THE EFFECTS OF AN ARTS-BASED CURRICULUM ON ACADEMIC ACHIEVEMENT

A Dissertation
Submitted to the Graduate School of Tennessee State University in Partial Fulfillment of the Requirements for the Degree of Doctor of Education

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Melissa D. McClure

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To the Graduate School:

We are submitting a dissertation by Melissa D. McClure entitled “The Effects of an Arts-Based Curriculum on Academic Achievement.” We recommend that it be accepted in partial fulfillment of the requirements for the degree, Doctor of Education in Curriculum and Instruction.

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DEDICATION

Sydney and Dalton, just as I have dedicated my life to you, I dedicate my dissertation to you. You have taught me that life is precious. You are the reason that I breathe, the reason for which I live. You have been with me through this long, difficult journey. I am so very grateful that you were with me as I accomplished my dream of earning my doctoral degree.

My dream for each of you is that you find true happiness, love, and success in life. I want you to experience life’s disappointments as well as life’s blessings, for it is through the difficult trials that you gain strength. “That which does not kill us, makes us stronger.”
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ABSTRACT

MELISSA D. MCCLURE. The Effects of an Arts-Based Curriculum on Academic Achievement (under the direction of DR. MARY BESS DUNN).

The purpose of this study was to determine whether attending an arts-based middle school appeared to positively impact student academic achievement as measured by standardized achievement tests. In order to determine whether patterns of improved academic achievement were discernable following attendance at a four-year arts-based middle school, achievement data from the grade four and grade eight Tennessee Comprehensive Assessment Program (TCAP) and the grade nine through twelve Gateway Test were examined. The study examined differences between score trends, differences between scores for students from an arts-based curriculum vs. those from a standard curriculum; specifically differences between the three standardized dependent measures of (a) language arts scores, (b) mathematics scores, and (c) science scores. The study found that the arts-based curriculum group had higher grade 8 and grade 9-12 overall standardized scores than the standard curriculum group. In addition, the overall standardized mean test score values for the arts-based curriculum group was higher than the overall standardized mean test scores for the standard curriculum group.
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CHAPTER I

INTRODUCTION

“The quality of civilization can be measured through its music, dance, drama, architecture, visual art, and literature. We must give our children knowledge and understanding of civilization’s most profound works.”

-Ernest L. Boyer

In ancient times, knowledge of the arts was considered by some societies as a privilege of the social elite. Others felt that the arts were fit only for slaves and the children of artisans (Efland, 1990). By the end of the eleventh century, the development of trade brought about a new social order and the development of institutions for the artist such as craft guilds, apprenticeships, and workshop treatises (Efland, 1990). In early American history, the arts were a vital part of daily life, from religious songs and dances to intricately designed paintings and sculptures (Anderson, 1995).

Americans are said to have matured culturally after World War II (Berube, 1999). The United States sustained its economic power, and with the GI Bill of Rights, two-and-a-half million veterans received a college education expanding the country’s economic base. Affluence and increasing levels of education produced a culturally conscious society. The number of artists in all fields more than doubled between 1970 and 1990; museums grew by fifty percent (Berube, 1999).
Even though the economic impact of the arts was strong, the role of the arts in education endured a difficult history (Berube, 1999). The first speculative efforts to introduce art curricula into public education began late in the nineteenth century. Progressive education reformers led by John Dewey eventually established incorporation of the arts into the school curricula (Berube, 1999).

By the 1930s, classroom teachers were being encouraged to integrate art with core academic subjects (Brewer, 2002). However, in the aftermath of World War II, many Americans criticized integrated art curriculum because the arts were then considered frivolous and fluffy. Specific art study in school became subservient to academic subjects and was no longer valued on its own. General art study was the first part of the curriculum to be removed from public schools when there was a call for a return to the basics after the launching of the Soviet satellite Sputnik in 1957 during the early days of the Cold War (Brewer, 2002).

Educators who support the arts in schools have worked diligently to identify their function in the school curriculum (Walling, 2001). Typically, and overall, the arts have played a rather insignificant role in American schools. Efforts to raise standards, focus on academic fundamentals, and close the achievement gap between American schools and other schools internationally, especially in math and the sciences, have increasingly diminished the importance of the arts in public school classrooms (Rabkin & Redmond, 2006). In the midst of growing concern that American students are falling behind internationally and that American schools are not academically rigorous, the arts compete for a place in the curriculum with subjects viewed as more imperative, even more
cognitive in nature. The decade of the 1990s witnessed proposed and actual cutbacks in funding for arts and arts education programs on federal, state, and local levels (Luftig, 1994). The No Child Left Behind Act of 2001 (NCLB) attempted to reshape public education in the United States. Although the arts were originally included in NCLB, funds were restricted to thirty million dollars and focused only on programs that integrated the arts into the core curriculum (Chapman, 2004).

The pressures of high-stakes testing and a continual devaluing of arts education have once again pushed the arts to the edge of school curriculum. Objective test results and state mandates currently drive education, particularly curriculum. Zwirn and Graham (2005) affirmed that the obsession with describing schools in terms of numbers and facts leaves little room for imagination and personal exploration. Additionally, art specialists are considered unessential as school administrators focus on providing resources for test preparation, remediation, and intervention programs.

Arts educators have tried to strengthen the position of the arts by claiming that the arts could help children learn to read, write, calculate and understand scientific concepts thereby improving learning in the 3Rs (Hetland & Winner, 2001). Hetland and Winner argued that this approach was used to increase the value of the arts. The arts should be kept in school programs because they strengthen and sustain skill development in solid academic areas.

At the end of the 1990s, the comprehensive results in all arts areas on the National Assessment of Educational Progress (NAEP) for Creating, Performing, and Responding showed statistically significant patterns of achievement among females, White and Asian
students, and higher levels of parental education (Persky, Sandene, & Askew, 1998). In a two-year study that examined the artistic experiences of elementary and middle school students, Burton, Horowitz, and Abeles (1999) concluded that the higher-order thinking skills and personal qualities essential for academic success were stronger in high-arts schools when students had studied several arts over time.

Rose, Parks, Androes, and McMahon (2000) reported that drama-based instruction had a significant impact on the reading comprehension scores of fourth grade students as measured by the Iowa Test of Basic Skills (ITBS). In a study that explored connections between the arts and human development and academic achievement, Catterall, Chapleau, and Iwanaga (1999) reported significant achievement differences between high-arts and low-arts exposure with economically disadvantaged students. An analysis of the results from The Comic Book Project, an arts-based literacy program for youth in urban after-school programs, revealed that students met the four New York State Learning Standards for English Language Arts (Bitz, 2004).

Conversely, Forseth (1980) found that although art activities seemed to positively influence students’ attitudes toward core subjects, they had little or no effect on academic achievement. Luftig (1994) reported no differences on achievement measures, except in one school district where differences on total math scores were found by gender. Walker and Schaffarzick (1981) found that traditional and arts-based curricula produced different patterns of achievement, but not necessarily improved achievement.
Statement of the Problem

Hetland and Winner (2001) conducted a meta-analysis of research on art education and academic achievement titled Reviewing Education and the Arts Project (REAP). The researchers found three areas in which reliable causal links could be demonstrated between the arts and academic achievement in non-arts areas. Inversely, Hetland and Winner identified seven areas where no reliable causal links were found. If the value of the arts in American schools lies only within the claim that they produce a positive effect on academic performance, then the arts will lose their value since it appears that they may not have such an effect (Hetland & Winner, 2001). However, Hetland and Winner argued that the arts must be valued for what they teach that no other subject can.

As one can see, the problem is conflicting data. Whether a participatory arts-in-education program has a positive impact on academic achievement is still unclear. Therefore, inclusion of the arts in public school curriculum, paid for by dwindling tax dollars, will continue to be viewed as nothing more than nice but insignificant and nonessential. Unfortunately, too few studies exist that explore the long-term effects of the arts on academic achievement. Additional, long-term studies would add to the research base on the relationship between participation in arts programs and achievement in schools. That is, exposure to the participatory arts may have a positive effect on academic achievement over time.
Significance of the Study

If the extent of art in a culture is any indication of the quality of the culture, of the humanity, the heart and soul of a society as many have argued (Davis, 1999; Dissanayake, 1999; Eisner, 1998), then exposure to art in some form is important and inclusion of the arts in public schools is the only way to reach the vast majority of our nation’s citizens. Since standardized and criterion-referenced achievement testing is currently considered the “gold standard” for determining the value and efficacy of public schooling, such testing must be taken into consideration. Administrators and other decision makers want to know the effect on test scores when considering whether to increase time and money allotted for participation in the arts. From a purely pragmatic point of view, educators need to know if arts programs make a difference over time. Teachers, parents, and community leaders may also be interested in knowing whether participation in the arts tends to increase student academic achievement in schools. Therefore, the results of such studies are both important and valuable.

Purpose of the Study

The purpose of this study was to determine whether attending an arts-based middle school positively impacted student academic achievement as measured by standardized achievement tests. To add to the body of knowledge on the impact of an arts-based education program on academic achievement, data from grades four, eight, and nine through twelve were collected retrospectively on sixty-nine students who all attended a middle school with an intense arts-based program. The school, Mt. Pleasant Middle School of the Visual and Performing Arts (MPMSVPA), is a neighborhood

public middle school in south central Tennessee. Each of the students selected for participation in the study continued to graduation from Mt. Pleasant High School (MPHS). Comparison data from grades four, eight, and nine through twelve were collected retrospectively from a random sample of seventy graduates of other high schools within the same county. Each of these graduates attended a middle school in the county other than Mt. Pleasant Middle School of the Visual and Performing Arts. All students comprising both groups graduated in 2008.

Achievement data from the grade four 2000 Tennessee Comprehensive Assessment Program (TCAP) test scores were used as a baseline measurement to determine the initial academic score of each participant. Assessment data from the grade eight 2004 TCAP test scores of Mt. Pleasant Middle School of the Visual and Performing Arts (MPMSVPA) in Maury County were compared to the test scores of the non-arts-based middle school students. Assessment data from the grade nine through twelve 2008 Gateway Test scores of the graduates of Mt. Pleasant High School were compared to the test scores of seventy graduates from the other high schools in the county to determine any residual benefits from the arts-based educational middle school program. The overall research question was: Are patterns of improved academic achievement discernable following matriculation at an arts-based middle school?
Research Questions

The research questions posed at the inception of the study were:

1. Is there a significant difference in the trend over the three test periods as relates to the arts-based curriculum student group vs. the standard education curriculum student group?

2. Is there a significant difference among the two student groups on overall test scores?

3. Is there a significant difference between the standardized values of the three types of scores, (a) language arts, (b) mathematics, and (c) science, when averaged over the two independent student groups?

Limitations of the Study

The proposed study was limited in the following ways:

1. The study was limited to students enrolled in one county school system in middle Tennessee.

2. Weaknesses inherent in any causal-comparative, ex-post facto study mean generalizability of the findings is limited.

Definition of Terms

*Arts-based curriculum* – An academic curriculum that uses the arts as the basis for student learning whereby students study the many art forms intensively so that through the arts, they can learn other core academic subjects (Davis, 1999).

*Arts integration* – Arts integration involves combining the arts curriculum with the academic curriculum (Sautter, 1994). It includes planning, incorporating, and
teaching art, dance, drama, and music with the core subjects of language arts, math, science, and social studies (Cornett, 1999).

*Arts-integrated school* – An arts-integrated school seeks to inspire and instruct students by integrating the many art forms into all areas of the curriculum in order to make learning coherent (Sautter, 1994).

*Gateway Test* – On October 29, 1998, the Tennessee State Board of Education designated high school courses for the development of end of course examinations. These examinations, called Gateway Tests, were intended to raise the academic bar for all high school students and add accountability for students’ academic performance. The Gateway Tests are administered three times annually (TDOE, 2001).

*Magnet school* – A magnet school is a public school that offers specialized courses or curricula. The use of the word magnet refers to magnet schools drawing students from across normal boundaries defined by authorities (usually school boards) as school zones that feed into certain schools. An arts magnet school allows students the opportunity to work with many art forms and to learn at least one of them well (Sautter, 1994).

*Tennessee Comprehensive Assessment Program (TCAP)* – The Tennessee Comprehensive Assessment Program (TCAP) is the standardized testing program used in public schools in Tennessee. The TCAP test is a timed, multiple-choice assessment that measures skills in reading/language arts, mathematics, science, and social studies. This test was previously known as the Terra Nova test (TDOE, 2001).

*The Arts* – The Arts includes visual art, music, theater, and dance (Artflex, 2007).
Zone – A distinctive area reserved for special purposes (*Webster’s New Dictionary of the English Language, 2002*).
CHAPTER II

REVIEW OF THE LITERATURE

A review of related literature establishes the context for the present study. To better understand the impact of the arts on academics, the following discussion is provided. The categories explored are art and human development (evolution), the history of art education, aspects of art curriculum in public schools, and research into the relationship between the arts and academic achievement.

Art and Human Development (Evolution)

The human species has had an evolutionary history of about four million years. The history of art is coupled with the recorded evidence of human events (Janson & Janson, 2004). Human history and the history of art began about 10,000 B.C. One of the earliest human artistic endeavors was to shape tools more than was functionally necessary (Dissanayake, 1988). In the prehistoric period, art was a crucial element of culture and of the quality of life (Anati, 1999).

The greatest art, just as the greatest culture, is the heritage of all. The arts help explain meaning, truth, spirit, social values, religion, and other foundations of human culture (Anderson, 1995). Culture expanded along with the evolution of the human species, Homo sapiens, and shares a close relationship to human biology (MSN Encarta, n.d.). In the biological sense, a culture is a place for growing things. Metaphorically speaking, schools are cultures for the growth of minds, bodies, and spirits (Geoghegan,
According to MSN *Encarta* (n.d.), a people’s culture comprises their beliefs, rules of behavior, language, rituals, art, technology, styles of dress, methods of producing and preparing food, religion, and political and economic systems.

In early history, the arts were not viewed as separate disciplines, such as dance, painting, and music, but rather as integrated with each other and with life. The arts were objects and performance combined with rituals and customs that identified the beliefs and values of a society’s culture (Anderson, 1995). Art from all historical periods reveals insights about man’s thoughts, his imagination, and his perceptions of the world (Anati, 1999).

A natural relationship exists among aesthetics, science, and philosophy that recognizes the equal contributions of each without forcing them to compete with each other to be the final authority. Science provides verifiable knowledge; philosophy presents a system of meaning for comprehending the universe; and aesthetics leads to understanding human experience and gives life its strength, depth, significance, and hope (Wintermute, 2006). The arts were deemed a vital and integral part of society (Anderson, 1995). They served a function beyond their aesthetic forms; they served integrated survival functions (Dissanayake, 1988). Dissanayake argued that the arts clarify and strengthen social relationships; bring awareness and clarity to society’s history, traditions, and values; provide attraction to mates; and establish relationship and hierarchy in societal cultures.
History of Art Education

Visual representation was essential to peoples of the prehistoric era (Addiss & Erickson, 1993). The discoveries of more than ten thousand paintings in over two hundred caves confirm that importance. The earliest evidence of toolmaking was two million years ago. During the Stone Age, the Paleolithic period (40,000 to 8,000 B.C.), humans improved upon tools when they connected form and function (Janson & Janson, 2004). The most prominent works of Paleolithic art were the images of animals carved, painted, or sculptured on the rock surfaces of caves. In addition to large-scale cave art, hand-sized drawings and carvings in bone, horn, or stone were made by people in the Paleolithic period (Janson & Janson, 2004). Later, tools of greater refinement and beauty and clay vessels covered with abstract patterns were created.

As long as the arts have existed, every culture has developed ways to select and prepare individuals to educate for roles in the arts. Throughout the history of art education, access to instruction was affected by social class, gender, and the status of the arts as a subject for study (Efland, 1990). Throughout the decades, issues of morality and social class have been associated with teaching art history and art appreciation (Addiss & Erickson, 1993). The Greeks influenced the Western origins of art education. Although the arts were respected during the Classical Era, they were regarded as unworthy professions for the children of wealth or social power (Efland, 1990). After the fall of Rome in A.D. 476, while agriculture remained the principal economic activity, activity in the visual arts, trade, and travel declined. Except for some elements of pagan culture
preserved by the monks and scribes, learning itself entered a period of decline as well (Efland, 1990).

