .01.

Table 27

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 1 Mean 1</th>
<th>Group 2 Mean 2</th>
<th>t-value</th>
<th>sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>English and Writing</td>
<td>The Arts</td>
<td>2.87</td>
<td>3.55</td>
<td>-5.75***</td>
<td>.000</td>
</tr>
<tr>
<td>English and Writing</td>
<td>Other</td>
<td>2.87</td>
<td>3.16</td>
<td>-2.52*</td>
<td>.014</td>
</tr>
<tr>
<td>The Arts</td>
<td>ESE &amp; ESOL</td>
<td>3.55</td>
<td>2.69</td>
<td>4.97***</td>
<td>.000</td>
</tr>
<tr>
<td>The Arts</td>
<td>Other</td>
<td>3.55</td>
<td>3.16</td>
<td>2.93**</td>
<td>.005</td>
</tr>
<tr>
<td>ESE &amp; ESOL</td>
<td>Other</td>
<td>2.69</td>
<td>3.16</td>
<td>-3.01**</td>
<td>.004</td>
</tr>
</tbody>
</table>

a. 91 cells (91.9%) have expected count less than 5. The minimum expected count is .000. *** < .001 ** < .01

Additional ANOVAS for Research Question 3

Three more ANOVAS were run to answer whether the dominant intelligences of teachers could predict teacher efficacy. The first ANOVA yielded no significant findings in the relationship between multiple intelligences and teacher efficacy in the subsequent
areas: (a) student engagement $F(5, 153) p > .05$; (b) instructional strategies $F(5, 153) p > .05$; and (c) classroom management $F(5, 153) p > .05$ (see Table 28).

Table 28

ANOVA of Teacher Efficacy and Between and Within Group Differences

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student Engagement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>7.417</td>
<td>5</td>
<td>1.483</td>
<td>1.809</td>
<td>.114</td>
</tr>
<tr>
<td>Within Groups</td>
<td>125.468</td>
<td>153</td>
<td>.820</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>132.885</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Instructional Strategies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>7.083</td>
<td>5</td>
<td>1.417</td>
<td>1.768</td>
<td>.123</td>
</tr>
<tr>
<td>Within Groups</td>
<td>122.590</td>
<td>153</td>
<td>.801</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>129.673</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Classroom Management</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>4.438</td>
<td>5</td>
<td>.888</td>
<td>1.098</td>
<td>.364</td>
</tr>
<tr>
<td>Within Groups</td>
<td>123.660</td>
<td>153</td>
<td>.808</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>128.098</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 91 cells (91.9%) have expected count less than 5. The minimum expected count is .114. * > .05

The results of the two ANOVAS testing the relationship between left and right-brain dominant intelligences and classroom management showed how both hemispheres of the brain impacted classroom management. Therefore, the researcher ran further tests to determine the direction of that significance level.

The results of the Correlation Matrix revealed how right-brain dominance was correlated with student engagement ($r = .171, p < .05$) and instructional strategies ($r = .171, p < .05$). Right-brain dominance did not appear to correlate with classroom management.

Left-brain dominance did not appear to correlate with student engagement and instructional strategies. Left-brain dominance did, however, correlate with classroom management ($r = .186, p < .05$) (see Table 29).
Table 29

*Correlation Matrix of Right and Left-Brain Tendency by Teacher Efficacy Measures*

<table>
<thead>
<tr>
<th></th>
<th>Student Engagement</th>
<th>Classroom Management</th>
<th>Instructional Strategies</th>
<th>Right Brain Activities</th>
<th>Left Brain Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student Engagement</strong></td>
<td>Pearson</td>
<td>.664**</td>
<td>.566**</td>
<td>.171*</td>
<td>.138</td>
</tr>
<tr>
<td>Correlation</td>
<td></td>
<td>.000</td>
<td>.000</td>
<td>.031</td>
<td>.082</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>159</td>
<td>159</td>
<td>159</td>
<td>159</td>
<td>159</td>
</tr>
<tr>
<td><strong>Classroom Management</strong></td>
<td>Pearson</td>
<td>.664**</td>
<td>.712**</td>
<td>.170*</td>
<td>.186*</td>
</tr>
<tr>
<td>Correlation</td>
<td></td>
<td>.000</td>
<td>.000</td>
<td>.032</td>
<td>.019</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>159</td>
<td>159</td>
<td>159</td>
<td>159</td>
<td>159</td>
</tr>
<tr>
<td><strong>Instructional Strategies</strong></td>
<td>Pearson</td>
<td>.566**</td>
<td>.712**</td>
<td>.126</td>
<td>.117</td>
</tr>
<tr>
<td>Correlation</td>
<td></td>
<td>.000</td>
<td>.000</td>
<td>.112</td>
<td>.141</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>159</td>
<td>159</td>
<td>159</td>
<td>159</td>
<td>159</td>
</tr>
<tr>
<td><strong>Right Brain Activities</strong></td>
<td>Pearson</td>
<td>.171*</td>
<td>.170*</td>
<td>.126</td>
<td>.780**</td>
</tr>
<tr>
<td>Correlation</td>
<td></td>
<td>.031</td>
<td>.032</td>
<td>.112</td>
<td>.000</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>159</td>
<td>159</td>
<td>159</td>
<td>159</td>
<td>159</td>
</tr>
<tr>
<td><strong>Left Brain Activities</strong></td>
<td>Pearson</td>
<td>.138</td>
<td>.186*</td>
<td>.117</td>
<td>.780**</td>
</tr>
<tr>
<td>Correlation</td>
<td></td>
<td>.082</td>
<td>.019</td>
<td>.141</td>
<td>.000</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>159</td>
<td>159</td>
<td>159</td>
<td>159</td>
<td>159</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).
Additional T Test Results

The researcher ran a two-tailed t test to determine the direction of the significance level that logical-mathematical intelligence had on the different subject areas taught (see Table 21). The outcome of the diagnostic t tests, which illuminated the significant group-to-group comparisons from the larger ANOVA tests, was the full output result from SPSS.

The results (see Table 16) revealed how math and science teachers (M = 3.64) revealed a higher level of logical-mathematical intelligence than English teachers (M = 2.92) with the results of t (77) = -3.22, p < .01. Math and science teachers (M = 3.64) had a higher degree of logical-mathematical intelligence than that of art teachers (M = 2.96) resulting in t (52) = 2.47, p < .05. Likewise, math and science teachers (M = 3.64) also showed higher levels of logical-mathematical intelligence than the ESE (Exceptional Student Education) and ESOL (English As A Second Language) teachers (M = 2.90), creating significance with t (54) = 2.92, p < .01. Moreover, math and science teachers (M = 3.64) showed higher degree of logical-mathematical intelligence than teachers who taught other all other subject areas (M = 3.17) teachers with t (67) = 2.20, p < .05.

Furthermore, teachers who taught other all other subject areas (M = 3.17) showed a stronger level of logical-mathematical intelligence than English teachers (M = 2.92) with the results of t (77) = -2.37, p < .05. Finally, teachers of all other subject areas (M = 3.17) also surpassed the logical-mathematical intelligence of ESE and ESOL teachers (M = 2.90) with t (61) = -2.08, p < .05 (see Table 30).
Table 30

*T Test Results for Logical-Mathematical Intelligence and Subject Areas Taught*

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
<th>Mean 1</th>
<th>Mean 2</th>
<th>t-value</th>
<th>sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>English, etc.</td>
<td>Math &amp; Science</td>
<td>2.92</td>
<td>3.64</td>
<td>-3.22**</td>
<td>.003</td>
</tr>
<tr>
<td>English, etc.</td>
<td>Other</td>
<td>2.92</td>
<td>3.17</td>
<td>-2.37*</td>
<td>.020</td>
</tr>
<tr>
<td>Math &amp; Science</td>
<td>The Arts</td>
<td>3.64</td>
<td>2.96</td>
<td>2.47*</td>
<td>.017</td>
</tr>
<tr>
<td>Math &amp; Science</td>
<td>ESE &amp; ESOL</td>
<td>3.64</td>
<td>2.90</td>
<td>2.92**</td>
<td>.005</td>
</tr>
<tr>
<td>Math &amp; Science</td>
<td>Other</td>
<td>3.64</td>
<td>3.17</td>
<td>2.20*</td>
<td>.032</td>
</tr>
<tr>
<td>ESE &amp; ESOL</td>
<td>Other</td>
<td>2.90</td>
<td>3.17</td>
<td>-2.08*</td>
<td>.0429</td>
</tr>
</tbody>
</table>

a. 91 cells (91.9%) have expected count less than 5. The minimum expected count is .003. **< .01

**Implications for Results**

The first hypothesis concerning whether non-arts teachers (left-brain dominance) would show stronger indicators of possessing linguistic and logical-mathematical dominant intelligences was tested with a one-way ANOVA (see Table 16). A considerable finding was found in logical-mathematical intelligence $F (5, 153) p < .01$.