By the end of the eleventh century, during the high Middle Ages, the development of trade resulted in the expansion of new institutions known as craft guilds, the apprenticeship system, and workshop treatises. These institutions became an important component of education (Efland, 1990). Guilds brought persons working in the same trade together and established their rights with regard to each other and their patrons. The guilds also controlled the labor supply by limiting the number of apprentices who could be taught and those who could teach. In the treatises, written collections of knowledge that dealt with the problems in the production of objects were prepared by craftsmen (Efland, 1990).

The severance of the fine arts from the crafts during the Italian Renaissance had profound effects for art education. During this period aesthetic education was stressed in the new classical secondary schools. Art education in the Renaissance witnessed the birth of academies - places where knowledge of artistic theory and knowledge of the science of art could be developed by teachers and students working together (Efland, 1990).

During the Enlightenment, technological improvements spurred the Industrial Revolution (Efland, 1990). Efland reported that new academies and art schools were founded for economic reasons. The common school movement, state-supported schooling, met the needs of an industrial society and was seen as a resolution to poverty and criminal behavior in the industrial cities (Efland, 1990). The integration of art into
other subjects was an attempt to reorganize the curriculum around realistic life situations. In the nineteenth century, art history was associated with moral education, and it was the privileged people who had access to the moral lessons taught in American universities (Addiss & Erickson, 1993). Working-class people were introduced to art history through drawing classes.

Art education was first introduced widely into the schools in the United States due to an interest in German, Swiss, and British methods (Macdonald, 1970). This interest was stimulated by Horace Mann (1796-1859) whose enthusiasm for the German system of education prompted the teaching of drawing courses in America. In 1848, Mann introduced drawing into the Massachusetts grammar schools, and in 1864 drawing was made compulsory in grammar grades in Boston. According to Macdonald, drawing was required in all common schools in Massachusetts in 1871. By 1873, the Massachusetts State Normal Art School in Boston was established for the purpose of qualifying teachers and masters of industrial drawing (Macdonald, 1970).

The role of the arts in education has had a turbulent history (Berube, 1999). During progressive reform eras, the status of the arts in the curriculum improved; conversely, during back-to-basics movements, its status diminished (Oreck, 2004). In the late nineteenth and early twentieth centuries, art history was deemed beneficial to moral and social development (Addiss & Erickson, 1993). From the 1920s through the 1940s, art educators endorsed a broader base for art appreciation. In the 1930s, classroom teachers were encouraged to use art in combination with the core curriculum (Brewer, 2002). Before World War II, music, theater, dance, and the visual arts thrived in the
school curriculum (Walling, 2001). Many of the New Deal projects focused on the arts, which prompted schools to be involved in arts education. However, during the war, education priorities shifted, as did the government support of the arts (Walling, 2001). After World War II, the now-culturally-matured American criticized integrated art curriculum for its subservient role to other subjects (Efland, 1990). Specific art study was viewed as having no value of its own. The intense focus on psychological development and creativity during the 1940s through the 1960s discouraged the teaching of art history as part of art education (Addiss & Erickson, 1993).

Art appreciation and cultural issues in art education were incorporated into the curriculum of some schools in the 1940s through the 1960s (Addiss & Erickson, 1993). A child-centered approach dominated art education. Victor Lowenfeld initiated an interest in the psychological and developmental value of art activities (Addiss & Erickson, 1993). Lowenfeld’s philosophy of art education focused on the ability of art activities to increase children’s creativity and facilitate their development. As a compelling advocate for the therapeutic value of art activities, Lowenfeld set an explicit goal to foster the growth and development of students without adult influence.

A back-to-basics approach, a counterrevolution against progressive education, occurred after the Soviet Union launched Sputnik in 1957 at the height of the Cold War (Berube, 1999). The emphasis in American schools shifted toward math and science (Walling, 2001). According to Berube, the arts were the first part of the curriculum to be removed from public schools because they were considered an education extra. During
the Great Society of the 1960s, the arts were once again included into the school curriculum. However, this time arts programs were simply add-ons to the curriculum.

Science provided the model for school curriculum and the definition of a discipline (Efland, 1990). A hierarchy of disciplines was acknowledged, which raised some studies to the status of disciplines and reduced others to the status of basic subjects. Due to this new environment, the arts had to become disciplines or lose their validity. The influence of science on the arts was evident when President Kennedy added a panel on educational research and development to the Science Advisory Committee in 1961 (Efland, 1990). The Arts in Education movement considered the arts an experience, not a discipline. The arts-in-education programs were interdisciplinary, which suggested the use of the arts to teach other disciplines. The Arts in Education movement served as a reminder that the arts belonged in the schools and that they were neglected subjects in the curriculum (Efland, 1990).

The emphasis on science and technology led to an inequality between the arts and other disciplines. This, in turn, led to the creation of Project Zero in 1967 (Floyd, 2007). Project Zero, founded and directed by philosopher of art Nelson Goodman, is a research group housed at The Harvard Graduate School of Education. Project Zero’s mission is basic research on artistic knowledge and practice. Howard Gardner served as co-director of Project Zero from 1972 until 2000. Gardner (1983) developed his theory of multiple intelligences which challenged the psychological view of intelligence as a single capacity that drives logical and mathematical thought.
The passage of the 1965 Elementary and Secondary Education Act (ESEA) provided funding for arts programs. Federal funding policy moved toward social programs such as the Arts and Humanities Program of the U.S. Office of Education headed by Kathryn Bloom (Efland, 1990). This program was eliminated during the height of the Vietnam War. In a 1962 article, Manuel Barkan argued for a refocus on works of art; he called for renewed attention to the development of instructional materials for teaching art history and criticism (Addiss & Erickson, 1993).

Between 1967 and 1979, the Arts in Education Program of the JDR 3rd Fund was committed to public schooling. Efland (1990) reported that The University City Project was the first funded project. The idea of integrating the arts into the curriculum of the University School District was the primary purpose of the project. During the course of the project, new art and music electives were added, fourteen arts-related instructional units were utilized in the classrooms, seventy percent of all high school students enrolled in one or more arts classes, and there was a proposal for an arts-based high school. In 1972, however, the program lost its leadership and any further progression (Efland, 1990). During the 1970s, the energy crisis forced cutbacks in educational programs and facilities (Walling, 2001).

The Accountability Movement in educational programs, including art education, which emphasized the writing of behavioral objectives, was common throughout the 1970s (Efland, 1990). The behavioral objectives served as a means for classifying various observable behaviors which could be used in the planning and evaluation of art instruction. By the mid-1970s, qualitative research and inquiry became established ways
of evaluating educational achievements (Efland, 1990). Qualitative research in art education reminded evaluators of instruction that the evaluation of art is complicated by the naturally indeterminate nature of its subject matter. The discipline-centered curriculum ideas of the 1960s and the discipline-based approaches during the 1980s supported the teaching of art history as a major component of art education (Addiss & Erickson, 1993). The National Art Education Association set as its first goal the creation of art programs that incorporated the study of aesthetics, art criticism, art history, and studio art (Addiss & Erickson, 1993).

The Excellence Movement was prompted by rising economic competition in world markets (Efland, 1990). In 1983 the J. Paul Getty Trust established The Getty Center for Education in the Arts. The Getty Center for Education in the Arts supported a comprehensive approach to teaching art, called discipline-based art education (DBAE), which emphasized the study of art production, art criticism, art history, and aesthetics (Addiss & Erickson, 1993). W. Dwaine Greer, who originated the term discipline-based art education (DBAE), headed a series of summer institutes to help classroom teachers teach art to elementary school children. The current excellence in education reform movement did not assign the arts a place in its standards and core curricula (Berube, 1999). For example, A Nation at Risk: The Imperative for Educational Reform (1983) did not mention the arts in the core curricula. The arts were not addressed in the national goals established during President George Bush’s administration in 1989. However, the Clinton administration desired to place the arts in the National Standards Core Curricula. In President Clinton’s Goals 2000 bill, the word art was added to the list of challenging
subject matter in which students should demonstrate competency. Voluntary standards on teaching in the arts were added to the core in 1994. The goal of the voluntary standards in the arts was the development of a knowledge base among the four arts disciplines – dance, music, theater, and visual arts (Berube, 1999). There have been efforts to include the arts in the official statement of goals which focuses on things that are manageable, predictable, and measurable (Greene, 1995). In reality, the arts are included in the goals for their assistance in the development of higher-level skills, academic achievement, standards, and preparation for the workplace.

Aspects of Art Curriculum in Public Schools

The arts have battled to identify their role in the school curriculum. Schools’ curricular priorities altered the arts placement in the curriculum. Whereas the arts were once on the edge of the curriculum, they are now at the center (Walling, 2001). According to Walling, in the late 1970s, five influences brought the arts back to the center of the curriculum. These influences included national goals and standards, discipline-based art education (DBAE), postmodernism, constructivist teaching, and technology.

After the inclusion of the arts as a goal in President Clinton’s Goals 2000 bill, complementary national standards were established (Walling, 2001). The standards were discipline-specific to dance, music, theater, and the visual arts. There were six to nine standards in each field as well as across sets of grades (K-4, 5-8, and 9-12). One standard was common to all arts disciplines: The student understands connections among various art forms and other disciplines (Walling, 2001).
Discipline-based art education, a theory that emerged in the early 1980s, proposed that art education focus on four art disciplines: art history, art criticism, aesthetics, and art making (Walling, 2001). During this decade, art education was extended through interdisciplinary studies. In the postmodern period, sociocultural differences, cultural particulars, and the irregular were valued rather than linear progress. The postmodern perspective changed the “what” of the art curriculum (Walling, 2001). There was a shift in instruction from a behaviorist model of teaching to a constructivist model, which coincided with the development of the DBAE theory and the postmodern period. Constructivist teaching stressed the idea of teaching for an understanding of the fundamental structures (Walling, 2001). Technology had always affected the study of art. In order for technology to be transformative, the computer was used to create and manipulate images and to investigate the visual arts. This use involved art making, art history, art criticism, and aesthetics; all were components of the DBAE theory (Walling, 2001).

The arts function as a medium through which people react to, record, and share their impressions of the world (Fowler, 1994). While mathematics and the sciences provide quantitative measures, the arts explore personal reactions. Both views are valid and contribute to understanding. Fowler believes that mathematics, science, history, and the arts convey only part of the reality of the world. A variety of symbol systems is required to provide a more complete picture and a more comprehensive education. The arts complement the sciences because they teach divergent rather than convergent thinking. According to Fowler, the purpose of the arts is not to convey data but to
provide meaning. The arts are valued for their interdisciplinary potential to produce a more cohesive curriculum in which students explore relationships across disciplines. The role of the arts is to enrich the curriculum by extending awareness and comprehension while confirming the interconnectedness of all forms of knowing (Fowler, 1994).

The arts are at the heart of human experience; however, the arts struggle to secure a place in the schools’ curricula (Davis, 1999). The arts are introduced into children’s lives in many ways. Davis identified eight types of curricular models for the arts in Education: arts based, arts infused, arts included, arts expansion, arts professional, arts extra, aesthetic education, and arts cultura.

With an arts based structure, the arts are studied intensively in order to facilitate general learning in all other content areas. The arts infused structure instills the arts into the educational setting in an effort to enrich student learning. In the arts included structure, the arts are offered together with non-arts courses within the curriculum and they are included in course offerings as their own disciplines. The arts extend education beyond the physical confines of the school into the larger community in the arts expansion structure. Students with recognized talent often enter the arts professional setting where the development of artists is regarded as the object of education. However, the arts structure most frequently found in today’s schools is arts extras. In this way, the arts are viewed as extras that are set aside from the daily curriculum. Viewed as extras, the arts are more easily omitted in times of stress and limited resources (Davis, 1999).

Alternatively, in aesthetic education, the arts are viewed as ways of knowing (Davis, 1999). Aesthetic education includes a more philosophical study whereby
students acquire skills of interpretation. The arts cultura model is based on the premise that the arts give form to and connect the cultures of individuals with mankind. The circular continuum of the arts cultura model exemplifies the view that the arts give form to a scope of perceptions and manifestations of culture. In this model, the arts allow individuals to experience and comprehend the various differences in humanity and the universality of those differences. The implementation of the arts cultura model begins with the cultures represented within a school’s own setting for subject matter relevant to a diversified curriculum and population (Davis, 1999).

R. A. Smith (2002) described four phases of aesthetic learning which included an emphasis on creative activities in the early phases and the historical, cultural, and philosophical aspects of discipline-based arts education (DBAE) in the latter. During the first phase of aesthetic learning (kindergarten through grade three), a basic sense of art is developed, and a young child’s tendency to delight in the sensory quality of things is developed. This first stage builds on a child’s previous knowledge and establishes the need for more formal instruction. According to Smith, aesthetic instruction becomes more narrowly focused in phase two of aesthetic learning (grades 4-6). Attention is directed toward various ways of considering works of art. Young people develop the ability to observe, recognize, and form an impression of the various aspects of artworks. The third phase of aesthetic learning (grades 7-9) is the development of a sense of art history that includes multicultural and global considerations. During the final stage of aesthetic learning, young persons in grades 10-12 engage works of art in some depth
(Smith, 2002). According to Smith, toward the end of phase four of aesthetic learning, students form a basic philosophy of art.

The Armory Center for the Arts, in partnership with the Pasadena Unified School District and the California Institute of Technology, developed Project FLARE (Fun with Language, Art, and Reading) to increase students’ mastery of language and visual arts, understanding of diverse cultures, and knowledge and appreciation of the arts (Aschbacher, 1996). In Project FLARE, teacher-artist teams developed an integrated curriculum of language arts and visual arts, incorporating art projects into classroom curriculum, instruction, and assessment. Lessons were based on appropriate curriculum and core literature, the teacher’s and artist’s backgrounds and interests, and the individual interests and needs of the students. According to Aschbacher, artists and teachers attended numerous training sessions on language development, integration of language arts and visual arts curriculum, portfolio assessment, and thematic unit planning. A teacher-artist team met and outlined three unit themes and planned supplementary activities for the school semester, coordinated their areas of responsibility, discussed student progress, shared new ideas, and planned future activities. Teachers and artists also worked to gain access for students to art performances and gallery shows. An evaluation of Project FLARE documented beneficial effects on students such as increased awareness and appreciation of the arts, growth in expressiveness, and a broadened cultural understanding of themselves and others (Aschbacher, 1996).

Arts instruction in K-12 schools in which students receive their education in diverse settings, formats, and organizing principles, is provided along with a core
curriculum of other subjects and can be as varied as the settings themselves (Gratto, 2002). From March 1999 through January 2002, Gratto studied successful arts programs in a selection of schools with alternative formats and raised issues about schools with alternative formats. The selected schools - five charter schools, three cluster arts magnet schools, three residential schools, four public urban arts magnet schools, and three schools within schools - were distinguished because of their experimental and practical approach to offering arts education to students. Gratto reported that students in the selected schools achieved higher scores on standardized tests, and many transferred successfully from these schools to colleges and universities with excellent arts programs, or directly into performance or performance-related fields.

The structure of arts assessment and the expected outcomes and standards shape arts education (Wilson, 1996). According to Wilson, there are ninety-seven achievement standards for dance, one hundred ten for music, eighty-six for theatre, and fifty-seven for the visual arts in the National Standards for Arts Education (grades K-12). Such an assessment of arts performance accrues a collection of fragments, makes art instruction and art assessment complicated, and makes the outcomes difficult to understand (Wilson, 1996). Instead, Wilson proposed a strategy that assessed outcomes of many arts standards simultaneously and provided a rationale for how the arts educate. The principal goal for arts education is for students to acquire special knowledge of themselves, others, norms, and works of art. This goal for arts education is achieved through the Discipline-Based Arts Educational initiative (DBAE). The greatest challenge faced by arts educators and evaluators is the acquisition of valid information about the extent to which
students understand the ideas associated with the arts and the way the arts affect their lives (Wilson, 1996).

According to Gratto (2002), a criteria for best practices in arts instruction emerged from the examination of arts programs in schools with alternative formats. He found that creative leadership was foremost in importance and that the individual leader must have a vision of the value of the arts education and an understanding of how an arts program should be organized and maintained. Gratto confirmed that the administrators in the school districts he studied did not view their arts programs as financial deficits, but rather used their energies to protect their programs from political and financial threats in order to ensure their continuation. Gratto acknowledged that schools with alternative formats recruited students who sought preprofessional training and those who simply desired an in-depth arts experience. He saw schools with alternative formats staffed by a combination of professionally experienced and active artist-teachers, traditionally certified arts teachers, and teachers in other disciplines who were supportive of the arts curriculum and concluded that schools with alternative formats had flexibility in length of school days. Arts prospered in schools with alternative formats and excellence in arts education added significantly to a school’s success (Gratto, 2002).

An arts-integrated school challenges students and increases learning through individual art forms and interdisciplinary, hands-on projects (Sautter, 1994). Arts-integrated schools encourage students to learn in as many artistic and creative ways as they can imagine. Arts-integrated schools increase the amount of instruction in the individual art forms and integrate all the arts into the core subjects. Also, direct
involvement in the various art forms increases students’ expression skills, human history, and cultural knowledge. The arts serve as a means of helping learners acquire knowledge in interdisciplinary ways (Sautter, 1994).

Sautter (1994) stated that while an arts-integrated school exposes students to all the art forms, intensive instruction is given in the art form in which an individual student is most interested. An arts-integrated school uses the arts as a means to link all areas of the curriculum and to make learning a coherent experience that makes sense to students. An arts-integrated school advances reform in the formal learning curriculum, the metacurriculum, and the hidden curriculum (Sautter, 1994). Since the creation of the National Endowment for the Arts by President Kennedy in 1960, research into the benefits of arts-integrated projects has shown an improvement in academic skills in the formal curriculum on reading, writing, social science, math, and science. At the core of the arts-integrated school is the support of the metacurriculum which includes creativity, imagination, critical thinking, and unique methods of oral and written expression. In an effort to direct student learning and to measure student growth and development through such strategies as hands-on involvement, individualized instruction, positive reinforcement, and the provision of a quality arts environment, the arts-integrated school uses the hidden curriculum of social behavior to improve self-discipline, self-motivation, self-esteem, and social interaction (Sautter, 1994).

A growing number of public school districts across the United States use an arts-based design whereby the arts are used as pathways for learning within all academic disciplines (Ottey, 1996). Dance is recognized as an art form that employs all seven of
Howard Gardner’s proposed multiple intelligences. The challenge for dance educators is achieving a balance between teaching dance as an art and using dance as an integral tool for teaching (Ottey, 1996).

Ottey (1996) suggested four vital steps for the inclusion of dance in an arts-based public school. The first is an examination of multiple resources that address trends in educational theory. The expansion of these resources to develop personal values and professional philosophies within the discipline follows step one. The implementation of meaningful, engaging classroom practices and innovative assessment measures complete the four-step process, the purpose of which is to expose dance educators to the critical pedagogical theory (CPT) of curriculum development and connect the CPT to the National Standards for Dance Education Framework (Ottey, 1996).

Within the critical pedagogical theory (CPT), the student and teacher actively create and critique knowledge (Ottey, 1996). The educator is a facilitator who provides opportunities for building connections between the student, teacher, academic content, school environment, and community. Using the National Standards for Dance, which value critical analysis as a major component in dance programs, as a foundation and CPT as a guide to knowledge exploration, dance educators can develop beneficial and empowering pedagogy. Dance educators must critically engage the creation and performance of art while implementing their teaching methodologies through an understanding of the various ways in which students learn. Dance educators must use dance as a tool for learning through one domain to convey learning in another. Dance educators need to rely on collaborations that examine the commonalities between arts
educators and core subject educators thereby discovering ways to correlate dance with content taught in other disciplines. Because multiple methods of evaluation increase an educator’s ability to assess student learning, dance educators should possess an awareness of the creative levels of student achievement, the relationship of student-teacher dialogue that influences the achievement level, and the project and process methods of evaluation (Ottey, 1996).

Uhrmacher and Moroye (2007) presented four approaches to arts education: discipline-based, interdisciplinary, utilitarian, and transformational art education. The utilitarian approach to art education uses art as a tool to increase learning in other subject matter such as reading, math, or science. The goal of this approach is to help students read better, earn higher math scores, and understand the nature and the world around them. In the utilitarian approach, art is not used for its main purpose; it is used to aid non-arts areas. However, in the discipline-based art education model, art is taught for arts’ sake - art history, critique, art production, and aesthetics. In an interdisciplinary approach, each subject (math, science, art) is equal. The various disciplines are included under broad themes, and each area contributes to the overall understanding of the broad theme. Finally, in the transformational approach, education is transformed from aesthetic and artistic perspectives. The goal of this approach is not to change curriculum, but to change the person.

Uhrmacher and Moroye (2007) argue that each of the four approaches to art education affects and is affected by the nature of the classrooms and the schools. Art education affects the curriculum, pedagogy, school structure, evaluation, and school-
community relations. Curriculum is content, what is taught; pedagogy refers to the method used to teach the content. School structure includes the time and space in which learning occurs. Evaluation refers to formal and informal ways of assessment. Finally, school-community relations address the impact that the community has upon the classroom and school activities (Uhrmacher & Moroye, 2007).

A school principal often facilitates the implementation of the school curriculum and evaluates its ability to meet educational goals (Abril & Gault, 2006). In order for elementary music educators to gain support from school principals, an understanding of the learning outcomes and curricular goals is essential. Abril and Gault investigated principals’ perceptions of the elementary music curriculum. The researchers sought to ascertain principals’ perceptions of music learning outcomes as they were currently being met and as they should ideally be met. Results indicated a moderately positive relationship in which increases in current conditions were complemented by increases in ideal conditions. The outcomes maintained that principals believed music programs at their schools were meeting music education standards (Abril & Gault, 2006). The outcomes were even higher when measuring them in ideal situations, indicating that principals placed high value on these standards. According to Abril and Gault, based on the difference between conditions with regard to music in relation to history and culture, principals valued the ways music connected with other subjects such as writing, history, and multicultural studies. Ninety-two percent of the principals surveyed reported that music education was a required component of the elementary school curriculum (Abril & Gault, 2006).
McKean (2002) evaluated three fifth grade social studies textbook series (Harcourt Brace, Houghton Mifflin, and Macmillan/McGraw-Hill) for the distribution of artistic forms of representation and the social studies content with which those representations were aligned. The objective of social studies education is to increase civic competency and promote a broad understanding of the social and physical world in which students live. The three textbook series were selected based on the amount of use by school districts and the textbook’s emphasis on integrating the arts (McKean, 2002). In addition to chapters of expository text, fifth grade textbooks contained collections of historical fiction, graphs and charts, maps, timelines, reproductions of paintings, photographs, sheet music, and suggestions for activities that encouraged students to write plays, describe and construe works of art, create murals, or role-play historical events. McKean examined the methods by which artistic disciplines were represented, the pedagogical principles associated with the representations, and the potential of the representations for teaching social studies.

McKean (2002) assessed the methods by which artistic disciplines were represented through the use of visual art, music, drama/theatre, and dance. Visual art comprised eighty-five percent of the artistic references. Further, drama accounted for ten percent, and music accounted for five percent. Only one reference was made to dance. The three textbook series centered on the history of the United States; therefore, many of the artistic representations contained history or government content. McKean evaluated the pedagogical principles used within the textbooks through the central activities of the arts - perceiving, responding, and creating. In the three series, opportunities for
perceiving and responding occurred thirty-four percent of the time. McKean further found that the three textbook series did not provide information to assist teachers and students with the critical skill for inquiry in the social sciences and the arts. Opportunities for creating art occurred thirty-eight percent of the time. Again, McKean found a lack of information about the techniques and principles of composition in the arts that limited the activities in which the teachers and students could create art.

McKean (2002) provided possible solutions to the lack of information in the three textbook series. McKean offered that more preparation in artistic knowledge and social studies education skills be provided to teachers. The author further recommended that teachers be given opportunities to engage in the arts themselves. Finally, McKean suggested that in-service training and advanced methods courses in art and social studies concentrate on artistic information and background.

One difficulty in general education is to find the most appropriate common curriculum to meet the needs of students and honor their individuality while also serving the democratic needs of society (Walker & Soltis, 1997). Every democratic society attempts to provide some form of universal education for all its members. No one can know what qualities a child may have nor what way of life they will follow. Therefore, the education and curriculum offered must prepare all children to become equal contributing members in a society in which they will have a future of endless possibilities (Walker & Soltis, 1997).
Research on the Relationship Between the Arts and Academic Achievement

In a review of the research on the relationship between the arts and academic achievement, several studies (Bitz, 2004; Eisner, 1999; Hetland & Winner, 2001; Wright, 2007) identified an increase in academic improvement. Conversely, some studies (Butzlaff, 2000; Graham, Parker, Wilkins, Fraser, Westfall, & Tembo, 2002; Winner & Cooper, 2000) found that the arts had no effect on academic improvement. A few studies (Hetland, 2000; Winner & Cooper, 2000; Winner & Hetland, 2000) reported mixed findings on the relationship between the arts and academic achievement.

Positive Effects of the Arts on Academic Achievement

The value of a field increases when a body of work in that particular field of study makes important and valuable contributions to a wide range of skills, inclinations, or understandings (Eisner, 1999). In a review of the research on the relationship between arts courses and academic achievement, Eisner examined literature published from 1986 to 1996. The review included experimental studies that described the relations between arts and academic achievement, publications that presented the actual studies, and studies published in referred journals. Eisner examined the research basis for claims about the effects of art experience on academic achievement. There were some effects, but they were very limited. The effects of the arts appeared to be greatest when the arts were deliberately used to raise academic achievement in reading and writing (Eisner, 1999).

The Learning In and Through the Arts, a two-year study by Burton et al. (1999), examined the artistic experiences of over two thousand elementary and middle school students. The goals of the study were to ascertain the development of cognitive, social,
and personal skills through arts learning, the general effect these competencies have on learning, and the degree to which school conditions support this learning. Several measures were used in the study: pupil and teacher opinion inventories, the Torrance Test of Creative Thinking, the Self-Description Questionnaire, a Teacher Perception Scale, the Classroom Teacher Arts Inventory, and the Student Arts Background Questionnaire. The study looked at the number of years a student received in-school arts instruction and the variety of different arts studied (Burton et al., 1999).

Results of the Burton et al. (1999) study showed that students assigned to the high-arts group repeatedly outperformed the low-arts group on measures of creative thinking and teachers’ perceptions of artistic abilities. Students in the high-arts group scored well on measures of creativity, fluency, originality, elaboration, and resistance to closure. In addition, the high-arts group scored higher in terms of academic teachers’ perceptions of their general abilities. Students in the high-arts group were stronger than those in the low-arts group in their ability to express their thoughts and ideas, use their imagination, take risks in their learning, cooperate, and display their learning. High-arts students viewed themselves as academically competent and were far more likely to believe they did well in school in general, particularly in language and mathematics, than did the low-arts students. Burton et al. further suggested that students in the high-arts group had better rapport with their teachers. The study indicated that the relationship between learning in the arts and in other subjects is dynamic and interactive due to the existence of higher order thinking in both arts learning and learning in other subjects. That is, the higher order thinking and personal qualities necessary for academic success
were strengthened in high-arts schools when students had studied several arts over time. The negative correlations between low-arts schools and all cognitive and personal aspects of the study strengthened this conclusion (Burton et al., 1999).

Catterall et al. (1999) explored connections between the arts and human development and achievement. The first phase of this research examined general involvement in the arts across all disciplines. The analyses found substantial and significant differences in achievement and in attitudes and behaviors between eighth through twelfth grade students highly involved in the arts and those with little or no arts involvement (Catterall et al., 1999). Significant achievement differences were found between high-arts students and low-arts students among economically disadvantaged students. Catterall et al. reported that twenty of the differences were significant at the $p < .001$ level for arts-involved students. The only area of comparison not showing a statistically significant difference was in performance on the history geography tests for low socio-economic status (SES) students. Comparisons of high-arts and low-arts students showed consistently more favorable outcomes – higher achievement, staying in school, and better attitudes about school and community – for students involved in the arts (Catterall et al., 1999). Arts-involved students scored comparatively better on multiple test measures, and their performance advantages increased over time from grades eight to twelve. These performance comparisons also held true for low SES students (Catterall et al., 1999).

Catterall et al. (1999) extended their research focus to include a study of students who exhibited very high levels of involvement within a single arts discipline during the
secondary school years. Students who concentrated in instrumental music performed substantially better in mathematics than those with no involvement in music. Further, all high SES students in the high music group and no music group performed better in mathematics than the average student. Finally, low SES students with high music involvement performed better than the average student at achieving high levels of mathematics proficiency (Catterall et al., 1999).

Catterall et al. (1999) also reported on another intensive involvement in a single artistic discipline, the theater arts, and examined the progression of reading skills for two groups of low SES students beginning in grade eight. One group had no involvement in theater, and the other group was highly involved in theater (Catterall et al., 1999). The involved students outscored the non-involved students; both groups gained skills as they proceeded through high school; and the difference favoring students involved in theater grew steadily to where nearly twenty percent more were reading at high proficiency by grade twelve (Catterall et al., 1999).

Heath and Roach (1999) reported empirical data results from a ten-year study of youth-based organizations devoted to production and performance in the arts and their impact on learning and language development. Effective youth arts-based organizations required young people to produce numerous types of writing as well as oral performances of organizational genres (Heath & Roach, 1999). Heath and Roach further explained that arts-based youth organizations placed a strong emphasis on communication skills and fluency and facility with varieties of oral performances, literacies, and media projections. Findings from the study revealed that students who did not attend organized non-school
activities and who were not notably involved in extracurricular activities at school, engaged in only fifteen to twenty minutes of interaction with adults in sustained conversation (at least seven minutes in duration) each week. Heath and Roach reported that youth not involved in non-school activities received almost no practice in discussing future plans, developing ideas for implementation, and evaluating future steps. That is, young people in arts-based organizations gained practice in thinking and talking as adults (Heath & Roach, 1999).

The influences of arts participation on language emerged in the dramatic increase in syntactic complexity, hypothetical reasoning, and questioning approaches employed by young people within four to six weeks of their entry into the arts organization (Heath & Roach, 1999). The initial data analysis of the 750,000 words transcribed from the arts-based organization showed that the linguistic skills of these youth included a five-fold increase in the use of if-then statements, more than a two-fold increase of mental state verbs, and a doubling in the number of modal verbs. The youth in arts-based organizations had six times as many opportunities to speak more than one sentence in each practice session as they had in their English or social studies classrooms. Furthermore, Heath and Roach stated, youth in arts-based organizations had nine times as many opportunities to write original text materials as their classroom peers.

Wolf (1999) presented qualitative research that provided a profound, conclusive understanding of what effects arts education programs have and why these effects occur. Wolf described a multi-year study of Creating Original Opera (COO), a program in
which elementary students form a company to write and produce an original opera. The qualitative data collection methods included the following: classroom observations, transcripts of teacher and student interviews, student ethnographies, activity logs, and student work collections (Wolf, 1999).

According to Wolf (1999), the data suggested that students in the opera setting participated in sustained and consistent collaboration. They worked more cohesively, connecting their own comments and responses to those of others and group issues. Wolf further reported that these results held true in three of the four classrooms studied. In the fourth classroom, the data from the opera setting was no different from that of non-opera settings. In addition, the Wolf study showed that collaborative interaction in the opera setting grew over time. Finally, students in the opera settings became skilled at active participation, quality work, and building on others’ ideas and issues (Wolf, 1999). Wolf concluded that students in the opera settings collaborated frequently and effectively. The findings suggest that arts education, particularly the work students do on their own operas, can be applied more broadly thereby contributing to learning in general. Students increase their understanding of meaning and the methods for conveying it to the work of others and are able to transfer that understanding (Wolf, 1999).

Two explanations why learning in the arts might generalize to learning in other disciplines include a cognitive structure and a motivational one according to Winner and Cooper (2000). They analyzed research that tested the claim that studying the arts correlates to improved academic achievement. The goal of the Winner and Cooper study
was to compare the comprehensive effects of correlational versus experimental studies using meta-analyses.

Winner and Cooper (2000) performed meta-analyses on correlational studies for composite, verbal, and mathematics outcomes. All three meta-analyses revealed a positive, significant relationship between arts education and academic achievement. Winner and Cooper confirmed that the assertion that studying the arts improves verbal and math achievement is consistent with the positive effect of the meta-analyses. However, since the effect sizes were based on correlational studies, the results do not prove that arts education causes improvement in academic achievement. The causal relationship that high academic achievers may choose to study the arts could not be ruled out (Winner & Cooper, 2000).

Vaughn and Winner (2000) analyzed twelve years of Scholastic Aptitude Test (SAT) data from 1987-1998, and examined the claim that students who study the arts in high school have higher SAT scores than those who do not study the arts. They compared the scores of students who specified having taken zero, one, two, three, and four years of arts courses. An analysis for composite, verbal, and math scores in order to conclude which score was more highly associated with arts study was conducted. All three analyses revealed the following: a significant effect of level of arts experience; a gradual increase with each level of arts experience from zero to three years and then a sharp increase at four years; scores of students with zero, one, two, three, and four years of arts experience were significantly lower than scores of students with four and over four years experience; scores increase linearly from zero to three years of arts experience; and
the mean scores of students with four and over four years of arts were not reliably different. Therefore, composite, verbal, and math scores increase linearly from zero to three years of arts experience, and then rise at four years (Vaughn & Winner, 2000).