Musical intelligence also resulted as noteworthy with $F (5, 153) p < .01$ (see Table 16).

In order for the researcher to determine the direction of the significance in subject areas taught and the multiple intelligences, $t$ tests were run to explore the relationship between left- and right-brain dominant intelligences.

Math and science teachers ($M = 3.64$) had a higher degree of logical-mathematical intelligence than that of art teachers ($M = 2.96$), resulting in $t (50) = 2.47, p < .05$. Math and science teachers ($M = 3.64$) also showed higher levels of logical-mathematical intelligence than the ESE (Exceptional Student Education) and ESOL (English as A Second Language) teachers ($M = 2.90$), resulting in $t = 2.92, p < .05$. 

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Finally, the math and science teachers (M = 3.64) surpassed all other subject areas taught (M = 3.17), resulting in t = 2.20, p < .05. (see Table 30).

Furthermore, teachers who taught other all other subject areas (M = 3.17) showed a stronger level of logical-mathematical intelligence than English teachers (M = 2.92) with the results of t = -2.37, p < .05. Teachers of all other subject areas (M = 3.17) also surpassed the logical-mathematical intelligence of ESE and ESOL teachers (M = 2.90) with t = -2.08, p < .05 (see Table 30).

The second hypothesis regarding whether or not the dominant intelligences of art teachers (right-brain dominance) would reveal higher degrees of musical, bodily-kinesthetic, spatial-visual, interpersonal, and intra-personal intelligences was tested with an ANOVA was answered by examining the subject area of a teacher through either the left- or brain-brain dominant hemispheres of the brain.

The results of the one-way ANOVA established a significant finding in musical intelligence on a dominant hemisphere of the brain. The researcher, therefore, chose to run a two-tailed t test to help determine in which direction the significance rested. Unlike in the ANOVA, the t test examined the dominant intelligence of all the specific subject areas taught.

The two-tailed t test results indicated that the art teachers (M = 3.55) possessed a higher degree of musical intelligence than the ESE and ESOL teachers (M = 2.69) with t = 4.97, p < .001). The art teachers (M = 3.55) also revealed higher levels of musical intelligence than the teachers teaching all other subject areas (M = 3.16), resulting in with t = 2.93, p < .05 (see Table 27).
The third hypothesis sought to establish if the dominant intelligences of art teachers (right-brain dominance) would indicate higher levels of teacher efficacy in the areas of: (a) student engagement; (b) instructional practices; and (c) classroom management.

The results of the Correlation Matrix revealed how right-brain dominance was correlated with student engagement ($r = .171$, $p < .05$) and instructional strategies ($r = .171$, $p < .05$). Right-brain dominance did not appear to correlate with classroom management (see Table 15).

Left-brain dominance did not appear to correlate with student engagement and instructional strategies. Left-brain dominance did, however, correlate with classroom management ($r = .186$, $p < .05$) (see Table 29).

The Relationship between Teacher Demographics and Teacher Efficacy

The researcher explored an area outside of the original three research questions to determine whether teacher demographics influenced the multiple intelligences and teacher efficacy. The results could help establish a broader foundation for future research involving demographics and their influences on both dominant intelligences and teacher efficacy.

The researcher chose a regression model, which indicated that the number of children the teachers had appeared to be a positive predictor for both student engagement and classroom management.

Finally, the Levene’s Test measured the influence primary and secondary teachers had on student engagement resulted in for primary and for secondary teachers (see Table 26). The results indicated that primary teachers (from kindergarten to grade 5) were
more effective at engaging students in learning than the secondary teachers (from grades 6 to 12). The researcher ran an ANOVA for data analysis to determine the relationship between the teacher demographic constant variables: (a) age; (b) years of experience; (c) subject area taught; (d) educational level; (e) and grade level and (a) left-brain intelligence (logical-mathematical) and (b) right-brain intelligence (musical intelligence).

The research concluded two surprising findings based on the teacher demographics profile survey. First, the Chi-Square test discovered a finding between the independent variable of familial status and the dependent variables of student engagement and classroom management with a linear-by-linear association of ($p < .05$) (see Table 18).

The multiple regression model further explored the relationship of the independent variable (familial status) on the dependent variable (student engagement), $b = .16$, $t (n) = 2.47$, $p < .05$ (see Table 5). The results supported the notion that teachers with their own children felt much more confident at achieving high levels of student engagement. Another regression model was run on the independent variable (familial status) and the dependent variable (classroom management), $b = .137$, $t (n) = 2.1$, $p < .05$ (see Table 4). The results discovered a significant finding in the relationship between teachers who had children and the effectively managing classrooms. Both regression models showed that the number of children the teachers had appeared to be a positive predictor for both (a) student engagement and (b) classroom management.

The first one-way ANOVA was used to determine a relationship between logical-mathematical intelligence and subject areas taught, which resulted in a significant finding ($F = 5.26$, $p < .001$) (see Table 21). An additional one-way ANOVA resulted in a
significant finding $F(5,153) p < .01$ (see Table 22) between musical intelligence and subject areas taught. The third one-way ANOVA (see Table 9) demonstrated a significant discovery in all three areas: (a) student engagement $F(2,156) p < .01$; (b) instructional strategies $F(2,156) p < .05$; and (c) classroom management $F(2,156) p < .05$.

The next one-way ANOVA revealed a significant result in left-brain intelligences and classroom management with $F(44, 114) = .05$ (see Table 24). Finally, the last one-way ANOVA test (see Table 11) showed a significant finding between teachers with right-brain dominant intelligences and classroom management $F(80, 78) p < .01$.

The results for the Levene’s Test showed a connection between grade level taught (primary or secondary) and student engagement $F(151, 149) p < .01$. Therefore, the researcher ran a two-tailed t test to conclude the significance level between grade levels taught, with primary teachers having a stronger impact on student engagement (see Table 26).

The two tailed t test in Table 13 indicated that the art teachers possessed a higher degree of musical intelligence than the English and writing teachers resulting in $t(57) = -5.75, p < .001$. Furthermore, the art teachers showed stronger musical intelligence than the ESE and ESOL teachers, resulting in $t(54) = 4.97, p < .001$. Additionally, the art teachers possessed a higher degree of musical intelligence than teachers teaching all other subject areas, resulting in $t(57) = 2.93, p < .01$.

The researcher also explored the relationship between left and right-brain dominant intelligences and the three areas of teacher efficacy. The results of the Correlation Matrix revealed how right-brain dominance was correlated with student
engagement ($r = .171$, $p < .05$) and instructional strategies ($r = .171$, $p < .05$) (see Table 29).

Left-brain dominance did not appear to correlate with student engagement and instructional strategies. Left-brain dominance did, however, correlate with classroom management ($r = .186$, $p < .05$) (see Table 29).