Vaughn and Winner (2000) combined scores meta-analytically, once for verbal and once for math scores, and concluded that there was a significant relationship between higher verbal scores and taking four years of arts. Verbal scores across art forms were compared and those students who took at least one course in acting/play production attained the highest scores, and those students who took at least one course in dance attained the lowest scores. However, students who took no arts courses at all attained the lowest verbal scores. Vaughn and Winner compared math scores across art forms and found that those students who took at least one course in acting/play production or music history/theory/appreciation attained the highest scores, and those students who took at least one course in dance attained the lowest scores. However, they reported that students who took no arts courses at all attained the lowest math scores. The strongest relationship between score and type of arts course was obtained when the course was in acting; the lowest relationship was obtained when the course was in dance (Vaughn & Winner, 2000).

In addition, the verbal and math SAT scores of students taking any arts courses, regardless of the number of years, were significantly higher than for students who took no arts courses. No conclusion could be made that taking arts courses will result in higher SAT scores because the data was correlational and allowed no causal inference (Vaughn & Winner, 2000).
Drama proved to be an effective tool for increasing achievement in story understanding, reading achievement, reading readiness, and writing (Podlozny, 2000). In addition, drama not only helped children master the texts they enacted, but also helped them master new material not enacted. Podlozny conducted seven meta-analyses (from eighty eligible studies) which examined the effect of classroom drama on the following verbal outcomes: story understanding (oral), story understanding (written), reading achievement, reading readiness, oral language development, vocabulary, and writing.

Podlozny’s (2000) first meta-analysis examined seventeen studies that assessed the effect of drama on story understanding and recall as measured orally. In the treatment group, participants had a story read to them, and they were instructed to enact the story. The control group had the same story read to them; however, instead of acting out the story, the participants either had the story reread to them or they participated in discussion or drawing after hearing the story. At the conclusion of the treatment period, all participants took an oral story recall test. The mean effect size was $r = .27$ which produced a 95% confidence interval of $r = .16$ to $r = .34$. The results indicated that there was a relationship between classroom drama and oral story understanding and recall. Drama not only helped students understand and recall better the texts they enacted, but students were able to generalize their understanding of the enacted texts to their ability to understand new texts that they did not enact. Podlozny concluded that enacting one text made a new text more comprehensible which demonstrated the power of classroom drama to develop text comprehension skills that transfer to new material.
Podlozny’s (2000) second meta-analysis examined story understanding as measured by written tests. Both the treatment group and the control group participants read the same stories. The treatment group then enacted the story; the control group engaged in discussion and related vocabulary drills. All participants were tested on the story using experimenter-designed criterion-referenced tests created to measure story understanding. The mean effect size was $r = .47$ with a 95% confidence interval of $r = .37$ to $r = .73$. The results indicated that there was a relationship between classroom drama and story understanding as measured by written tests. Podlozny concluded that when students enact text, they process the stories more actively, which leads to greater comprehension of texts.

Podlozny (2000) conducted a third meta-analysis that examined reading achievement. The treatment and control groups were comprised of students in first through eleventh grade. Students in the treatment group participated in creative drama activities that included reading a story or play, discussing, performing, enacting the story, and discussing the results. Students in the control group utilized the basal reader in their regular reading classes, and did not read the story or play read by the students in the treatment group. The mean effect size was $r = .19$ with a 95% confidence interval of $r = .11$ to $r = .29$. Podlozny concluded that there was a relationship between drama instruction and reading achievement. Participants in the treatment group were actively engaged in the texts they read and physically involved in the process of deciphering
meaning from texts. The active, physical involvement transferred to some degree to
general reading ability. In addition, Podlozny reported that drama instruction was more
effective for low socio-economic students and remedial readers than for average students.

The fourth meta-analysis conducted by Podlozny (2000) examined eighteen
studies assessing the effects of drama instruction on the reading readiness of young
children. In the treatment group, participants heard a story, engaged in discussion, chose
or were assigned roles, and enacted the story. Participants in the control group heard the
same story as the treatment group. However, they engaged in discussion, re-enacted
themes from field trips or common experiences (no story), or participated in cut and paste
and categorizing activities. The mean effect size was $r = .24$ with a 95% confidence
interval of $r = .15$ to $r = .36$. Therefore, Podlozny concluded that there was a relationship
between drama instruction and reading readiness. In addition, unstructured drama, which
does not engage participants directly with story content and structure, was less effective
in promoting reading readiness than structured dramatic play that encouraged children to
explore within the confines of a particular story.

In the fifth meta-analysis, Podlozny (2000) examined twenty studies that assessed
the effects of drama instruction on oral language development in students from pre-
kindergarten through seventh grade. Both the treatment and control groups participated
in daily reading activities. The treatment group engaged in creative dramatics such as
storytelling, role-playing, puppetry, and discussion activities. The control group engaged
in creative art, music and rhythm, and viewed filmstrips. At the conclusion of the
treatment period, all participants were tested for oral language development. In addition,
the treatment group engaged in pantomime, improvisation, and dramatization of stories, while the control group received regular language arts instruction. At the conclusion of the treatment period, all participants gave a taped language sample about a picture presented by the researcher. The mean effect size was $r = .15$ with a 95% confidence interval of $r = .20$ to $r = .41$. Podlozny concluded that there was a relationship between drama instruction and oral language development. Drama instruction leads to enhanced oral language skills because drama encourages children to use language in diverse ways (Podlozny, 2000).

Podlozny’s (2000) sixth meta-analysis examined ten studies that assessed the effects of drama instruction on vocabulary achievement. Participants in the treatment group engaged in creative drama activities such as role-play, pantomime, movement and rhythm activities, and dialogue improvisation. The control group engaged in regular classroom activities. At the conclusion of the treatment period, a standardized test of vocabulary achievement was administered to all participants. The mean effect size was $r = .14$ with a 95% confidence interval of $r = -.07$ to $r = .37$. As participants became actively engaged with words during drama activities, it seemed reasonable that they would be more likely to remember the words and the meanings of the words they explored during drama. However, the meta-analysis revealed that the average effect size was small and could not be generalized to other studies. Podlozny concluded that there was no reliable relationship between drama instruction and vocabulary development.

A final meta-analysis by Podlozny (2000) examined eight studies that assessed the effects of drama instruction on writing achievement. The participants included
children in first through ninth grades. Participants in the treatment group engaged in a
discussion on the aspects of narrative writing, improvisation, pantomime, and movement
activities, and developed story ideas, role-played their ideas, improvised main scenes, and
drafted their stories. Students in the control group participated in a discussion on the
aspects of narrative writing but received regular language arts instruction before drafting
their stories. The narrative drafts were analyzed according to a narrative writing scale.
The average effect size was $r = .29$ with a 95% confidence interval of $r = .09$ to $r = .52$.
According to Podlozny, there was a relationship between drama instruction and writing
achievement. In addition, drama instruction to promote writing achievement was more
effective with younger children than with older children. Drama could be viewed as the
rehearsal for writing, which could provide for the integration and revision of ideas that
are crucial elements of the writing process (Podlozny, 2000).

Based on the results from the seven meta-analyses, Podlozny (2000) asserted that
drama instruction has a positive effect on various verbal outcomes. Therefore, drama is
an effective tool for increasing achievement in story understanding, reading achievement,
reading readiness, and writing. Additionally, drama not only helps children master the
texts they enact, but also helps them master new material not enacted (Podlozny, 2000).

The second meta-analysis by Burger and Winner (2000) tested the hypothesis that
an arts-integrated approach to reading worked better than a non-arts-integrated approach
to reading. The mean effect size of the studies was $r = .23$ with a 95% confidence
interval of $r = .03$ to $r = .45$, which does not span zero. However, the $t$-test of the mean
yielded a value of 2.003, which was not significant, $p = .14$. Burger and Winner
concluded that the results could not be generalized to new studies. The second meta-analysis revealed a positive, moderately-sized relationship between reading achievement and an arts-integrated approach to reading. Burger and Winner reported that art projects might be effective as an entry point into reading; however, on the basis of the small number of studies found, there is only marginal support for this claim.

Proponents of arts education continue to emphasize the influence the arts appear to have on children – increasing student performance, instilling discipline, promoting social empathy, and long-term audience development (Cameron, 2004). In one randomized control-group design used to assess the effect of a drama program on the reading comprehension section of the Iowa Test of Basic Skills (ITBS) with fourth grade students, Rose et al. (2000) found that drama-based instruction had significant impact on student learning in the area of reading comprehension. In addition to the ITBS assessment, a performance assessment was developed to measure improvement in reading comprehension and drama skills during the course of the ten-week study. Rose et al. found that the ITBS reading scores of the Reading Comprehension and Drama (RCD) students improved an average of three months more than students in the control group who did not participate in the drama program. The difference was statistically significant using pretest grade equivalence scores as the covariate in an ANOVA, $F(1, 154) = 7.87$, $p = .006$. In addition, these researchers recognized that the RCD students improved their Performance Assessment scores significantly compared with the control group students, $F(1, 147) = 10.9$, $p = .001$. This study demonstrated that the drama program appeared to significantly improve students’ overall reading comprehension (Rose et al., 2000).
The objectives of an arts integration project, Fine Arts and Literature-Based Curricula, at Elk City School in Idaho, were to integrate literary arts, visual arts, and music arts into the curriculum (Gould, 2000). Elk City School had an enrollment of eighty-five students in grades kindergarten through ten. Elk City School’s faculty and administration and an on-site facilitator designed the arts integration project. The project used a webbed integration design with an organizational framework of five thematic units in which to integrate the arts.

Responsive methodology was used for evaluating the study because it produced qualitative data that focused on program activities, provided necessary and relevant information, and included diverse points of view (Stake, 1975). Stake affirmed that the responsive methodology was structured in two phases: description and judgment. The description phase evaluated congruencies between intended and observed antecedents, transactions, and outcomes (Stake, 1975).

Gould (2000) explained that the Elk City School project’s antecedents (conditions that exist prior to a program’s existence) included employment of no arts specialists, lack of quality children’s literature, and low Iowa Test of Basic Skills (ITBS) and state writing assessment scores. The Elk City School project’s transactions (the composition of the program itself) included classroom teaching and staff and curriculum development with leadership provided by the project facilitator. The project’s outcomes (consequences of transactions) included centering the arts in the school’s physical building, the curricula, and the teaching methods employed (Gould, 2000). The Elk City School project produced increased writing assessment and ITBS scores, and the school was awarded
Title I Accelerated School status by the state department of education and partnership status by the state arts agency. Antecedents, transactions, and outcomes are congruent when what was observed matches what was intended (Stake, 1975).

Gould (2000) reported that the most notable outcome that was not contingent was improvement in students’ test scores. The judgment phase of responsive methodology compared Elk City School’s project to the National Standards for each artistic genre and the accepted standards represented by two exemplary projects with similar characteristics (Gould, 2000). The Elk City School project compared favorably to both exemplary projects but did not meet the standards outlined in the National Standards. According to Gould, the Elk City School Fine Arts and Literature-Based Curricula transformed both the environment and education of the school.

In response to the findings of the REAP report, Aprill (2001) affirmed that learning in one content area does not generate knowledge or skills in another area. He asserted that content areas are connected; however, that connection is not linear. Aprill stated that the connection is the interaction of and the translation between the arts and other content areas. This intervening between different areas of knowledge establishes the learning as authentic intellectual work. Authentic intellectual work requires students to engage in a wide range of representations and to express themselves in a variety of forms (Aprill, 2001). Aprill stated that the arts should be an important, integrated part of instruction that can authentically challenge students to fulfill their capabilities. Aprill’s research with the Chicago Arts Partnership in Education (CAPE) confirmed that the arts
do increase student achievement when the authentic connections between the arts and other content areas are recognized and developed.

Hetland and Winner (2001) conducted a meta analysis of research on art education and academic achievement. Their report, titled “Reviewing Education and the Arts Project (REAP) Report,” was the first comprehensive study of the research. Hetland and Winner obtained 188 reports that investigated the relationship between one or more arts to one or more academic areas. Using a total of 275 effect sizes, Hetland and Winner conducted a set of 10 meta-analyses and then used statistical analyses to determine whether the effect size would be generalized to new studies on the same research question. They found three areas in which reliable causal links could be demonstrated between the arts and academic achievement in non-arts areas. Based on twenty-six reports, a medium-sized causal relationship was found between listening to music and temporary improvement in spatial-temporal reasoning. Scientifically, this finding suggested that music and spatial reasoning were psychologically and neurologically related. A large causal relationship was found between learning to make music and spatial-temporal reasoning based on nineteen reports (Hetland & Winner, 2001). This finding was valuable because the effect worked equally for both the general and at-risk populations, costs little, and influenced many students. Hetland and Winner acknowledged that depending on how subjects are taught, spatial skills might or might not be of benefit to students. Finally, based on eighty reports, a causal relationship was found between classroom drama and a variety of verbal skills. Vocabulary had a small causal link; written understanding and recall of stories had a large causal link; and oral
understanding and recall of stories, reading readiness, reading achievement, oral language, and writing had medium-sized causal links. Apparently, drama not only helped children’s verbal skills with enacting texts, but it also helped children’s verbal skills when applied to new, non-enacted texts. Hetland and Winner concluded that drama helps to build verbal skills that transfer to new materials.

In urban areas of the United States, problems such as crime, poverty, and poor health correlate with illiteracy (Bitz, 2004). Bitz founded The Comic Book Project, an arts-based literacy program for youth in urban after-school programs. The three-month project involved over seven hundred children from thirty-three after-school sites in New York City. The students, fifth through eighth grade, were academically low-performing students, and more than half had limited English proficiency. The idea of connecting comic books to academic skills was not new (Bitz, 2004).

Bitz (2004) explained that a more complete connection between the arts and literacy is formed when children create their own comic books. The main goal of the project was to build literacy and artistic skills while motivating children to take ownership and pride in their work. The children brainstormed, outlined, sketched, wrote, and designed original comic books. The project focused on reading, writing, and vocabulary skills. In addition, it was designed to examine the social contexts of literacy, from a reading, writing, and artistic perspective (Bitz, 2004).

According to Bitz (2004), the project progressed in stages from creating minicomics, to writing a comic book manuscript including illustrations, and finally creating an original full-color, eight-page comic book. At the conclusion of the project,
every student and instructor completed a one-page survey on perceived literary impact and perceived motivational impact. Eighty-six percent of the students recognized an improvement in their writing and ninety percent of the instructors ascertained that the students’ writing had improved (Bitz, 2004).

According to Bitz (2004), an analysis of the students’ work revealed that the Comic Book Project did help the students meet the four New York State Learning Standards for English Language Arts – students will read, write, listen, and speak for information and understanding, literary response and expression, critical analysis and evaluation, and social interaction. Regarding standard 1 (information and understanding), students processed information related to the creation of a comic book, learned new vocabulary, and researched information and demonstrated understanding through the comic book format (Bitz, 2004). Regarding standard 2 (literary response and expression), students wrote their stories and created art as a means of literary response and expression. Standard 3 (critical analysis and evaluation) was evident toward the completion of the manuscript stage when the students analyzed and evaluated their work. Finally, standard 4 (social interaction) was verified through the students’ better understanding of themselves and those around them.

Jones (2004) reported significant increases in the Academic Performance Index (API) score at Moffett Elementary, a large, inner-city school in Metropolitan Los Angeles. Ninety-six percent of the Moffett Elementary School’s student population received free and reduced lunch, and eighty-five percent of the students’ parents spoke only Spanish. Moffett’s mean student achievement data fell consistently below the 25th
quartile on standardized assessment measures and in 1999 was identified as an underperforming school by the State of California. Moffett employed the Leonard Bernstein Center Artful Learning school reform model (LBC), which used a comprehensive school program design aligned with classroom instruction and curricular components (Jones, 2004). All curriculum and instruction at Moffett Elementary School was designed and delivered through the LBC Artful Learning frames of *experience, inquire, create, and reflect*. Students at Moffett engaged in the study of mathematics, the sciences, and English language arts through the experience of a chosen artistic masterwork followed by inquiry and questioning, original creations, and reflection. In 2001, Moffett Elementary’s Academic Performance Index increased by thirty points (Jones, 2004). The following year the API increased forty points, and in 2003, the API increased another seventy-seven points, which was sixty-four points above the state target for student improvement (Jones, 2004).

The creative arts have proven useful by fostering positive relationships, academic motivation, and a climate of respect (Boldt & Brooks, 2006). The goal of the on-campus University Charter School for Waco Methodist Children’s Home was to address the problem of maintaining authority, building enriching relationships, and increasing academic performance. In order to accomplish this mission, the school utilized the Circle of Courage model philosophy which focuses on the universal need all children have for belonging, mastery, independence, and generosity (Boldt & Brooks, 2006). The integration of creative activities supported the goal of higher achievement standards. When the Methodist Children’s Home eighth grade students took the Texas state
assessment in United States history, they scored over 85% compared with the state performance of at-risk students of 70%. Boldt and Brooks credited this academic gain to the creativity in the United States History curriculum. Boldt and Brooks reported that the same high pass rate occurred in reading due to creative instructional techniques.

Boldt and Brooks (2006) concluded that students improved academically because they were focused and engaged. In addition, the students involved in creative activities demonstrated lower incidents of negative class behavior.

Finnan-Jones (2007) studied the mathematical achievement of English language learners who participated in an arts program. Students who are new immigrants to the United States have low levels of English proficiency and low socioeconomic status. Finnan-Jones suggested that arts education might reduce some of the performance differences by providing an environment in which students are given the opportunity to improve their language and mathematics skills. In Finnan-Jones’ study, English language learners participated in arts instruction where they were given the opportunity to learn and apply mathematical concepts through art activities. English language learners who participated in the arts program in fourth and fifth grades made significantly greater gains than the students in the comparable group of non-participants. The findings from the sample of fourth and fifth grade English language learners supported the view that standardized tests scores in mathematics increased significantly and students participating in arts education made greater gains in mathematics.

Tanner (2007) studied the academic difference between music students and non-music students in a large west Texas urban school district. The purpose of the study was
to compare the performance on the Texas Assessment of Academic Skills (TAKS) for mathematics and English language arts at the tenth grade level between high school students who participated in music education and those who did not participate in music education programs. According to Tanner, the results indicated that tenth grade students who participated in a music program scored significantly higher on the English language arts and mathematics sections of the 2008 TAKS test than did their non-music peers. Tanner further reported that statistical significance was found in regard to gender with female music students outscoring all other groups on both sections of the tests.

Wright (2007) determined that an arts integrated curriculum had an effect upon the Tennessee Comprehensive Assessment Program (TCAP) language arts and mathematics scores for fifth and sixth grade students in two magnet schools in rural Tennessee. Magnet I had an arts-based curriculum, and Magnet II had a math, science, and technology curriculum. Both schools had a majority of Black and disadvantaged non-minority student populations. The students in both schools increased their scores and made enough value-added gains to meet adequate yearly progress. The results of this study showed that the fifth and sixth grade students who attended Magnet II scored significantly higher than the Magnet I school in math. In addition, fifth grade students enrolled in Magnet II scored significantly higher in language arts than the Magnet I school students. However, sixth grade students enrolled in Magnet I scored higher on the TCAP language arts test.
No Effects of the Arts on Academic Achievement

The National Assessment of Educational Progress (NAEP) conducted two surveys on art achievement (Efland, 1990). The results of the 1994 survey showed no significant difference in overall quality in drawing and design items in the assessment between those children in schools where art was taught and those where it was not taught. Similar results were obtained in the second assessment in 1997 with regressions in the area of valuing art.

The National Assessment of Educational Progress (NAEP) is the only on-going survey of students’ educational progress that has reported on the knowledge and skills of students in the United States for over twenty-five years (Persky et al., 1998). NAEP conducted a national assessment in the arts at grade eight. Representative samples of public and nonpublic school students were assessed in music and visual arts, and a special sample was assessed for theatre. Unfortunately, a sample suitable in size and national distribution could not be found for the area of dance.

Winner and Cooper (2000) conducted two meta-analyses on experimental studies that tested the hypothesis that studying the arts causes improvement in academic achievement. There was no evidence that arts education had any educationally significant impact on verbal achievement. There was no evidence that verbal academic achievement would improve when the arts were integrated with academics rather than taught separately. There was no evidence that arts education had any educationally significant impact on math achievement (Winner & Cooper, 2000).
Arts education includes open-ended inquiry, creative problem forming, and creative problem solving (Moga, Burger, Hetland, & Winner, 2000). Moga et al. (2000) conducted a meta-analysis to test the claim that arts study helps develop creative thinking skills that can be transferred to other disciplines. Four correlational studies and six experimental studies were examined in order to determine whether there was any evidence of transfer from arts education to verbal or visual creative thinking. While there was an association between arts study and performance on creativity measures, no causal conclusion could be drawn from the correlational studies. No support for a causal relationship between arts study and verbal creativity could be provided from the experimental studies. Moga et al. acknowledged that equivocal support for a causal relationship between arts study and performance on figural creativity tests did exist. The correlational studies revealed a modest association between arts study and performance on creativity measures. Modest evidence existed for a causal relationship between arts study and verbal creativity measures, and there was evidence of some transfer from arts study to performance on tests requiring drawing, but no transfer from arts study to performance on tests requiring the generating of verbal skills (Moga et al., 2000).

In order to test the hypothesis that music instruction helps children acquire reading skills, Butzlaff (2000) conducted a meta-analyses of six experimental and twenty-five correlational studies. There was a strong and reliable association between music study and performance on standardized reading tests. An examination of experimental studies tested the directional and causal hypothesis that music instruction leads to
increased reading achievement. The meta-analyses of the experimental studies yielded no effect (Butzlaff, 2000).

Dance engages students in many ways; therefore, dance educators have claimed that because of its multifaceted nature, dance leads to cognitive outcomes in other areas besides the learning of dance (Keinanen, Hetland, & Winner, 2000). Keinanen et al. reported the results of two meta-analyses that tested the claims that dance instruction leads to improvements in reading and in nonverbal reasoning. Experimental studies of dance on movement education were included that analyzed non-dance, cognitive outcomes, and studies with control groups and quantified outcomes. The first meta-analysis was performed on four studies whose outcomes were verbal measures that assessed reading abilities. The results did not support a conclusion that dance instruction serves as a method of teaching reading (Keinanen et al., 2000).

The second meta-analysis was performed on three studies whose outcomes were nonverbal ability measures. These studies assessed the effect of dance instruction on nonverbal performance IQ scales and on nonverbal paper and pencil tests. One study compared instrumental dance instruction to free motor activity, one compared creative dance to standard dance, and two compared creative dance to a traditional exercise program. Kienanen et al. (2000) concluded that there was a relationship between the kind of dance instruction in the four studies and the kinds of nonverbal skills assessed. Although the analysis suggested that dance instruction leads to improved visual-spatial skills, the conclusions were strongly limited by the small number of studies. As a result of the meta-analyses, Keinanen et al. reported that no strong conclusions could be drawn
about the ability of dance to promote cognitive skills that transfer to reading or nonverbal reasoning.

Burger and Winner (2000) reported the results of two meta-analyses of studies that tested the hypothesis that instruction in the visual arts improves reading. The first meta-analysis compared instruction in art to no special instruction. Participants in the control group received only the regular art curriculum and did not receive any kind of alternative art program. The \( t \)-test of the mean yielded a value of .53, which was not significant, \( p = .61 \), which indicated that the findings could not be generalized to new studies. Burger and Winner concluded that because of the lack of significance of the \( t \)-test, and because the confidence interval spanned zero, there was no reliable relationship between arts instruction and reading improvement. There was, however, a moderate effect on reading readiness scores.

Hetland and Winner (2001) identified seven areas where no reliable causal links were found: arts-rich education and verbal and mathematics scores, arts-rich education and creative thinking, learning to play music and mathematics, learning to play music and reading, visual arts and reading, dance and reading, and dance and nonverbal reasoning. Based on thirty-one reports, a small to medium correlation was found between an arts-rich education and verbal and mathematics scores. Hetland and Winner suggested that the correlational findings could be explained by non-causal means. For example, high-achieving students may choose to study the arts; therefore, students who take arts courses are also high achieving, high test-scoring students. However, no evidence was found that studying the arts causes improvement in academic achievement.
(Hetland & Winner, 2001). No relationship was found between an arts-rich education and verbal creativity test measures. A small causal relationship was found between music training and math as well as music and reading. A very small relationship was found between visual arts and reading based on five reports in which visual arts was taught separately from reading. Hetland and Winner acknowledged that this relationship was due to reading readiness outcomes and did not hold true for reading achievement outcomes. A medium-sized relationship was found between integrated arts/reading instruction and reading outcomes. A small relationship was found between dance and reading as well as dance and improved visual-spatial skills. Hetland and Winner affirmed that these relationship outcomes could not be generalized.

Graham et al. (2002) conducted a study of the effects of the Virginia Standards of Learning (SOL) assessment program on elementary school art, music, and physical education. Seventy percent of Virginia’s students must pass the SOL tests by 2007 or Virginia schools face the possibility of losing their accreditation. Virginia’s teachers and school administrators experienced increasing pressure to have their students perform well on the tests. Since the inception of the SOL program in 1998, Virginia schools struggled with ways to help students improve their performance and thus began increasing the use of direct instruction, drills, and factual learning while discontinuing activities such as student collaboration, games, experiments, drama, and the integration of other subjects. Another solution to improve performance was to eliminate the frill subjects that are not part of the core curriculum of mathematics, science, English, and social studies (Graham et al., 2002).
Graham et al. (2002) researched whether Virginia elementary school principals had eliminated or reduced instructional time for art, music, and physical education (AMPE) to gain more time for core subjects, and whether there was a relationship between the time allotted to AMPE and scores on the SOL tests in third and fifth grades. For their study, Graham et al. evaluated 547 returned surveys which requested each principal to report the amount of time allocated for specialists to teach AMPE each week and whether they had changed that time from the previous year or planned to do so in the coming year. On average, approximately forty percent of the elementary schools allocated thirty-one to sixty minutes per week for physical education. In addition, more time was allocated for physical education than for either music or art. Over eighty-three percent of the principals reported no change in the allotted time for AMPE and eighty-eight percent planned no change in the allocated time for AMPE in the coming year (Graham et al., 2002).

Graham et al. (2002) reported no inverse relationship between the time allocated to AMPE and SOL scores. They concluded that time allotted to AMPE did not seem to be related to success or failure on the Virginia SOL tests. However, they found that reducing instructional time in AMPE potentially reduced the benefits that students obtained from studying these subjects.

*Mixed Findings of the Effects of the Arts on Academic Achievement*

The arts assessment was designed to measure the content specifications described in the arts framework for the National Assessment of Educational Progress (NAEP)
According to the NAEP, the fundamental principle for the arts framework is that dance, music, theatre, and visual arts are critical components of a comprehensive education and should include both creating/performing and studying and analyzing existing works. The purpose of the NAEP 1997 Art Report Card was to inform educators, policymakers, and the public about student achievement in the arts (Persky et al., 1998).

Each student participant was assessed in one of the three arts: music, theatre, or visual arts. Each student received one booklet containing two blocks of cognitive responding exercises and three blocks of background questions in the first portion of the assessment. The cognitive blocks included multiple-choice questions, short constructed-response questions, and extended constructed-response questions. A multi-level scoring guide that defined criteria for full credit, partial credit, or no credit was used to evaluate answers to the constructed-response questions. According to Persky et al. (1998), the second portion of the assessment required each student to complete one creating and/or performing block in theatre and visual arts and two creating and/or performing blocks in music. The Creating, Performing, and Responding portion and the background questionnaires made it possible to analyze and compare the performances of various subgroups of students. The NAEP 1997 Arts Report Card examined and compared the arts performance of groups of students by demographic qualities or by responses to background questionnaires pertaining to experiences in a particular arts area. Overall summaries for Creating, Performing, and Responding, and their relationships to background variables were presented. Creating and Performing results were presented in
terms of an average percentage of the maximum possible score, whereas Responding
results for music, theatre, and visual arts were grouped for summarization on three NAEP
Arts Responding scales, each of which ranged from 0 to 300 (Persky et al., 1998).

In the overall summary for music, the results of the Responding portion of the
music assessment, which included a wide scope of musical stimuli, item types, and
content areas, indicated that most eighth grade students were able to distinguish phrases
as being alike or different; identify the timbres of some solo instruments; perceive the
contour of short, melodic phrases; and provide correct answers about the functions of
music in society (Persky et al., 1998).

The results of the Creating portion of the music assessment, which included
creating an ending to a rhythmic phrase; creating a rhythmic embellishment based on a
familiar tune; developing an original melody; and participating in improvisation
activities, indicated that twelve percent of the students scored at the Developed level in
their ability to play in rhythm with the background music of “The Lion Sleeps Tonight,”
and thirty-nine percent were able to play with the “Rock Improvisation” set of exercises
(Persky et al., 1998). When performing vocal improvisations, forty-seven percent of the
students were able to perform in rhythm with the background music at the Developed
level, while four percent were able to sing in the key of the background music at the
Developed level. Persky et al. further reported that thirteen percent of the students were
able to create vocal improvisations that were at or above the Adequate level in terms of
overall interest and appeal; however, many students demonstrated a lack of ability to
evaluate and discuss their creative activities. Persky et al. acknowledged that
on two written self-evaluation questions, twelve percent and fourteen percent of the
students received a score of Adequate.

The results of the Performing portion of the music assessment, which required
students to play familiar tunes by ear on a MIDI keyboard, revealed that twenty-five
percent of the students performed the pitches at an Adequate level or above and twenty-
six percent performed the rhythms at an Adequate level or above on the tune “Twinkle,
Twinkle, Little Star.” The Performing portion also required students to sing “America”
with audiotape accompaniment. On this measure, thirty-five percent performed at or
above Adequate level, twenty-four percent for tone, and fifty-two percent for diction.
Furthermore, for the song “America,” seventy-eight percent and fifty-one percent scored
at or above the Limited level for rhythm and expression, respectively (Persky et al.,
1998).

The results of the NAEP background questionnaires revealed patterns in student
performance and how they relate to various student characteristics (Persky et al., 1998).
The results affirmed that higher student proficiency in the Creating and Performing
portions of the music assessment was associated with several in-school and out-of-school
musical activities such as taking private lessons or attending concerts or performances.
Students whose scores on the Responding portion of the music assessment were in the
upper level of the scale reported significantly higher rates of participation in many in-
school and out-of-school musical activities than students in the lower level of the scale.
On the Performing portion of the music assessment, students whose teachers required
them to play instruments every day scored higher in music performing than all other
groups, and students whose teachers required them to sing every day scored higher in music performing than students not enrolled in a music class (Persky et al., 1998).

In the overall summary for theatre, the results of the Responding portion of the theatre assessment indicated that more students could describe feelings conveyed by actors or what actors did physically than could explain how actors used their faces, voices, and bodies to convey character and feeling (Persky et al., 1998). Forty-one percent of the students described the voice used by an actor in the *Bug Pleasing* radio play whereas only fourteen percent described two ways the actor’s voice conveyed his character. More students could describe designs for elements of staged productions than could link those elements to make an impression on the audience. Thirty-four percent of the students gave clear, specific descriptions of a set design for a stage production, but only three percent explained why one or more aspects of their designs would be suitable for a particular audience. Many students demonstrated some knowledge of the technical elements of theatre. Sixty-five percent of the students offered accurate plans for creating lighting effects for a scene in *Member of the Wedding*, whereas seventeen percent drew complete, error-free plans. When asked to write an alternative ending for a short play, thirty-five percent of the students created a solid ending, while only three percent wrote an ending that demonstrated understanding of the playwright’s intentions (Persky et al., 1998).

The results of the Creating/Performing portion of the theatre assessment revealed that many students demonstrated a solid level of spatial awareness (Persky et al., 1998). Eighty-nine percent of the students demonstrated clear spatial awareness. Seventy-nine
percent of the students could be consistently heard and understood while performing. Sixty-seven percent of the students exhibited the ability to communicate meaning to an audience while performing. Persky et al. further reported that twenty-three percent of the students worked consistently well together.

Results for both Responding and Creating/Performing indicated that in-school activity was positively associated with theatre achievement (Persky et al., 1998). Significantly larger percentages of students in the upper level of the Responding scale had acted in live theatre productions, had received classroom instruction, were involved with technical work in productions, and received classroom instruction in making films or video than had students in the middle or lower levels of the scale. Students who indicated that they had participated in playwriting, had acted, and had performed for audiences outperformed those who indicated that they had never done so (Persky et al., 1998).