The results of the research study confirmed the hypothesis of the first research question that non-art teachers (left-brain dominance) revealed stronger levels of logical-mathematical intelligence, which was a left-brain dominant intelligence. Non-art teachers (left-brain dominance) did not result in a significant finding in any of the right-brain dominant intelligences. The non-art teachers did not, however, reveal a significant finding in the other area of left-brain intelligence, which was linguistic intelligence.

The researcher ran a two-tailed $t$ test to determine the direction of the significance level that logical-mathematical intelligence had on the different subject areas taught. The results revealed how math and science teachers revealed a higher level of logical-mathematical intelligence than (a) English teachers; (b) art teachers; (c) ESE (Exceptional Student Education) and ESOL (English As A Second Language); and teachers who taught other all other subject areas.

The research study also confirmed the hypothesis of the second research question that art teachers (right-brain dominance) revealed stronger levels of musical intelligence, which was a right-brain dominant intelligence. Art teachers (right-brain dominance) did not result in a significant finding in the other following areas of right-brain dominant intelligences: (a) bodily-kinesthetic intelligence; (b) spatial-visual intelligence; (c) interpersonal intelligence; and (d) intra-personal intelligence.
The two-tailed t test results indicated that the art teachers possessed a higher degree of musical intelligence than (a) English teachers; (b) ESE and ESOL teachers; and (c) teachers teaching all other subject areas.

The researcher chose to explore whether the teacher demographic independent variables of familial status and grade level would impact the areas of teacher efficacy. A surprising result in the area of teacher demographics arose from the Chi-Square Test, with a linear-by-linear association between the independent variable of familial status and the dependent variables of teacher efficacy: (a) student engagement and (b) classroom management.

The regression model measured familial status and the dependent variable of student engagement. The results suggested that teachers with a larger number of their own children felt much more capable of achieving high levels of student engagement in their classrooms. The other regression model revealed a significant finding in the positive relationship between teachers who had children and the ability to effectively manage the classroom.

The results of the Levene’s Test showed that the independent variable of grade level taught had influence on the dependent variable of student engagement. The t tests revealed that primary teachers had a greater impact on student engagement than secondary.

The results of the research study did not confirm the hypothesis of the third research question concerning which individual multiple intelligences would have the greatest influence on teacher efficacy. However, when the researcher grouped left-brain dominant intelligences together in one group and right-brain dominant intelligences in
another group, the results of the Correlation Matrix revealed how right-brain dominance was correlated with (a) student engagement and (b) instructional strategies. Left-brain dominance, conversely, did not correlate with (a) student engagement and (b) instructional strategies. The results, however, showed that left-brain influenced classroom management (see Table 29).
The purpose of this non-experimental causal-comparative study was to determine whether the subject areas educators taught determined a pattern of learning competencies among non-arts and art teachers, as measured by the Multiple Intelligences Test (Chislet & Chapman, 2005).

The theory of multiple intelligences searched for an alternative perspective on human intelligence and was derived from a synthesis of: (a) information concerning human beings; (b) knowledge of the human brain; (c) findings from special populations of people form autistics to prodigies; and (d) the identification of capabilities that are valued in cultures completely unlike that of the United States (Gardner, 1977).

Gardner proposed that human beings had evolved as a species into exhibiting eight diverse forms of intelligence: (a) linguistic and logical-mathematical (considered the most valuable on exams and in schools); (b) visual-spatial; (c) musical; (d) bodily-kinesthetic; (e) interpersonal; (f) intra-personal intelligences; and (g) the appreciation of the natural world (Gardner, 1977).

The result of Gardner’s analyses at Harvard’s Project Zero attributed to identifying four forms of “symptomatic” symbols of artistic symbolization: (a) transference of mood found in expression; (b) awareness to fine details or style; (c) array of elements with their effects on each other and on the composition; and (d) communication of various meanings (Gardner, 1989). An artistic education offered students the opportunity to develop the facility to read imaginative representations found
in compositions, while being able to write or produce artistic icons in a range of meaningful ways (Gardner, 1989).

This study also sought to establish if there was a possible relationship between certain dominant intelligences (multiple intelligences) and the results of teachers’ perceptions of teacher efficacy, as measured by the Teachers’ Sense of Efficacy Scale Test (Tschannen-Moran & Hoy, 2001). The ultimate goal of this study was to resolve which dominant intelligences had the most profound impact on teacher efficacy in the areas of (a) student engagement; (b) instructional practices; and (c) classroom management.

Teacher Efficacy was founded on the social learning theory of personality (Rotter, 1972), which was the premier theory on social learning. The theory argued that cognition in expectation form resulted as a critical factor in social learning. Behavior was determined by two major types of expectancies: (a) the expected outcome of a behavior and (b) the value a person put on that outcome. The general theory of personality was determined by the ways that different individuals continually reflected upon their own experiences (Rotter, 1972).

According to the social learning theory of personality, individuals regarded themselves as either: (a) "internals," who considered themselves as controlling events and (b) "externals," who viewed events as outside of their control. Correlations were found between “internal” orientations and an array of behaviors, from job performance to attitudes toward one’s health (Rotter, 1972).

The term self-efficacy (Bandura, 1977) signified that a high degree of influence, along with expectations, influenced one’s own performance. The social learning theories
of Bandura (1977) emphasized the reciprocal relationship among (a) cognition; (b) behavior; and (c) environment. One’s environment, according to Bandura, influenced one’s thoughts and behavior and played a significant role in determining our environment. Bandura also expanded on Rotter’s notion of expectancy by arguing that one’s expectations of the outcome of situations were greatly influenced by whether or not one thought there would be success at the tasks attempted.

This study investigated the relationship between the learning competencies of art and non-arts teachers. In addition, the project explored the predictive value of the dominant intelligences of educators and whether or not teacher demographics influenced levels of teacher efficacy. The primary investigator used a convenience sample to attain a target population that consisted of K-12 educators who taught either art or non-arts subject areas in Palm Beach County.

The researcher hypothesized the following: (a) non-arts teachers would show stronger indicators of possessing linguistic and logical-mathematical dominant intelligences; (b) art teachers’ dominant intelligences would reveal higher degrees of musical, bodily-kinesthetic, spatial-visual, interpersonal, and intra-personal intelligences; and (c) the art teachers’ dominant intelligences would indicate higher levels of teacher efficacy in the areas of: (a) student engagement; (b) instructional practices; and (c) classroom management.

The independent variable was the participants’ score on the Multiple Intelligence Test, which determined the dominant intelligence or learning competency of both arts and non-arts teachers. The participants responded to 70-item survey, on a Likert Scale
from 1 to 4, which were then calculated to conclude teachers' dominant intelligences. The other independent variables were the teachers' demographic characteristics.

The dependent variables in this study defined by the researcher were as follows: (a) student engagement; (b) instructional strategies; and (c) classroom management, according to the participants' responses to the Teachers' Sense of Teacher Efficacy Survey.

Both general teaching efficacy and personal teaching efficacy were the two items measured in the teachers' efficacy studies headed by Rand Corporation (Armor et al., 1976; Berman et al., 1977), which asked teachers to rate their responses to two statements based on a five-point Likert scale (Tschannen-Moran, 2001). Personal teaching efficacy referred to teachers' beliefs about their ability to positively impact students learning. General teaching efficacy, on the other hand, encompassed teachers' beliefs about the power of factors outside of the school and teacher's control in affecting student performance (Tschannen-Moran, 2001).

Teachers' sense of efficacy potentially influenced (a) the environment created and (b) a variety of instructional practices introduced in the classroom (Bandura, 1997). Moreover, teachers with a high sense of self-efficacy were confident that the most challenging students could be reached.

Teachers with lower self-efficacy, on the contrary, felt a sense of vulnerability when it came to addressing the needs of unmotivated students (Gibson & Dembo, 1984). The literature vastly documented the large-scale influence of self-efficacy and its justification for the social cognitive theory, which originally positioned the beliefs of social cognition to the core of one's potential (Bandura, 2001).
Conclusions

The first hypothesis stated that non-arts teachers would show stronger indicators of possessing linguistic and logical-mathematical dominant intelligences. The population of art teachers, due to its limited size, caused the researcher to divide the participants into two groups based on the two hemispheres of the brain: (a) art teachers became the right-brain hemisphere group and (b) non-art teachers changed to the predominantly left-brain hemisphere group.