In the overall summary of visual arts, the results of the Responding portion of the visual arts assessment revealed that students could accurately describe some aspects of artworks (Persky et al., 1998). Twenty-nine percent of the students described three ways the painter Raphael created a sense of distance in a *Madonna and Child* painting, and fifty-three percent identified two ways. Twenty-two percent of the students identified the contribution of an unusual aspect of Romane Beardon’s *Pittsburgh Memories* collage to the entire work, and fourteen percent explained how he created contrast between the interior and exterior space in the collage. Finally, in the historical and cultural contexts of artworks, fifty-five percent of the students identified contemporary Western art and
Cubism, but only four percent of the students wrote an essay linking aesthetic features of artworks (Persky et al., 1998).

The results of the Creating portion of the visual arts assessment indicated that creating two-dimensional artworks was demanding for students (Persky et al., 1998). Five percent of the students created self-portraits that demonstrated sensitive use of materials, details, and compositional awareness, and one percent of the students created collages that showed an awareness of color, texture, and contrast; however, forty-two percent used collage techniques in parts of their collages. In a task that required students to design a package to transport a fish while riding a bicycle, sixteen percent of the students planned a package design that would protect the fish and hold the water. Ten percent of the students manipulated plasticine to create skillful three-dimensional sculptures, and only three percent created freestanding sculptures into an imaginative interpretation of kitchen utensils (Persky et al., 1998).

The results for both Responding and Creating revealed that in-school arts activity was positively associated with arts achievement (Persky et al., 1998). The results revealed that a significantly larger percentage of students in the upper level of the Responding scale had taken visual arts classes and painted or drew at least once a week than their peers in the middle and lower levels of the scale. Assessment results demonstrated that the percentage of students in the upper level of the Responding scale who kept a portfolio of their artwork was significantly larger than the percentage of their peers in both the middle and lower levels of the scale. According to Persky et al., this
finding supports the belief that portfolios help students evaluate and direct their own arts learning. A larger percentage of students in the upper level of the Responding scale than in the middle or lower levels of the scale illustrated their work in other subjects. This finding has potential value to educators interested in arts integration in other academic subjects (Persky et al., 1998). Doing artwork and attending art museums and exhibits outside of school were positively associated with student performance in the visual arts. For both variables, the percentage of students in the upper level of the Responding scale was significantly higher than the percentages of students in the middle and lower levels of the scale. Opportunities to examine actual works increase students’ knowledge and appreciation of art as well as the social and historical contexts of art (Persky et al., 1998).

The comprehensive results for Creating, Performing, and Responding in all arts areas in the NAEP 1997 Arts Assessment were reported for selected demographic groups, which included region, gender, race, type of school, and parental education (Persky et al., 1998). According to Persky et al., statistically significant patterns emerged for gender, race, and parental education. Females consistently outperformed their male counterparts, White and Asian students had higher average arts scores than did Black or Hispanic students, and higher levels of parental education were associated with higher levels of student achievement for all arts areas (Persky et al., 1998).

Winner and Cooper (2000) identified twenty-seven studies that were not included in the meta-analyses (because an effect size $r$ could not be calculated or the study lacked a control group). The studies were mostly correlational ones demonstrating that students who attended a school in which the arts played a central role were high academic
achievers. However, due to a lack of pretest scores prior to entering the arts-rich schools, no determination could be made whether the students did well because they were a self-selected sample or because of the type of education they received. Winner and Cooper classified each study as demonstrating a positive association between academic achievement and an arts program or as failing to demonstrate such an association. Seventeen of the studies reported a positive outcome, and ten reported null or mixed findings. Winner and Cooper concluded that the majority of the studies revealed that arts education was associated with higher academic achievement. A binomial probability test demonstrated that the chances of finding seventeen positive studies out of twenty-seven is associated with a probability level of \( p = .12 \), and thus does not achieve statistical significance at \( p < .05 \) (Winner & Cooper, 2000).

In order to test for the motivational link between arts learning and learning in other disciplines, Winner and Cooper (2000) assessed motivational indicators from twenty-three studies. Twenty-one of the studies reported positive results and two reported null results. Therefore, Winner and Cooper concluded that the majority of the studies showed positive indirect academic results.

Winner and Cooper (2000) affirmed that the meta-analyses demonstrated that a positive relationship between arts education and academic achievement does exist. However, no evidence revealed a causal relationship between arts education and verbal or math achievement. Winner and Cooper’s meta-analyses revealed that students who self-select to study the arts are high achievers, and poor, at-risk students who choose to study the arts do better in school than those who do not choose to study the arts. Winner and
Cooper concluded that there was no evidence that arts education had a causal effect on academic achievement. The experimental studies revealed essentially no influence of arts education on the improvement of academic achievement (Winner & Cooper, 2000).

Hetland (2000) conducted two meta-analyses of studies that tested the Mozart effect. The Mozart effect suggests that listening to music increases spatial scores. The first meta-analysis tested whether listening to music increased performance on spatial tasks. Of the thirty-six studies analyzed, the twenty-seven experiments that used spatial-temporal measures produced the highest mean ($r = .20$); the four experiments that used mixed measures produced an intermediate mean ($r = .15$); and the five experiments that used non-spatial-temporal measures produced the lowest mean ($r = .04$). Hetland concluded that listening to music enhances performance on spatial-temporal tasks more than nonspatial-temporal tasks.

Inquiry into possible transfer effects from the arts is important both educationally and scientifically (Winner & Hetland, 2000). Educationally, teachers can use any transfer effects that do exist effectively. Scientifically, inquiry into the effects of the arts can relate how the mind works and how skills are or are not related in the brain (Winner & Hetland, 2000).

Summary

Inclusion of the arts in public schools is controversial and costly. Findings from the research on the relationship between the arts and academic achievement differ. Several studies (Boldt & Brooks, 2006; Burton, Horowitz, & Abeles, 1999; Catterall, Chapleau, & Iwanaga, 1999; Eisner, 1996; Finnan-Jones, 2007; Gould, 2000; Heath,
1998; Podlozny, 2000; Tanner, 2007; Vaughn & Winner, 2000; Wolf, 1999) found sufficient evidence to support the claim that the arts positively impact academic achievement. Conversely, research studies by Butzlaff (2000); Graham, Parker, Wilkins, Fraser, and Tembo (2002); Keinanen, Hetland, and Winner (2000); Moga, Burger, Hetland, and Winner (2000); and Winner and Cooper (2000) reported no evidence that arts education had any significant effect on academic achievement. A few studies (Hetland, 2000; Persky, Sandene, & Askew, 1998; Winner & Hetland, 2000) reported mixed findings of the effects of the arts on academic achievement. Few studies looked at the issue in a longitudinal way.
CHAPTER III

METHODOLOGY

This research study examined the impact of an arts-based education program on middle grade students’ academic achievement. The purpose of the study was to determine whether attending an arts-based middle school positively impacted student academic achievement as measured by standardized achievement tests.

Population

Data were collected on student achievement from grades four, eight, and nine through twelve (see Table 1). Each of the sixth-nine subjects attended Mt. Pleasant High School (MPHS) and Mt. Pleasant Middle School of the Visual and Performing Arts (MPMSVPA), an intense arts-based program. All students attending the arts-based school were students zoned for that particular school. Comparison data from grades four, eight, and nine through twelve were collected from a random sample of seventy graduates of other high schools in the county, none of whom attended MPMSVPA.
There were 587 graduating seniors among the other five county high schools attended by students zoned for each of the particular schools. Fifty-one percent of the graduates were from high school 1, thirty-three percent from high school 2, eight percent from high school 3, six percent from high school 4, and the remaining two percent from high school 5 (see Table 2). Every fifth student – thirty-six from high school 1, twenty-three from high school 2, five from high school 3, four from high school 4, and two from high school 5 - from each school comprised the sample size for the comparison group.
(see Table 2). Each of these graduates attended a middle school in Maury County other than MPMSVPA.

Table 2

Number and Percentage of Representation per High School

<table>
<thead>
<tr>
<th>High School</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School 1</td>
<td>36</td>
<td>51</td>
</tr>
<tr>
<td>High School 2</td>
<td>23</td>
<td>33</td>
</tr>
<tr>
<td>High School 3</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>High School 4</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>High School 5</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

The total number of students selected for the comparison group in the study was seventy. The data set for this study consisted of scores for students who graduated from MPHs in 2008 and who also attended MPMSVPA. The comparison sample consisted of scores for students who graduated from one of the other five county high schools and who attended a middle school in the county other than MPMSVPA.

Setting

J. E. Woody Mt. Pleasant Elementary School (MPES) is a Title I school which houses the Stepping Stones Preschool Program and kindergarten through fourth grade. A Reading First Grant that targets at-risk students assists the academic curriculum at MPES. All students at MPES take a thirty-minute art and music class once a week. A drama team is offered to students in second through fourth grades. Students try out at the
beginning of the school year. Students may also participate in the glee club, recorder choir, or string orchestra at MPES. These groups often perform during school activities such as parent-teacher organization (PTO) meetings. Students’ musical talents are showcased annually in the spring talent show.

MPMSVPA houses thirty regular classrooms, one twenty-five unit computer lab, one science lab, one family and consumer science lab, one completely automated library, an eight hundred fifty capacity gymnasium, and one wing dedicated to the visual and performing arts. The arts wing includes a four hundred sixteen capacity auditorium, one musical arts room, one midi-tech lab, one dance studio, one garage band studio, one art room, and one video studio.

In addition to the academic curriculum offered at MPMSVPA, all fifth through eighth grade students take a wellness class during morning arts and either band, choir, dance, drama, general music, or visual art. Band class provides instruction in woodwind, brass, and percussion instruments. Choir is a combination of performance ensemble, music theory, and instruction in vocal technique. Dance instruction includes movement exercises to ensure proper stretching and increased flexibility. Students are introduced to beginning classical, jazz, ballet, and tap for theatrical production. Drama instruction includes theater make-up, characterization studies and practice, action/reaction exercises, understanding and following stage directions, studies of period costuming, puppetry, language and dialect, accents, voice projection, and interacting with props and other actors/actresses on stage. General music offers instruction on proper singing, reading music, and understanding music basics. In visual art, students learn to select and control
a variety of art tools, media, and processes used to create works of art. Students learn basic procedures necessary for the development of a personal artistic style and technique as they incorporate the elements of art and design. All MPMSVPA students also select one afternoon performance class. The afternoon arts classes focus on performance opportunities for students. Performance opportunities range from large productions to smaller group recitals and performances.

In 2000, Mt. Pleasant High School had an enrollment of seven hundred students in grades six through twelve. MPMSVPA was built in 2001, accommodating grades five through eight and leaving MPHS with the traditional grades nine through twelve.

In addition to the academic curriculum and vocational curriculum offered at MPHS, all ninth through twelfth grades students may choose electives from the fine arts curriculum. Art I through Art IV, band, Chorus I A and B, drama, and general music classes are offered as courses within the fine arts curriculum.

The Kids On Stage Foundation of Maury County (KOS) is a partner with the Maury County Public School System and MPMSVPA. KOS is a non-profit Tennessee corporation founded in 1999 by Jim G. Barrier, Chief Executive Officer (CEO) of Smelter Service Corporation in Mt. Pleasant, Tennessee. It is patterned after Kids On Stage Foundation, Incorporated, Williamson County, Tennessee, which was founded by Aubrey Preston in 1996. The KOS foundation of Maury County was founded to make a difference in the community of Mt. Pleasant and in Maury County. The vision of KOS is to develop a more exceptional student through the visual and performing arts. KOS promotes a unique philosophy of learning in which an arts curriculum is taught in
conjunction with the school’s core academic curriculum. KOS provided the funding for the building of the MPMSVPA arts wing and its equipment.

Instrumentation

The scores from the 2000 and 2004 Tennessee Comprehensive Assessment Program (TCAP) achievement test produced by CTB/McGraw-Hill Corporation and used by the state of Tennessee for achievement and accountability testing in grades three through eight were used for this analysis. The language arts, mathematics, and science portions of the TCAP achievement test contain criterion-referenced items based on the Tennessee curriculum standards. The TCAP achievement test is a timed, multiple-choice assessment that measures skills in reading/language arts, mathematics, science, and social studies. For this research, the reading and social studies scores were not evaluated.

The scores from the 2004-2008 Gateway Tests were used for analysis. The Gateway Tests were intended to raise the academic bar for all high school students and to add accountability for students’ academic performance. In the 2001-2002 school year, the Department of Education began to administer the Gateway Tests three times annually to accommodate students completing work in the fall, spring, and summer semesters. The three Gateway Tests include language arts (course is English II), mathematics (courses are Algebra I and Math for Technology II), and science (courses are Biology I and Biology for Technology II).

Procedures and Data Collection

First, permission to conduct the study was obtained through approval of the Institutional Review Board of Tennessee State University (see Appendix A).
Secondly, permission to conduct the study in the county school system was obtained from the director of schools (see Appendix B). Then permission to gather the student data, i.e., TCAP language arts, mathematics, and science test scores, and Gateway language arts, mathematics, and science test scores, were obtained from principals of the respective schools (see Appendix C). TCAP language arts, mathematics, and science test scores were obtained for the 2000 and 2004 achievement tests for the students included in the study. Gateway language arts, mathematics, and science test scores were obtained for the 2004 through 2008 tests for the students included in the study. The Gateway Tests are administered three times annually. Students must take each portion of the test from ninth through twelfth grade until they pass it. The highest grade for each portion of the Gateway was used for this study when there was more than one score. Student score records were numerically coded to preserve the anonymity and all legal and ethical considerations of the students involved. Finally, all data were imported into the SPSS v15.0 program for analysis.

Research Questions and Related Statistical Hypotheses

This research attempted to answer one overarching question: Are patterns of improved academic achievement discernable after an arts-based middle school experience?

Specific research questions and their associated statistical hypotheses were as follows:
Research Question 1: Is there a difference in the trend over the three test periods as relates to the arts-based curriculum student group vs. the standard education curriculum student group?

Null Hypothesis 1: There are no statistically significant differences in any of the comparable piecewise slopes of the two independent groups of arts-based students vs. standard education students on the combined dependent variables of (a) language arts scores, (b) mathematics scores, and (c) science scores (piecewise parallelism).

Alternative Hypothesis 1: There are statistically significant differences in at least one pair of the comparable piecewise slopes of the two independent groups of arts-based students vs. standard education students on the combined dependent variables of (a) language arts scores, (b) mathematics scores, and (c) science scores.

Research Question 2: Is there a difference between the two student groups on overall test scores?

Null Hypothesis 2: There is no statistically significant difference in the two student groups when scores are averaged over all three competency tests (Test of Levels).

Alternative Hypothesis 2: There is a statistically significant difference in the two student groups when scores are averaged over all three competency tests (Test of Levels).

Research Question 3: Is there a difference between the standardized values of the three types of test scores, (a) language arts, (b) mathematics, and (c) science, when averaged over the two independent student groups?
**Null Hypothesis 3:** There is no statistically significant difference among any of the three types of standardized test scores, (a) language arts, (b) mathematics, or (c) science, when evaluated over the two independent student groups (Test of Flatness).

**Alternative Hypothesis 3:** There is a statistically significant difference between at least one pair of the standardized test scores, (a) language arts, (b) mathematics, or (c) science, when evaluated over the two independent student groups.

If the null hypothesis is rejected for any of the three research questions, then post hoc comparisons will be performed for significant effects as relates to groups, measures (scores), and/or for measures (scores) within groups.

**Data Analysis**

For this study, ex-post facto data included TCAP scores in total language arts, total mathematics, and science; and Gateway Test scores in language arts, mathematics, and science. The study, which was designated an ex-post facto causal-comparative research design also employed repeated measures with three sets of scores compared over three different time periods: (a) year 2000, (b) year 2004, and (c) Gateway passing proficiency score from years 2004-2008. Three dependent variables were evaluated for each time period: (a) language arts, (b) mathematics, and (c) science. One independent variable with the following two groups was identified:

1. Students who attended an arts-based middle school (arts-based curriculum)
2. Students who did not attend an arts-based middle school (standard curriculum).