There was a significant finding concerning left-brain dominant intelligences (representing the non-art teachers) and logical-mathematical intelligences. The results also confirmed the hypothesis that non-art teachers (left-brain dominance) revealed stronger levels of logical-mathematical intelligence, which was a left-brain dominant intelligence. Consequently, the hypothesis was further shown to hold true with non-art teachers (left-brain dominance) resulting in no significant findings in demonstrating the following right-brain dominant intelligences: (a) bodily-kinesthetic; (c) spatial-visual; (d) interpersonal; and (e) intra-personal intelligences.

The group of non-art teachers, that was the most pronounced of all in its degree of logical-mathematical intelligence, was the math and science teachers, who surpassed all other groups in subject area taught. Math and science teachers (left-brain dominance) had a higher degree of logical-mathematical intelligence than that of the art teachers. Math and science teachers also showed higher levels of logical-mathematical intelligence than the ESE (Exceptional Student Education) and ESOL (English As A Second Language) teachers. Finally, the math and science teachers surpassed the participants teaching all other subject areas (left-and right-brain dominances).
Furthermore, teachers who taught all other subject areas (left- and right-brain dominances) showed a stronger level of logical-mathematical intelligence than English teachers. Teachers of all other subject areas also surpassed the logical-mathematical intelligence of ESE and ESOL teachers.

The second hypothesis explored whether or not art teachers' dominant intelligences would reveal higher degrees of right-brain dominant intelligences in the areas of: (a) musical; (b) bodily-kinesthetic; (c) spatial-visual; (d) interpersonal; and (e) intra-personal intelligences.

There was a significant finding concerning art teachers (right-brain dominance) and musical intelligence (right-brain dominance). However, there were no significant results in the remaining right-brain dominant intelligences areas: (a) bodily-kinesthetic intelligence; (b) spatial-visual intelligence; (c) interpersonal intelligence (d) intra-personal intelligence. The hypothesis was able to support right-brain dominant participants, from this particular convenience sample, as possessing greater levels of the right-brain intelligence in the area of musical intelligence.

The third hypothesis examined which type of learning competency (multiple intelligences) would have the greatest predictive value on high levels of teacher efficacy in the areas of: (a) student engagement; (b) instructional practices; and (c) classroom management.

The researcher explored the relationship between right and left-brain dominant intelligences and the three areas of teacher efficacy. The results of the Correlation Matrix revealed how right-brain dominance was correlated with student engagement and instructional strategies. Right-brain dominance did not appear to correlate with
classroom management. The findings were in alignment with how creativity, deriving from the right hemisphere of the brain, was necessary for teachers to excite students about learning and to reach a larger population of learners.

Left-brain dominance did not appear to correlate with student engagement and instructional strategies. Left-brain dominance did, however, correlate with classroom management. The findings were also connected to how the left hemisphere of the brain controls one's ability to plan and organize, all of which were essential for classroom management.

According to Gardner (1995), there was no single educational approach based on the multiple intelligences theory. Gardner recommended that educators were in a far better position to decide upon the uses of the multiple intelligences theory. Additionally, Gardner warned teachers of using all the intelligences while presenting new concepts or subjects. Most importantly to this particular research study, Gardner did not recommend the grading of intelligences, without regard to context or content (Gardner, 1995).

Demographics appeared to place more importance on teacher efficacy than the multiple intelligences themselves. An unexpected finding in teacher demographics and teacher efficacy resulted from the Chi-Square Test. The independent variable of familial status had a linear-by-linear association with both the dependent variables of (a) student engagement and (b) classroom management. The results suggested that teachers who had their own children were more capable of achieving high levels of student engagement in their classrooms.

The results also revealed a significant finding in the positive relationship between teachers who had children and the ability to effectively manage the classroom. The
number of children the teachers had appeared to be a positive predictor for both student engagement and classroom management.

Another area of teacher demographics that resulted in placing significance on teacher efficacy was grade level taught in the following two areas: (a) primary (grades K-5), and (b) secondary (grades 6-12). The influence that primary teachers had on student engagement was a significant finding, while the results for secondary teachers were less substantial.

**Teacher Demographics**

The researcher was unable to examine the relationship between the dominant intelligence of art teachers to that of non-arts teachers with only 13% of the total population constituting art educators. Therefore, the researcher investigated the subgroups of predominant left- and right- brain dominant intelligences to measure the effect on teaching styles.

The results suggested that teachers with a larger number of their own children felt much more capable of achieving high levels of student engagement in their classrooms.

The results revealed a significant finding in the positive relationship between teachers who had children and the ability to effectively manage the classroom. The number of children the teachers had appeared to be a positive predictor for both student engagement and classroom management.

An additional significant finding was the influence primary teachers had on student engagement. The results indicated that primary teachers (from kindergarten to grade 5) were more effective at engaging students in learning than the secondary teachers (from grades 6 to 12).
The Multiple Intelligences

The literature review revealed that Gardner identified an alternative perspective on human intelligence through the theory of multiple intelligences. The theory of multiple intelligences provided information concerning knowledge of the human brain and the identification of capabilities that were valued in cultures completely unlike that of the United States (Gardner, 1977).

According to Gardner, the central core of the arts that made them fundamentally cognitive in nature was the representation of certain ways of knowing. The theory of multiple intelligences implied that people were more inclined to learn when involved in an activity for which they have talent (Gardner, 1999).

The results of the researcher's study revealed how math and science teachers had a higher degree of logical-mathematical intelligence than that of art teachers. Gardner (1993) described logical-mathematical intelligence as the skill of distinguishing sizeable problems from less significant ones and how to solve those problems. Mathematicians possessed powerful reasoning abilities that assisted with detecting solutions long before having worked out each step in detail (Gardner, 1993).

The math and science teachers in this research study showed higher levels of logical-mathematical intelligence than the ESE (Exceptional Student Education) and ESOL (English As A Second Language) teachers, creating significance. Finally, the math and science teachers surpassed all other subject areas taught.

Mathematical intelligence in this area required a true understanding of how mathematics and logic work in the real world, in everyday life. Understanding the why in mathematics truly indicates an understanding of mathematic processes. Mathematical
intelligence involved the following process: (a) identifying a problem; (b) recognizing the problem as being worthy enough to solve; (c) creating an algorithm; and (d) attempting a solution is attempted (NCTM, 1989).

The literature review suggested that a multiple intelligences perspective boosted comprehension by providing: (a) compelling points of entry (the attention grabber); (b) analogies (models); and (c) numerous representations of the central idea of a topic (core ideas sown in different situations) (Gardner, 1999).

The art teachers (right-brain dominance) in this research study possessed a higher degree of musical intelligence than the ESE and ESOL teachers. The art teachers also revealed higher levels of musical intelligence than the teachers teaching all other subject areas. Gardner (1983) stated that musical intelligence emerged the earliest of all the other intelligences. The emphasis of musical intelligence derived from early childhood experiences that explored the creative potential of music and its development. The role of the educator in fostering the development of the musical intelligence was even more significant if the musical intelligence was recognized as a separate intelligence (Gardner, 1983).

Teacher Efficacy

The literature review explained how the term self-efficacy (Bandura, 1977) was based on one's expectations about the outcome of situations, heavily influenced by whether or not one thinks one would succeed at tasks after attempting to do so, and had a high degree of influence on one's expectations and performance.

In contrast, the cognitive social learning theory (Bandura, 1982) proposed that motivation was affected by: (a) outcome expectations (judgments about the consequences
of particular actions; and (b) efficacy outcomes (the belief that one is capable of reaching a certain level of performance in a given situation).