Profile analysis with a Doubly-multivariate design was used to infer statistical significance in the dependent test score variables between the two independent student
groups; (a) arts-based curriculum vs. (b) standard curriculum, across the three independent variable time periods of (a) 2000, (b) 2004, and c) proficiency score from 2004-2008. Profile analysis is a variation of multivariate analysis of variance (MANOVA). It is applied to situations when there are several dependent variables, each measured on the same scale. The Doubly-multivariate extension of profile analysis includes analysis of several dependent variables at several different times (repeated measures). Specifically this research used the profile analysis Doubly-MANOVA design. Analysis of Covariance was employed to accommodate for the initial differences between the groups in the grade 4 data.

The TCAP and Gateway test scores are not equivalent in measure. Therefore, standardized score values were compared during inferential analysis. Many assumptions are required for profile analysis Doubly-MANOVA. Adequate sample size is needed to assure that there are more research units in the smallest group than the number of dependent variables. In the case of this study, the between-subject effect determined the required sample size. This means that at least four students were needed in each independent group-dependent variable cell count. Other assumptions are the same as for the standard MANOVA analysis and include multivariate normality, absence of outliers, homogeneity of variance-covariance structures, linearity of relationships among the dependent variables, and absence of multicollinearity and singularity. Unequal sample sizes on the independent variable are not an issue for profile analysis because each hypothesis is testing as in a one-way design, and unequal sample sizes only cause problems when there is more than one between-subjects independent variable.
Three repeated measures ANOVAs were performed, one for each of the three dependent measures (test scores), as related to the two independent student groups. The non-parametric Friedman’s test was used to compare the two independent groups on each of the three dependent measures.

**Missing Data**

It is common in survey research to have missing data for certain respondents, so some remedial methods are necessary to treat the missing values (Fink, 2006). Variable, pairwise and listwise deletions of missing values are common ways to deal with this problem in research (Fink, 2006). However, these methods are sometimes criticized because of the dubious underlying assumption that the data are missing at random. Elimination of variables due to missing data can result in specification error, over-fitting of the model, and a larger error term due to the unexplained variance in the dependent variable. If only cases with missing data are eliminated (listwise deletion), degrees of freedom may be reduced, which may reduce the representativeness of the sample and affect the external validity of the study. Also, listwise deletion may result in inaccurate estimates of population variances and any covariances. Elimination of either variables or cases may result in a loss of statistical power which may lead to inflated Type II error.

Pairwise deletion excludes cases only from any calculations involving variables for which they have missing data. Pairwise deletion is considered viable if the missing data is missing completely at random (MCAR). A statistical rule of thumb suggests that missing data can be considered MCAR if the missing observations for a given variable
are less than or equal to five percent. Pairwise deletion was used when missing data was considered MCAR (McKnight, McKnight, Souraya, & Figueredo, 2007).

The remaining two types of missing data are missing at random (MAR) and missing not at random (MNAR). Diagnostic tests can determine if the type of missing is MCAR or not, but not if the missing data is then MAR or MNAR. To confirm the rule of thumb observation (5% or less missing data is MCAR data) diagnostic testing was performed for possible MCAR data using independent t-tests of variable means grouped by dummy scores (missing = 0, not missing = 1) showing significant results between numerous variable means (McKnight et al., 2007). Most of the data in this study was categorical and means were not defined. It was assumed that the missing data was MAR, because the dataset is somewhat homogenous (the cases studied are all students who are similar in age and who attend school in the same general geographic area), and determining the difference between MAR and MNAR would require follow-up measures of contacting cases from the dataset to clarify why they did not have scores on certain tests for certain years, and to assess the data for possible outside influences (latent factors not included in the study) (McKnight et al., 2007).

Because of these constraints, the researcher imputed the missing values with a measure of central tendency related to each variable that had missing values. Because of the commensurate nature of the measures used in profile analysis (dependent test score variables over the three time periods) an imputation procedure for repeated measures was employed. A method popularly used is Tabachnick and Fidell (2007). It replaces missing values with value estimates from the mean for a particular level of the
repeated measure and for the particular case. This procedure was employed for this study. Because the procedure imputes a combined mean value for missing data, the procedure can produce an error term that is smaller than normally would occur if all data were present. An adjustment to a more conservative alpha level can be made to compensate for smaller error terms if the proportion of imputed values is greater than five percent. However, no such procedure was necessary in the present study.

**Power Analysis and Sample Size**

An apriori power analysis was performed to determine the required sample size for this study. GPOWER software was used in this determination. The analysis was performed for apriori sample size calculation on MANOVA; repeated measures, within-between interactions. An alpha level of .05, power of .80, and medium effect size of $f(v) = .25$ were used in calculation. Results indicated that a total sample size of 158 students was required to achieve 80% power in analysis. Power is $(1-\beta)$, where $\beta$ is the chance of Type II error (when one rejects the null hypothesis when it is in fact false). At a power of .80, one has an 80% chance of seeing significance that is truly in the data. Equal distribution of the total sample of 158 students was attempted so that the two groups, one from the arts-based curriculum and the other from the standard curriculum, contained a minimum of 79 students each.
CHAPTER IV

FINDINGS

This study utilized an ex-post facto causal-comparative research design to examine the impact of an arts-based education program on middle grade students’ academic achievement. The purpose of this study was to determine whether attending an arts-based middle school positively impacts student academic achievement as measured by standardized achievement tests.

Inferential Analysis

Assumptions for Inferential Analysis

The dataset was investigated for the inferential analysis assumptions of absence of missing data, adequate sample size, multivariate normality, absence of outliers, homogeneity of variance-covariance matrices, linearity and absence of multicollinearity.

The frequency of missing data for each category of test scores (language arts, math, and science) for each year (grade 4 scores, grade 8 scores, and grade 9-12 scores) was investigated. Table 3 presents each test score variable and the frequency and percentage of missing data in the original study sample (N = 140). Grade 4 had the highest frequencies of missing data for all three subject categories (language arts, math, and science), with approximately 15% of cases for each subject variable missing information.
### Table 3

*Frequency of Missing Data for Initial Set of Study Variables (N = 140)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Freq. Missing on Variable</th>
<th>% Missing on Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group (arts-based vs. non-arts-based)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Grade 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCAP – Language Arts</td>
<td>21</td>
<td>15.0</td>
</tr>
<tr>
<td>TCAP - Math</td>
<td>22</td>
<td>15.7</td>
</tr>
<tr>
<td>TCAP – Science</td>
<td>22</td>
<td>15.7</td>
</tr>
<tr>
<td>Grade 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCAP – Language Arts</td>
<td>7</td>
<td>5.0</td>
</tr>
<tr>
<td>TCAP - Math</td>
<td>7</td>
<td>5.0</td>
</tr>
<tr>
<td>TCAP – Science</td>
<td>7</td>
<td>5.0</td>
</tr>
<tr>
<td>Grade 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gateway – Language Arts</td>
<td>4</td>
<td>2.9</td>
</tr>
<tr>
<td>Gateway – Math</td>
<td>9</td>
<td>6.4</td>
</tr>
<tr>
<td>Gateway - Science</td>
<td>6</td>
<td>4.3</td>
</tr>
</tbody>
</table>

*Note.* Freq. = Frequency; TCAP = Tennessee Comprehensive Assessment Program.

In order to retain as many records as possible and preserve power during inference, it was decided that mean imputation via regression would be performed to replace missing values in the dataset. Regression models were developed for each of the nine grade-subject variable constructs of 1) Grade 4 – Language Arts (TCAP4LA), 2)
Grade 4 – Math (TCAP4MATH), 3) Grade 4 – Science (TCAP4SCIENCE), 4) Grade 8 – Language Arts (TCAP8LA), 5) Grade 8 – Math (TCAP8MATH), 6) Grade 8 – Science (TCAP8SCIENCE), 7) Grade 12 – Language Arts (GATELA), 8) Grade 12 – Math (GATEMATH), and 9) Grade 12 – Science (GATESCIENCE). Each of the nine grade-subject variable constructs was individually regressed onto the other two score variables for each case. The resulting regression equations were applied to each case with missing values, and a score was computed for each missing datum. For example, TCAP4LA was regressed onto the two predictors of TCAP8LA and GATELA to obtain a regression equation which was applied to obtain the missing scores on TCAP4LA.

Table 4

Regression Equations Derived for Use in Regression Mean Imputation of Missing Data, According to Regressed Variable (N = 140)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Equation</th>
<th>$R^2$</th>
<th>$R^2$-Adj.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCAP4LA</td>
<td>-17.155 + .510(TCAP8LA) + 1.114(GATELA)</td>
<td>.815</td>
<td>.664</td>
</tr>
<tr>
<td>TCAP4MATH</td>
<td>-3.665 + .714(TCAP8MATH) + .634(GATEMATH)</td>
<td>.863</td>
<td>.745</td>
</tr>
<tr>
<td>TCAP4SCIENCE</td>
<td>-2.555 + .609(TCAP8SCIENE) + .631(GATESCIENCE)</td>
<td>.793</td>
<td>.629</td>
</tr>
<tr>
<td>TCAP8LA</td>
<td>-26.111 + .468(TCAP4LA) + 1.25(GATELA)</td>
<td>.827</td>
<td>.684</td>
</tr>
<tr>
<td>TCAP8MATH</td>
<td>-17.414 + .632(TCAP4MATH) + .856(GATEMATH)</td>
<td>.874</td>
<td>.764</td>
</tr>
<tr>
<td>TCAP8SCIENCE</td>
<td>-24.964 + .404(TCAP4SCIENCE) + 1.504(GATESCIENCE)</td>
<td>.866</td>
<td>.750</td>
</tr>
<tr>
<td>GATELA</td>
<td>27.053 + .125(TCAP4LA) + .153(TCAP8LA)</td>
<td>.801</td>
<td>.642</td>
</tr>
<tr>
<td>GATEMATH</td>
<td>24.564 + .104(TCAP4MATH) + .158(TCAP8MATH)</td>
<td>.773</td>
<td>.598</td>
</tr>
<tr>
<td>GATESCIENCE</td>
<td>21.681 + .065(TCAP4SCIENCE) + .235(TCAP8SCIENCE)</td>
<td>.826</td>
<td>.682</td>
</tr>
</tbody>
</table>
Table 4 presents the regression equations obtained for computing missing values on each of the nine dependent score variables, as well as model $R^2$ values for each regression equation model. Once mean imputation was performed, a total of 139 cases had complete data for all nine dependent variables. Therefore, the assumption of absence of missing data was not violated.

One hundred forty students were originally identified for inclusion in this study. One student had information on only one year of test scores. Regression mean imputation was used to replace missing values, but meaningful replacement values for missing data could not be obtained for this one student. Therefore, this student data was removed from the dataset used for inferential analysis. A total of 139 records were retained. A requirement for adequate sample size in profile analysis is that there should be more research units in the smallest group than there are dependent variables (Tabachnick & Fidell, 2007). This was the case for the present study. Therefore, the assumption of adequate sample size was not violated.

According to Tabachnick and Fidell (2007) profile analysis is as strong to violation of normality as other forms of MANOVA. Unless there are fewer cases than dependent variables in the smallest group and highly unequal $n$, then deviation from normality of sampling distributions would not be expected. There were enough cases per dependent variable, and the sizes of the two student groups of arts-based vs. standard curriculum only differed by one record ($n = 69$ and $n = 70$, respectively). Therefore, the assumption of multivariate normality was not violated.
Outliers in a dataset have the potential to distort results of an inferential analysis. A check of boxplots for the nine test score dependent variable constructs was performed to visually inspect for outliers. The boxplots indicated that two variables contained outliers, GATELA (6 outliers, 4.3%) and GATEMATH (4 outliers, 2.9%). The variables were standardized to check for the presence of extreme outliers ($z$-score of ± 3.3). No extreme values were found. Since all outliers were in acceptable ranges of their associated constructs and less than 5% of the data were missing on any one construct, it was determined that outliers were not affecting the dataset (McKnight et al., 2007). All records were retained for analysis and the outlier assumption was not violated.

Since the sample sizes for the two groups of arts-based curriculum vs. standard curriculum were not markedly different, investigation of homogeneity of variance-covariance matrices was not necessary. However, an additional check was made during inferential analysis with the Box’s $M$ test using SPSS. If the significance value on this test is less than .001, then robustness is not guaranteed and the assumption of homogeneity of variance-covariance matrices may be violated (Tabachnick & Fidell, 2007). The significance value of Box’s $M$ test for this study was $p = .01$; therefore, the assumption was confirmed as not violated.

Linearity was investigated via scatterplots between all pairs of the nine dependent variables used in the study. The assumption of linearity was not violated.

Tolerance levels were investigated for evidence of multicollinearity for the dependent measures combined over groups. All tolerance values were greater than .001; therefore, the assumption of multicollinearity was not violated.
Descriptive Statistics on Imputed Raw and Standardized Scores

Scores from two different assessment measures, the TCAP, grades 4 and 8, and the Gateway assessment relating to grades 9-12 were used. Therefore, all nine of the test score dependent variables were standardized in order to make the scores similar for comparison during inferential analysis. Table 5 presents descriptive measures of central tendency of the “raw” nonstandardized scores for the nine test score dependent variables.

Table 5

*Measures of Central Tendency for Dependent Variables of Test Scores Originally Obtained for Study (Raw Scores; N = 139)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Mdn</th>
<th>Sample Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCAP4LA</td>
<td>56.72</td>
<td>28.48</td>
<td>64.00</td>
<td>1 – 98</td>
</tr>
<tr>
<td>TCAP4 MATH</td>
<td>57.99</td>
<td>29.35</td>
<td>64.00</td>
<td>1 – 99</td>
</tr>
<tr>
<td>TCAP4SCIENCE</td>
<td>52.08</td>
<td>27.14</td>
<td>54.00</td>
<td>1 – 98</td>
</tr>
<tr>
<td>TCAP8LA</td>
<td>54.31</td>
<td>28.32</td>
<td>57.00</td>
<td>1 – 99</td>
</tr>
<tr>
<td>TCAP8MATH</td>
<td>53.12</td>
<td>28.89</td>
<td>58.00</td>
<td>1 – 99</td>
</tr>
<tr>
<td>TCAP8SCIENCE</td>
<td>52.47</td>
<td>27.16</td>
<td>53.00</td>
<td>1 – 99</td>
</tr>
<tr>
<td>GATELA</td>
<td>42.68</td>
<td>9.14</td>
<td>46.00</td>
<td>13 – 55</td>
</tr>
<tr>
<td>GATEMATH</td>
<td>39.20</td>
<td>9.18</td>
<td>41.00</td>
<td>10 – 54</td>
</tr>
<tr>
<td>GATESCIENCE</td>
<td>37.76</td>
<td>9.31</td>
<td>39.00</td>
<td>16 – 53</td>
</tr>
</tbody>
</table>

Table 6 presents descriptive measures of central tendency of the standardized scores for the nine test score variables. The standardized scores were used during profile analysis.
Table 6

*Measures of Central Tendency for Standardized Dependent Variables of Test Scores Used During Inferential Analysis (N = 139)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Mdn</th>
<th>Sample Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCAP4LA</td>
<td>0.00</td>
<td>1.00</td>
<td>0.25</td>
<td>-1.96 – 1.44</td>
</tr>
<tr>
<td>TCAP4 MATH</td>
<td>0.00</td>
<td>1.00</td>
<td>0.20</td>
<td>-1.94 – 1.40</td>
</tr>
<tr>
<td>TCAP4SCIENCE</td>
<td>0.00</td>
<td>1.00</td>
<td>0.07</td>
<td>-1.88 – 1.69</td>
</tr>
<tr>
<td>TCAP8LA</td>
<td>0.00</td>
<td>1.00</td>
<td>0.09</td>
<td>-1.88 – 1.58</td>
</tr>
<tr>
<td>TCAP8MATH</td>
<td>0.00</td>
<td>1.00</td>
<td>0.17</td>
<td>-1.80 – 1.59</td>
</tr>
<tr>
<td>TCAP8SCIENCE</td>
<td>0.00</td>
<td>1.00</td>
<td>0.02</td>
<td>-1.89 – 1.71</td>
</tr>
<tr>
<td>GATELA</td>
<td>0.00</td>
<td>1.00</td>
<td>0.36</td>
<td>-3.25 – 1.35</td>
</tr>
<tr>
<td>GATEMATH</td>
<td>0.00</td>
<td>1.00</td>
<td>0.20</td>
<td>-3.18 – 1.61</td>
</tr>
<tr>
<td>GATESCIENCE</td>
<td>0.00</td>
<td>1.00</td>
<td>0.13</td>
<td>-2.34 – 1.64</td>
</tr>
</tbody>
</table>

Findings

Profile analysis with a Doubly-multivariate design was used to infer statistically significant differences in the dependent test score variables between the two independent student groups of (a) arts-based curriculum vs. (b) standard curriculum, across the three independent variable time periods of (a) grade 4 (year 2000), (b) grade 8 (year 2004), and (c) grades 9-12 (Gateway passing proficiency score from years 2004-2008). Scores for each of the three subjects (language arts, math, and science) were the dependent variables. Profile analysis is a variation of multivariate analysis of variance (MANOVA). It is applied to situations when there are several dependent variables, each measured on
the same scale. The Doubly-multivariate extension of profile analysis includes analysis of several dependent variables at several different times (repeated measures).