Furthermore, the literature review revealed that teachers with a high sense of self-efficacy were confident that even the most difficult students could be reached if they exerted extra effort. Teachers with lower self-efficacy, on the other hand, felt a sense of helplessness when it came to dealing with difficult and unmotivated students (Gibson & Dembo, 1984). However, the teachers who exhibited high levels of efficacy were less bureaucratic and sought to (a) facilitate student autonomy; (b) instill trust; and (c) foster student responsibility (Woolfolk & Hoy, 1990).

People who changed the way they thought would also have the behavior change. People, in turn, were more inclined to exhibit particular behaviors when they perceived themselves as being capable enough of executing those behaviors successfully (Tschannen-Moran & Hoy, 1998).

The results of the research study revealed a discrepancy between the ability to effectively impact student learning and to train parents how to better assist their children at school. The researcher’s results also showed that student engagement and classroom management were significantly influenced when teachers had children of their own. Both findings could positively impact the way schools districts similar to Palm Beach County plan professional development and parent and teacher trainings.

There are several possible reasons for why teachers could not bridge the gap between home and school: (a) school sites do not coordinate enough events for teachers to train parents how to specifically help children succeed at school; (b) teachers have difficulty scheduling times to meet with parents; (c) there is not enough professional
development training teachers on both the academic impact that parental involvement has on students and the means to make it happen; or (d) the respondents in the study overestimated the ability of positively motivating and managing difficult students in the area of student engagement.

Additionally, the results suggested that barriers existed between the teachers’ perceptions of themselves as being interpersonally gifted and efficacious teachers and their ability to help families provide alternative support network to students’ learning. The reasons for the results could be attributed to: (a) institutional problems; (b) socio-economic divisions in the community; (c) difficulties with understanding other language; or (d) situational barriers in the families themselves.

The results of the influence that multiple intelligences had on teacher efficacy showed how right-brain dominance had a greater impact on teacher efficacy in the areas of: (a) student engagement and (b) instructional practices. Left-brain dominance resulted significant in only classroom management.

Kolb (1976) developed a learning style inventory, which was designed to place learners on a line between concrete experience and abstract conceptualization; and active experimentation and reflective observation. Two of the learning style preferences were in correlation with left and right-brain dominant intelligences; (a) convergent learner-conceptualizes abstractions with ease (left-brain dominance) and (b) divergent learner-observes reflectively on concrete experiences (right-brain dominance).
Limitations

The timing of the research was inopportune for teachers to participate. The school district took an unanticipated amount of time in approving the research study, which caused participants to complete the study during the last month of the 2008-2009 school year and into the first week of summer vacation.

The response rate was not only lowered due to the timing of the study, but also the circumstances that the school district and its employees were under at the time. School districts across the nation were responding to severe budget cuts due to the global economic crisis of 2008 and 2009. At the exact time of the release of the study, teachers were being notified of job relocations within school sites, transfers to other school sites, and layoffs from the school district.

Additionally, the school district was under fire for not meeting federal standards regarding improving the student achievement levels of below proficiency students in K-12 education. Plans were underway, in turn, at the school district to hire a new chief academic officer who could unify the instructional practices of every teacher in every department on every level in the K-12 program. There was a sense of uncertainty among teachers concerning their positions in the school district and whether or not teachers could maintain autonomous in the classroom.

There were some unforeseen complications during the administration of the survey link, which severely hindered the amount of participants who were able to successfully participate in the study. First, Survey Monkey provided the researcher with a link that consisted of too many digits, causing difficulties for the participants. Teachers began e-mailing the researcher directly to report the problem. Approximately two weeks
into the study, the researcher contacted the vice president of Survey Monkey to request a new link. The president of the CTA (Classroom Teachers Association) who originally sent the link to the over 4,000 CTA members re-sent the link with a note encouraging teachers to try the new link again.

The other factor that may have caused many of the participants to leave several questions on the surveys blank was the length of the three surveys. The researcher chose the longer version of both the Teacher Efficacy and Multiple Intelligences Surveys to increase the validity of the participants’ results. However, the time requirement to complete the three surveys and the knowledge of oneself and the understanding of one’s own professional practices may have been too demanding for teachers during the last month of the school year. Consequently, 159 of the original 190 participants qualified for the study after having fully completed every answer on all three instruments. This resulted in a response rate of 83.7% for the surveys, which was reasonable compared to similar projects of this type.

The convenience sample in this study did not yield a large enough art teacher population. The reason for the lack of being able to target the art teacher population was due to restrictions the school district placed on access to employee e-mail addresses for research purposes. The researcher was granted access by the CTA (Classroom Teachers Organization) a local teachers union, for which the researcher is a member.

The following could also explain why teachers who work in Palm Beach County did not feel more confident about assisting families with their children’s education: (a) institutional weaknesses of not providing educators with the time and resources needed to link families with schools; (b) diverse socio-economic backgrounds that reflect that high
poverty rate in pockets of the county; (c) language barriers; and (d) dispositional or situational barriers in the families themselves.

Finally, it is important to note that the actual skill of directly impacting at-risk students in a positive way should be transferable to training parents how to help students succeed at school, if systemic problems are not hindering educators from successfully accomplishing it.

**Recommendations for Future Research**

The timing of the administration of research studies is critical when approval from school districts is necessary to conduct research. Researchers in the future should consider conducting research at school districts where research is a priority and where the process of approving research is more efficient in nature.

The literature review explored how learning through the arts altered the neural pathways and neuronal firing patterns in the brain and resulted in the transfer of skills. Participation in the arts reorganized the way the brain functioned to allow for a deeper understanding and greater ability to perform other tasks (Catterall, 2005).

Researchers in the future could conduct a study examining the perceptions of students concerning how teachers demonstrated the dominant intelligences to raise student achievement. Students who have the opportunity to use the multiple intelligences to learn new information also have the chance to learn in their preferred modality, thus resulting in higher motivation and increased participation. Future research could examine the impact that the multiple intelligences have on student involvement from the student’s perspective and in turn, student achievement.
Perhaps it would be beneficial for researchers to explore a larger population consisting only of primary teachers, who lay the foundation of expectations from the beginning, and the transfer of the first-hand experience of nature-nurture in the personal lives of teachers to the professional world.

Future research could also be conducted at school districts regarding the effect of implementing a combination of trainings for primary and secondary teachers. The focus of the research could examine more specifically the practices of primary teachers involved with raising student engagement. Researchers could also explore ways to facilitate the transfer of learning between primary and secondary teachers. Finally, future research could examine the effectiveness of unified trainings that could include: (a) teachers; (b) parents; and (c) students working collaboratively to raise student achievement and tighten the line of communication between schools and their communities.

The results of the research study could be further investigated in other disciplines, such as in the area of sociology. Demographics played a key component in the results of this research study. The literature review revealed very little evidence in the area of the familial status of teachers and student achievement.

Future research could also probe into the characteristics of parenting that positively impact student achievement. The research could examine more closely how women with families manage their classrooms more effectively and engage students in learning. The ability of successfully transferring the nature-nurture qualities of teachers who have had children of their own to those teachers who are childless could also be explored.
Research on the dominant intelligences of teachers and how they impact student learning might be more inclusive with a greater population of art teachers participating in the study. A larger scale research study in the future could invite art organizations on national, state, and local levels to participate in a nation-wide study to further explore the results of a larger art teacher population.

**Implications for Practice**

Teacher demographics revealed a surprising finding in the area of teacher efficacy. The results showed that student engagement and classroom management were significantly influenced when teachers had children of their own. More research in the future could be conducted in the area of the familial status of teachers. The results would be critical for human resource departments in school districts across the nation. The reasons for many teachers not having more children could be attributed to: (a) expensive premiums for insuring families of school district employees; (b) costly childcare expenses; and (c) low teacher salaries.

If the results were to yield positive findings in the area of familial status and student engagement, districts could consider how to implement family-friendly policies that would encourage teachers to have children and assist teachers in the costs involved with parenting. Future research could explore the beneficial effect from reduced day care programs for educators on student engagement and classroom management.

School districts also might be more compelled to investigate ways schools may connect the gap between home and school. The literature review suggested that very little research has explored the role of teachers in family involvement and the process of
building partnerships with parents, although many studies have reported on the positive outcomes of family involvement (Henderson & Mapp, 2002).

More trainings and resources could be allotted to teachers as to how educators could convey academic concerns to parents and assist parents with helping their children succeed at school. The literature review suggested that when teachers held positive beliefs about families and viewed parents as a child's first teacher, they were more likely to invite parents to become active participants in their children's education (Epstein & Dauber, 1991; Eccles & Harold, 1996).

Trainings at school districts and school sites could capitalize on the notion of both: (a) the parent as a child’s first teacher and (b) the teacher’s ability as a parent to better engage students in learning and manage classrooms. Home involvement practices, such as reading with children and homework help, were essential predictors of student achievement (Izzo, Weissberg, Kasprow & Fendrich, 1999).

Parental expectations were also noteworthy to student performance in school and vital to student academic achievement. High expectations from parents were associated with higher levels of educational achievement. Additionally, the research suggested that the following were of equal importance to academic achievement: (a) child rearing beliefs; (b) requirements for enriching home environments; and (c) uniformed standards of suitable behavior in and outside of school (Jencks and Phillips, 1998; Okagaki & Frensch, 1998, Wong, 1990).

"The more families support their children's learning and education progress, the more their children tend to do well in school and continue their education" (Henderson & Mapp, 2002, p. 30). Research on parental involvement in the future could also seek to:
(a) identify the barriers blocking communication between schools and home; (b) generate strategies for improving parental involvement; and (c) educate both teachers and parents of the worthy research on predictors of student achievement. The purpose of the study could be on how teachers effectively relay the educational concerns of children and the proper implementation of addressing those needs on the parents’ behalf. Furthermore, when schools fostered communication and facilitated parental involvement, families became more involved in the school and community (Scribner, Young & Pedroza, 1999).

The literature review supported the notion that students tended to thrive more at school when their home and school cultures were similar. Conversely, students were less successful when there was a disconnection between the home and the school culture, especially with minority and low-income students. The literature also suggested that the remedy for lessening the disconnection would be for schools to work with both students and their families in adapting to the school culture (Delgado-Gaitan, 1992; Trueba, 1988; Wells, 1990).

The second hypothesis in this research study was formulated under the assumption that teachers who were highly involved in the arts or who demonstrated higher levels of right-brain dominance required in the arts would result in marked differences in student achievement. The literature review on the multiple intelligences suggested that the purpose of the multiple intelligences was to focus on children’s intelligences, not the assessment of each child’s intelligence (Gardner, 1995). Perhaps educators would benefit from the findings of this research study that do not support examining the multiple intelligences in isolation, yet evaluating how the combination of all intelligences are necessary to boost student learning.
The literature review also found substantial differences in achievement, attitudes, and behavior among youth highly involved in the arts with those who had little or no engagement in the arts, regardless of students’ socio-economic status (Caterall, 1999).

The implications of the results also suggested that the responsibilities of teaching could require that both hemispheres of the brain work compatibly, rather than independently, to effectively teach and manage a classroom. The creativity required to problem solve aspects of the psychology of human behavior appeared to be as equally important to the systematic form of thought process necessary to establish rules and enforce them. Each of the dominant intelligences appeared to be as noteworthy, in terms of their role and impact on teaching, as the other.
References


for Family & Community Connections with Schools: Southwest Educational Development laboratory.


www.ed.gov/adsms/lead/read/rb/edlite-index.html


Van De Weghe, R. (2005). What are the effects of writing-to-learn programs?


APPENDIX A

THE TEACHER DEMOGRAPHIC PROFILE CHECKLIST
The Teacher Demographic Profile Checklist

INSTRUCTIONS: Please choose the category that best describes you.

1. Your first language: □ English □ Spanish □ Other:
2. Your age: □ 20-30 □ 31-40 □ 41-50 □ 51-60 □ 61+
3. Your gender: □ Male □ Female
4. Your race: □ Caucasian □ African American □ Hispanic □ Asian □ Other:
5. Your marital status: □ Married □ Single □ Divorced
6. Your familial status: □ One Child □ Two children □ Three or more children
7. Your educational level: □ Undergraduate □ Master’s degree □ Doctorate degree
   □ Other:
8. Number of years teaching: □ 1-5 □ 6-10 □ 11-15 □ 16-20 □ 21-25 □ 26-30 □ 31+
9. Subject areas taught: □ English or Reading □ Math □ Science □ Social Studies or History
   □ Writing □ Physical Education □ Visual Arts □ Theater □ Music □ Foreign Language □ ESE
   (Exceptional Student Education) □ ESOL (English As A Second Language) □ Other:
10. Grade level: □ Kindergarten □ First □ Second □ Third □ Fourth □ Fifth □ Sixth □ Seventh □
    Eighth □ Ninth □ Tenth □ Eleventh □ Twelfth
APPENDIX B

THE MULTIPLE INTELLIGENCES TEST
Multiple Intelligences Test - based on Howard Gardner's MI Model

(manual version - see businessballs.com for self-calculating version)

Score the statements: 1 = Mostly Disagree, 2 = Slightly Disagree, 3 = Slightly Agree, 4 = Mostly Agree

Alternatively for speed, and if easier for young people - tick the box if the statement is more true for you than not.

Adults over 16 complete all questions. Young people between 9-16 answer red questions only. This is page 1 of 4.

A short version featuring the young people's questions only is available free from the businessballs website.

Score or tick the statements in the white-out boxes only

<table>
<thead>
<tr>
<th>Statement</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>I like to learn more about myself</td>
<td></td>
</tr>
<tr>
<td>I can play a musical instrument</td>
<td></td>
</tr>
<tr>
<td>I find it easiest to solve problems when I am doing something physical</td>
<td></td>
</tr>
<tr>
<td>I have a song or piece of music in my head</td>
<td></td>
</tr>
<tr>
<td>I find budgeting and managing my money easy</td>
<td></td>
</tr>
<tr>
<td>I find it easy to make up stories</td>
<td></td>
</tr>
<tr>
<td>I have always been physically well co-ordinated</td>
<td></td>
</tr>
<tr>
<td>When talking to someone, I tend to listen to the words they use not just what they mean</td>
<td></td>
</tr>
<tr>
<td>I enjoy crosswords, word searches or other word puzzles</td>
<td></td>
</tr>
<tr>
<td>I don't like ambiguity, I like things to be clear</td>
<td></td>
</tr>
<tr>
<td>I enjoy logic puzzles such as 'sudoku'</td>
<td></td>
</tr>
<tr>
<td>I like to meditate</td>
<td></td>
</tr>
<tr>
<td>Music is very important to me</td>
<td></td>
</tr>
<tr>
<td>I am a convincing liar (if I want to be)</td>
<td></td>
</tr>
<tr>
<td>I play a sport or dance</td>
<td></td>
</tr>
<tr>
<td>I am very interested in psychometrics (personality testing) and IQ tests</td>
<td></td>
</tr>
<tr>
<td>People behaving irrationally annoy me</td>
<td></td>
</tr>
<tr>
<td>I find that the music that appeals to me is often based on how I feel emotionally</td>
<td></td>
</tr>
<tr>
<td>I am a very social person and like being with other people</td>
<td></td>
</tr>
<tr>
<td>I like to be systematic and thorough</td>
<td></td>
</tr>
<tr>
<td>I find graphs and charts easy to understand</td>
<td></td>
</tr>
<tr>
<td>I can throw things well - darts, skipping, classics, frisbees, etc.</td>
<td></td>
</tr>
<tr>
<td>I find it easy to remember quotes or phrases</td>
<td></td>
</tr>
<tr>
<td>I can always recognise places that I have been before, even when I was very young</td>
<td></td>
</tr>
<tr>
<td>I enjoy a wide variety of musical styles</td>
<td></td>
</tr>
<tr>
<td>When I am concentrating I tend to doodle</td>
<td></td>
</tr>
<tr>
<td>I could manipulate people if I choose to</td>
<td></td>
</tr>
<tr>
<td>I can predict my feelings and behaviours in certain situations fairly accurately</td>
<td></td>
</tr>
<tr>
<td>I find mental arithmetic easy</td>
<td></td>
</tr>
<tr>
<td>I can identify most sounds without seeing what causes them</td>
<td></td>
</tr>
<tr>
<td>At school one of my favourite subjects is / was English</td>
<td></td>
</tr>
<tr>
<td>I like to think through a problem carefully, considering all the consequences</td>
<td></td>
</tr>
<tr>
<td>I enjoy debates and discussions</td>
<td></td>
</tr>
<tr>
<td>I love adrenaline sports and scary rides</td>
<td></td>
</tr>
<tr>
<td>I enjoy individual sports best</td>
<td></td>
</tr>
<tr>
<td>I care about how those around me feel</td>
<td></td>
</tr>
<tr>
<td>My house is full of pictures and photographs</td>
<td></td>
</tr>
<tr>
<td>I enjoy and am good at making things - I'm good with my hands</td>
<td></td>
</tr>
<tr>
<td>I like having music on in the background</td>
<td></td>
</tr>
<tr>
<td>I find it easy to remember telephone numbers</td>
<td></td>
</tr>
</tbody>
</table>

275
I set myself goals and plans for the future
I am a very tactile person
I can tell easily whether someone likes me or dislikes me
I can easily imagine how an object would look from another perspective
I never use instructions for flat-pack furniture
I find it easy to talk to new people
To learn something new, I need to just get on and try it
I often see clear images when I close my eyes
I don't use my fingers when I count
I often talk to myself - out loud or in my head
At school I loved / love music lessons
When I am afraid, I find it easy to pick up the basics of another language
I find ball games easy and enjoyable
My favourite subject at school is / was maths
I always know how I am feeling
I am realistic about my strengths and weaknesses
I keep a diary
I am very aware of other people's body language
My favourite subject at school was / is art
I find pleasure in reading
I can read a map easily
It upset me to see someone cry and not be able to help
I am good at solving disputes between others
I have always dreamed of being a musician or singer
I prefer team sports
Singing makes me feel happy

I never get lost when I am on my own in a new place
If I am learning how to do something, I like to see drawings and diagrams of how it works
I am happy spending time alone
My friends always come to me for emotional support and advice

<table>
<thead>
<tr>
<th>Intelligence type</th>
<th>your totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic</td>
<td></td>
</tr>
<tr>
<td>Logical-Mathematic</td>
<td></td>
</tr>
<tr>
<td>Musical</td>
<td></td>
</tr>
<tr>
<td>Bodily-Kinesthetic</td>
<td></td>
</tr>
<tr>
<td>Spatial-Visual</td>
<td></td>
</tr>
<tr>
<td>Interpersonal</td>
<td></td>
</tr>
<tr>
<td>Intrapersonal</td>
<td></td>
</tr>
</tbody>
</table>

Add the scores or ticks in each column and write the total for each column in the boxes on the right.

Your highest scores indicate your natural strengths and potential - your natural intelligences.

There are no right or wrong answers.

My strongest intelligences are (write them here):

You are happiest and most successful when you learn, develop, and work in ways that make best use of your natural intelligences (your strengths and style and brain-type).

This indicator can help you to focus on the sort of learning and work that will be most fulfilling and rewarding for you.

The multiple intelligences definitions are available in sheet 2 of the MSExcel file containing this test. The file and more information about multiple intelligences are available from the website www.businessballs.com.
APPENDIX C

THE TEACHER EFFICACY TEST
Teachers' Sense of Efficacy Scale (long form)

<table>
<thead>
<tr>
<th>Teacher Belief</th>
<th>How much can you do?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) (2) (3) (4) (5)</td>
</tr>
<tr>
<td>1. How much can you do to get students to do what you ask?</td>
<td>(5) (4) (3) (2) (1)</td>
</tr>
<tr>
<td>2. How much do you believe your students know it?</td>
<td>(5) (4) (3) (2) (1)</td>
</tr>
<tr>
<td>3. How much can you do to make students believe in the class?</td>
<td>(5) (4) (3) (2) (1)</td>
</tr>
<tr>
<td>4. How much can you do to make students stay in school?</td>
<td>(5) (4) (3) (2) (1)</td>
</tr>
<tr>
<td>5. How much can you do to help your students feel safe?</td>
<td>(5) (4) (3) (2) (1)</td>
</tr>
<tr>
<td>6. How much can you do to help students believe in you?</td>
<td>(5) (4) (3) (2) (1)</td>
</tr>
<tr>
<td>7. How much can you do to get students to believe in themselves?</td>
<td>(5) (4) (3) (2) (1)</td>
</tr>
<tr>
<td>8. How much can you do to help students learn?</td>
<td>(5) (4) (3) (2) (1)</td>
</tr>
<tr>
<td>9. How much can you do to help students develop self-esteem?</td>
<td>(5) (4) (3) (2) (1)</td>
</tr>
</tbody>
</table>

Directions for Scoring the Teachers' Sense of Efficacy Scale

Developers: Megan Tschannen-Moran, College of William and Mary
Anita Woolfolk Hoy, The Ohio State University

Construct Validity

For information on the construct validity of the Teachers' Sense of Teacher efficacy Scale, see:


Factor Analysis

It is important to conduct a factor analysis to determine how your participants respond to the questions. We have consistently found there are three moderately correlated factors: Efficacy in Student Engagement, Efficacy in Instructional Practices, and Efficacy in Classroom Management, but at times the make up of the scales varies slightly. With preservice teachers we recommend that the full 24-item scale (or 12-item short form) be used, because the factor structure often is less distinct for these respondents.

Subscale Scores

To determine the Efficacy in Student Engagement, Efficacy in Instructional Practices, and Efficacy in Classroom Management subscale scores, we compute unweighted means of the items that load on each factor. Generally these groupings are:

Long Form

<table>
<thead>
<tr>
<th>Scale</th>
<th>Items</th>
<th>Long Form</th>
<th>Items</th>
<th>Short Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficacy in Student</td>
<td>1, 2, 4, 6, 9, 12, 14, 22</td>
<td></td>
<td>7, 10, 11, 17, 18, 20, 23, 24</td>
<td></td>
</tr>
<tr>
<td>in Instructional Practices</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>in Classroom Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Short Form

<table>
<thead>
<tr>
<th>Scale</th>
<th>Items</th>
<th>Short Form</th>
<th>Items</th>
<th>Long Form</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficacy in Student</td>
<td>2, 3, 4, 11</td>
<td></td>
<td></td>
<td>1, 2, 4, 6, 9, 12, 14, 22</td>
<td></td>
</tr>
<tr>
<td>in Instructional Practices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>in Classroom Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reliabilities

In Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing and elusive construct. Teaching and Teacher Education, 17, 783-805, the following were found:

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean</th>
<th>SD</th>
<th>alpha</th>
<th>Mean</th>
<th>SD</th>
<th>alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSTES</td>
<td>7.1</td>
<td>.94</td>
<td></td>
<td>7.1</td>
<td>.98</td>
<td>.90</td>
</tr>
<tr>
<td>Engagement</td>
<td>7.3</td>
<td>1.1</td>
<td>.87</td>
<td>7.2</td>
<td>1.2</td>
<td>.81</td>
</tr>
<tr>
<td>Instruction</td>
<td>7.3</td>
<td>1.1</td>
<td>.91</td>
<td>7.3</td>
<td>1.2</td>
<td>.86</td>
</tr>
<tr>
<td>Management</td>
<td>6.7</td>
<td>1.1</td>
<td>.90</td>
<td>6.7</td>
<td>1.2</td>
<td>.86</td>
</tr>
</tbody>
</table>

1 Because this instrument was developed at the Ohio State University, it is sometimes referred to as the Ohio State Teacher Efficacy Scale. We prefer the name, Teachers' Sense of Efficacy Scale.
APPENDIX D

PERMISSION FOR USE OF INSTRUMENTS
Re: Permission to Use Multiple Intelligences Survey On-Line

From: alan chapman
Sent: Mon 2/09/09 5:05 AM
To: Lavinia Draper

Lavinia,

Yes, this is perfectly okay to use the survey on line.

Best wishes

Alan

----- Original Message -----

From: Lavinia Draper
To: alan chapman ; Dr.Cynthia andreas
Sent: Monday, February 09, 2009 1:54 AM
Subject: Permission to Use MI Survey On-Line

Hi Alan,
Could I have your permission to use your Multiple Intelligences survey on-line?
Thank you,
Lavinia
Re: Permission to Use Teacher Efficacy Survey

From: Anita Hoy

Sent: Tue 9/30/08 1:46 PM

To: Lavinia Draper

You are welcome to use that instrument, but our more recent one, the TSES is available at http://www.coe.ohio-state.edu/ahoy/researchinstruments.htm

On Sep 27, 2008, at 12:01 PM, Lavinia Draper wrote:

Hello Dr. Woolfolk,

My name is Lavinia Draper and I'm a full-time reading teacher at a magnet school of the arts in Palm Beach County, Florida. I'm working on my chapter 3 methodology section of my dissertation titled The Relationship between Teacher Efficacy and Multiple Learning Competencies with Art and Non-Art Educators.

I would like to request permission to use your Teacher Efficacy instrument (Woolfolk, A.E., & Hoy, W.K., 1990). If I gain access to our school district's e-mail system, I'll administer the instrument via e-mail.

Thank you for your time, and I look forward to hearing from you.

Lavinia Draper
APPENDIX E

VOLUNTARY CONSENT FORM
Authorization for Voluntary Consent  
Lynn University  
3601 N. Military Trail Boca Raton, Florida 33431

PROJECT TITLE: The Relationship between Teacher Efficacy and Multiple Learning Competencies with Arts and Non-Arts Educators  
Project IRB Number: _________ Lynn University 3601 N. Military Trail Boca Raton, Florida 33431

I, Lavinia Hallowell Draper, am a doctoral student at Lynn University. I am studying Global Leadership, with a specialization in education. One of my degree requirements is to conduct a research study.

DIRECTIONS FOR THE PARTICIPANT:  
You are being asked to participate in my research study. Please read this carefully. This form provides you with information about the study. The principal investigator Lavinia Hallowell Draper will answer all of your questions. Your participation is entirely voluntary and you can refuse to participate without penalty or loss of benefits to which you are otherwise entitled. You acknowledge that you are at least 18 years of age, and that you do not have medical problems or language or educational barriers that precludes understanding of explanations contained in this authorization for voluntary consent.

PURPOSE OF THIS RESEARCH STUDY:  
The purpose of this non-experimental causal-comparative study will be to determine whether the subject areas educators teach determine a pattern of learning competencies among non-arts and art teachers, as measured by the Multiple Intelligences Test. This study also seeks to determine if there is a possible relationship between certain dominant intelligences (Multiple Intelligences) and the results of teachers' perceptions of teacher efficacy, as measured by the Teachers' Sense of Efficacy Scale Test. The ultimate goal of this study is to determine which dominant intelligences have the most profound impact on teacher efficacy in the areas of: (a) student engagement; (b) instructional practices; and (c) classroom management.

There are approximately 6,000 K-12 teachers from every subject area employed at a Southeast Florida school district who are invited to participate in this study.

PROCEDURES:  
1. After reading this consent form, click on "I agree to participate" to give your consent so that you will immediately begin the surveys. Otherwise, you should click on "I do not agree to participate in the survey" to exit.  
2. The Teacher Demographic Profile Checklist will appear first. You will click on your
choices to the ten questions asked about your professional and personal background in teaching.

3. After clicking on "next," you will be see the Teacher's Sense of Efficacy Scale Test. You will answer the twenty-four questions on a Likert scale between 1 and 9, which measures the degree to which you are able to complete the tasks regarding teacher efficacy and click on "next."

4. Finally, the Multiple Intelligences Test will appear on the screen. You will answer the seventy questions on a Likert scale between 1 and 4, which measures the degree to which you agree with the statements about the Multiple Intelligences, and you will click on "submit."

You will complete the survey in private and the web site is unable to track the IP address or collect any identification information linking participants to the survey data. The data will be kept confidential and stored electronically on "password protected" computers. The data will be destroyed after five years. All responses will be reported as a group. Therefore, the researcher will not know who is participating in the survey and who is not. The identity of participants will be protected to the degree allowed by technology and will be anonymous to the researcher.

1. Teacher Demographic Profile Checklist (5 minutes)
2. Teacher's Sense of Efficacy Scale Test (5-10 minutes)
3. Multiple Intelligences Test (5-10 minutes)

POSSIBLE RISKS OR DISCOMFORT: This study involves minimal risk. In addition, participation in this study requires a minimal amount of your time and effort.

POSSIBLE BENEFITS: There may be no direct benefit to you in participating in this research. But knowledge may be gained which may facilitate instructional innovation in the fields of the arts and teacher efficacy.

FINANCIAL CONSIDERATIONS: There is no financial compensation for your participation in this research. There are no costs to you as a result of your participation in this study.

ANONYMITY:
Surveys will be anonymous. You will not be identified and data will be reported as "group" responses. Participation in this survey is voluntary and return of the completed survey will constitute your informed consent to participate. All data will be destroyed after five years. Every effort will be made to maintain anonymity. Your identity in this study will be treated as confidential. Data will be coded with that code number. Your e-mail address, IP address, and individual responses will not be identified nor tracked as part of data collection. Anonymity will be maintained to the degree permitted by the technology used. Specifically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties.
The results of this study may be published in a dissertation, scientific journals or presented at professional meetings. In addition, your individual privacy will be maintained in all publications or presentations resulting from this study.

All the data gathered during this study, which were previously described, will be kept strictly confidential by the researcher. Data will be stored in locked files and destroyed at the end of the research. All information will be held in strict confidence and will not be disclosed unless required by law or regulation.

**RIGHT TO WITHDRAW:** You are free to choose whether or not to participate in this study. There will be no penalty or loss of benefits to which you are otherwise entitled if you choose not to participate. If you decide not to participate, there is no impact on your course grade.

**CONTACTS FOR QUESTIONS/ACCESS TO CONSENT FORM:** Any further questions you have about this study or your participation in it, either now or any time in the future, will be answered by Lavinia Hallowell Draper who may be reached at: [Contact Information] and Dr. Andreas, faculty advisor who may be reached at: [Contact Information] For any questions regarding your rights as a research subject, you may call Dr. Farazmand, Chair of the Lynn University Institutional Review Board for the Protection of Human Subjects, at [Contact Information]. If any problems arise as a result of your participation in this study, please call the Principal Investigator (Lavinia Hallowell Draper) and the faculty advisor (Dr. Andreas) immediately.

A copy of this consent form will be given to you.

**INVESTIGATOR'S AFFIDAVIT:**
I hereby certify that a written explanation of the nature of the above project has been provided to the person participating in this project. A copy of the written documentation provided is attached hereto. By the person's consent to voluntary participate in this study, the person has represented that he/she is at least 18 years of age, and that he/she does not have a medical problem or language or educational barrier that precludes his/her understanding of my explanation. Therefore, I hereby certify that to the best of my knowledge the person participating in this project understands clearly the nature, demands, benefits, and risks involved in his/her participation.

______________________________ Date of IRB Approval: __________________

Signature of Investigator

☐ Yes, I agree to participate in this study.

☐ No, I do not agree to participate in this study.