Specifically this research will use the profile analysis Doubly-MANOVA design.

Standardized scores were used in all inferential analyses. Profile analysis Doubly MANOVA was used to infer differences between score trends (Hypothesis 1), differences between the two independent groups of art-based curriculum vs. standard curriculum (Hypothesis 2), and differences between the three standardized dependent measures of (a) language arts scores, (b) mathematics scores, and (c) science scores (Hypothesis 3).

**Inferential Analysis Related to Hypothesis 1**

**Research Question 1:** Is there a difference in the trend over the three test periods as relates to the arts-based curriculum student group vs. the standard education curriculum student group?

**Null Hypothesis 1:** There are no statistically significant differences in any of the comparable piecewise slopes of the two independent groups of arts-based students vs. standard education students on the combined dependent variables of (a) language arts scores, (b) mathematics scores, and (c) science scores.

**Alternative Hypothesis 1:** There are statistically significant differences in at least one pair of the comparable piecewise slopes of the two independent groups of arts-based students vs. standard education students on the combined dependent variables of (a) language arts scores, (b) mathematics scores, and (c) science scores.

Profile analysis was used to investigate Hypothesis 1 via the results of the test for piecewise parallelism. Scores for each of the three academic subjects were combined for
each year of study. Grade level by group interaction (deviation from parallelism) indicated statistical significance, $F(2, 410) = 3.171, p = .043$, partial $\eta^2 = .015$.

![Graph](image)

**Figure 1.** Chart of estimated marginal means of student groups (Arts-based curriculum vs. Standard curriculum) for average scores across all three academic subjects according to each test year, as relates to Hypothesis 1 (parallelism).

Figure 1 presents a chart of the estimated marginal means of the student groups according to combined average test scores according to test year. It can be seen that each student group’s trend moves in opposition from the time of the first testing year (grade 4) to the second testing year (grade 8), and from the time of the second testing to the third testing year (grades 9-12).
Post hoc analysis was performed utilizing three separate independent samples t-tests with standardized dependent variables of test year (grade 4, 8, and 9-12) and the independent variable of student group (arts-based vs. standard curriculum). All t-tests were significant. Arts-based students had higher grade 4 overall standardized scores ($M = 0.21, SD = 0.94$) than did the standard curriculum students ($M = -0.21, SD = 1.02$), $t(415) = 4.388, p < .0005$. Arts-based students had higher grade 8 overall standardized scores ($M = 0.27, SD = 0.94$) than did the standard curriculum students ($M = -0.26, SD = 0.99$), $t(415) = 5.57, p < .0005$. Arts-based students had higher grade 9-12 overall standardized scores ($M = 0.29, SD = 0.92$) than did the standard curriculum students ($M = -0.29, SD = 0.92$), $t(415) = 6.215, p < .0005$.

Null Hypothesis 1 was rejected as there was sufficient evidence to indicate that the two student groups of arts-based curriculum vs. standard curriculum deviated from parallelism across the combined grade level scores of the three academic subjects of a) language arts, b) mathematics, and c) science.

*Inferential Analysis Related to Hypothesis 2*

**Research Question 2**: Is there a difference among the two student groups on overall test scores?

**Null Hypothesis 2**: There is no statistically significant difference in the two student groups on when scores are averaged over all three competency tests.

**Alternative Hypothesis 2**: There is a statistically significant difference in the two student groups on when scores are averaged over all three competency tests.
Profile analysis was used to investigate Hypothesis 2 via the results of the test for differences in levels. The test of levels asks “Does one group score higher on average across all measures or time points?” The “Tests of Between Subjects Effects” table from the SPSS results was reviewed for significant differences between the student groups of arts-based curriculum vs. standard curriculum as relates to the test scores averaged over all three competency tests (grade 4, grade 8, and grades 9-12). Results were significant, $F(1, 2) = 34.21, p < .0005$. Investigation of the estimated marginal means for the two student groups indicated that the overall standardized mean test score values for the arts-based curriculum group was higher ($M = .257, SE = .062$) than the overall mean test score values for the standard curriculum group ($M = -.253, SE = .061$). Levene’s test for equal variances indicated non-significance, and thus indicated that the groups had homogenous variances, a requirement for robust comparison of the two student groups. It can be seen from Figure 1 that the average standardized scores for the arts-based student group were higher across all grade levels.

Null Hypothesis 2 was rejected as there was sufficient evidence to indicate significant differences between the student groups of arts-based curriculum vs. standard curriculum as related to the test scores averaged over all three competency tests (grade 4, grade 8, and grades 9-12).

*Inferential Analysis Related to Hypothesis 3*

*Research Question 3:* Is there a difference between the standardized values of the three types of test scores (a) language arts, (b) mathematics, and (c) science when averaged over the two independent student groups?
**Null Hypothesis 3:** There is no statistically significant difference between any of the three types of standardized test scores (a) language arts, (b) mathematics, or (c) science, when evaluated over the two independent student groups.

**Alternative Hypothesis 3:** There is a statistically significant difference between at least one pair of the standardized test scores (a) language arts, (b) mathematics, or (c) science, when evaluated over the two independent student groups.

Profile analysis was used to investigate Hypothesis 3 via the results of the test for flatness. The test for flatness investigates if results changed over time or across the different dependent variables (language arts, math, or science). Results were statistically significant $F (4, 820) = 11.85, p < .0005$, partial $\eta^2 = .064$.

Post hoc analysis using univariate ANOVA and the Tukey HSD test indicated statistically significant differences in standardized mean scores between language arts ($M = 0.297, SD = 0.97$) and math ($M = -0.072, SD = 0.974$); and between language arts and science ($M = -0.225, SD = 0.989$). Model significance was $F (2, 414) = 10.489$, $p < .0005$ for grades 9-12. No statistically significant differences were found for test scores as relates to grades 4 or 8.
Figure 2. Chart of estimated marginal means of academic subject groups (language arts, math, and science) for average scores across both student groups (arts-based vs. standard curriculum) according to each test year, as relates to Hypothesis 3 (flatness).

Figure 2 presents a graphical representation of the findings for Hypothesis 3. It can be seen that language arts scores are much higher than both the math and science scores according to the Gateway Test results (grade 9-12 scores). However, no interaction between the student groups of arts-based vs. non-arts-based was noted in the score differences for this test, only differences in the subject scores.

Null Hypothesis 3 was retained as there was not sufficient evidence to indicate a statistically significant difference between at least one pair of the standardized test scores,
(a) language arts, (b) mathematics, or (c) science, when evaluated over the two independent student groups.

Additional Inferential Analysis via MANCOVA for Control of Student Group Differences in Grade 4 Test Scores

Post hoc analyses utilizing three separate independent samples t-tests with the standardized dependent variables of test year (grade 4, grade 8, and grade 9-12) and the independent variable of student group (arts-based vs. standard curriculum) all indicated statistical significance. Arts-based students had higher grade 4 overall standardized scores ($M = 0.21, SD = 0.94$) than did the standard curriculum students ($M = -0.21, SD = 1.02$), $t(415) = 4.388, p < .0005$. Arts-based students had higher grade 8 overall standardized scores ($M = 0.27, SD = 0.94$) than did the standard curriculum students ($M = -0.26, SD = 0.99$), $t(415) = 5.57, p < .0005$. Arts-based students had higher grade 9-12 overall standardized scores ($M = 0.29, SD = 0.92$) than did the standard curriculum students ($M = -0.29, SD = 0.92$), $t(415) = 6.215, p < .0005$.

It could be concluded that differences between the two student groups were initially evident in the Grade 4 testing period, i.e., that the grade 4 arts-based students had higher grades than the non-arts-based students before starting the arts-based curriculum in grade 5. In order to control for the test score difference between the two student groups, an additional analysis was performed using multivariate analysis of covariance (MANCOVA) with grade 4 standardized test scores as the covariate. Independent factors of student group (arts-based vs. non-arts-based) and subject (language arts, mathematics, or science) were used as independent variables. Two dependent variables of (a)
standardized grade 8 scores and (b) standardized grade 9-12 scores were used in the analysis. SPSS GLM was used for MANCOVA analysis. The values of $\eta^2$ and associated confidence limits were found using Smithson’s NoncF3.sps syntax for main effects, interaction, and the covariate. Table 7 presents descriptive statistics for the standardized study variables used in the MANCOVA analysis.
Table 7

Descriptive Statistics for Standardized Study Variables Used During Confirmatory MANCOVA, Categorized by Dependent Variable, Factor of Student Group, and Factor of Subject

<table>
<thead>
<tr>
<th>Dependent Variable/Student Group/Subject</th>
<th>( M )</th>
<th>( SD )</th>
<th>( n )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grade 8 Scores</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arts-based students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language arts</td>
<td>0.268</td>
<td>0.947</td>
<td>69</td>
</tr>
<tr>
<td>Math</td>
<td>0.269</td>
<td>0.977</td>
<td>69</td>
</tr>
<tr>
<td>Science</td>
<td>0.258</td>
<td>0.919</td>
<td>69</td>
</tr>
<tr>
<td>Total</td>
<td>0.265</td>
<td>0.944</td>
<td>207</td>
</tr>
<tr>
<td>Non-arts-based students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language arts</td>
<td>-0.193</td>
<td>1.021</td>
<td>70</td>
</tr>
<tr>
<td>Math</td>
<td>-0.278</td>
<td>1.013</td>
<td>70</td>
</tr>
<tr>
<td>Science</td>
<td>-0.313</td>
<td>0.935</td>
<td>70</td>
</tr>
<tr>
<td>Total</td>
<td>-0.262</td>
<td>0.987</td>
<td>210</td>
</tr>
<tr>
<td>Both arts-based and non-arts-based groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language arts</td>
<td>0.036</td>
<td>1.009</td>
<td>139</td>
</tr>
<tr>
<td>Math</td>
<td>-0.006</td>
<td>1.029</td>
<td>139</td>
</tr>
<tr>
<td>Science</td>
<td>-0.030</td>
<td>0.968</td>
<td>139</td>
</tr>
<tr>
<td>Total</td>
<td>0.000</td>
<td>1.000</td>
<td>417</td>
</tr>
<tr>
<td><strong>Grade 12 Scores</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arts-based students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language arts</td>
<td>0.568</td>
<td>0.827</td>
<td>69</td>
</tr>
<tr>
<td>Math</td>
<td>0.269</td>
<td>0.889</td>
<td>69</td>
</tr>
<tr>
<td>Science</td>
<td>0.044</td>
<td>0.978</td>
<td>69</td>
</tr>
<tr>
<td>Total</td>
<td>0.294</td>
<td>0.921</td>
<td>207</td>
</tr>
<tr>
<td>Non-arts-based students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language arts</td>
<td>0.031</td>
<td>1.031</td>
<td>70</td>
</tr>
<tr>
<td>Math</td>
<td>-0.408</td>
<td>0.943</td>
<td>70</td>
</tr>
<tr>
<td>Science</td>
<td>-0.490</td>
<td>0.933</td>
<td>70</td>
</tr>
<tr>
<td>Total</td>
<td>-0.289</td>
<td>0.992</td>
<td>210</td>
</tr>
<tr>
<td>Both arts-based and non-arts-based groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language arts</td>
<td>0.297</td>
<td>0.970</td>
<td>139</td>
</tr>
<tr>
<td>Math</td>
<td>-0.072</td>
<td>0.974</td>
<td>139</td>
</tr>
<tr>
<td>Science</td>
<td>-0.225</td>
<td>0.989</td>
<td>139</td>
</tr>
<tr>
<td>Total</td>
<td>0.000</td>
<td>1.000</td>
<td>417</td>
</tr>
</tbody>
</table>
Assumptions for MANCOVA analysis are the same as for MANOVA or Profile Analysis. Additional assumptions investigated for the MANCOVA are presented as follows: Box’s Test of Equality of Variances was not significant \((p = .548)\) indicating that the covariance matrices for each cell were similar. Sphericity was not an issue for this MANCOVA analysis because only two dependent variables were used (Tabachnick 
& Fidell, 2007). Levene’s test of Equality of Error Variances indicated that the error variance was equal across all groups for the dependent variables of Grade 8 scores \((p = .119)\) and Grade 9-12 scores \((p = .075)\). Univariate and multivariate within-cell outliers were not present at the \(\alpha = .001\) level.

A 2x 3 between-subjects multivariate analysis of covariance was performed on the two dependent variables (DVs) of (a) standardized grade 8 scores, and (b) standardized grade 9-12 scores. Adjustment was made for the covariate of standardized grade 4 scores. The independent variables were student group (arts-based vs. non-arts based) and subject (language arts, mathematics, and science).

According to the Wilk’s criterion, the combined DVs were significantly related to the covariate of Grade 4 scores, approximate \(F(2, 409) = 505.80, p < .0005\), to student group, \(F(2, 409) = 11.22, p < .0005\), and to subject, \(F(4, 818) = 13.10, p < .0005\). The interaction effect (group X subject) was not significant for the combined DVs, \(F(4, 818) = 0.83, p = .514\). There was a strong association between the combined DVs and the covariate of standardized grade 4 scores, \(\eta^2 = .71\), with confidence limits from .67 to .75. Much smaller associations were found between combined DVs and the main effect of subject, \(\eta^2 = .06\), with confidence limits from .03 to .09, and the association
between the main effect of student group and the combined DVs, $\eta^2 = .05$, with confidence limits from .02 to .10. Table 8 presents the results of the multivariate tests.

Table 8

*MANCOVA Multivariate Results on Combined Dependent Variables (Standardized Grade 8 Scores and Standardized Grade 12 Scores)*

<table>
<thead>
<tr>
<th>Effect</th>
<th>Wilks’ Lambda</th>
<th>$F$</th>
<th>$p$</th>
<th>$\eta^2$</th>
<th>95% CL for $\eta^2$</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standardized grade 4 scores</td>
<td>0.288</td>
<td>505.76</td>
<td>&lt;.0005</td>
<td>.71</td>
<td>(.67 , .75)</td>
<td>1.00</td>
</tr>
<tr>
<td>Student Group</td>
<td>0.948</td>
<td>11.22</td>
<td>&lt;.0005</td>
<td>.05</td>
<td>(.02, .10)</td>
<td>0.99</td>
</tr>
<tr>
<td>Subject</td>
<td>0.883</td>
<td>13.10</td>
<td>&lt;.0005</td>
<td>.06</td>
<td>(03, .09)</td>
<td>1.00</td>
</tr>
<tr>
<td>Student Group X Subject</td>
<td>0.992</td>
<td>0.82</td>
<td>.514</td>
<td>.004</td>
<td>(.000, .012)</td>
<td>0.26</td>
</tr>
</tbody>
</table>

*Note. 95% CL = 95% Confidence Limits.*

To investigate more specifically the power of the covariate to adjust dependent variables, multiple regressions were performed for each DV in turn, with the covariate acting as a predictor. The covariate of standardized grade 4 scores provided significant adjustment to standardized grade 8 scores. The $B$ value of .82 (confidence interval from .77 to .88) for standardized grade 4 scores was significantly different from zero, $t(410) = 30.41, p < .0005$, as was the $B$ value of .23 (confidence interval from .05 to .41) for arts-based students, $t(410) = 2.48, p = .014$. The covariate also provided adjustment to the standardized grade 12 scores with a $B$ value of .71 (confidence interval from .65 to .77) $t(410) = 22.26, p < .0005$. For standardized grade 9-12 scores, the arts-based students reached statistical significance with $B = .239$ (confidence interval from .03 to
The subject of language arts was also significant for standardized grade 12 scores with $B = .415$ (confidence interval from .21 to .63), $t(410) = 3.89, p < .0005$.

Effects of student group and subject on the DVs after adjustment for the covariate of standardized grade 4 scores were investigated with univariate ANOVA effects for individual factors and factor interaction, and for the covariate. Univariate analysis revealed that a statistically significant difference was present for the covariate of standardized grade 4 scores on the dependent variable of standardized grade 8 scores, $F(1, 410) = 924.43, p < .0005, \eta^2 = .69$, with confidence limits from .65 to .73. The covariate was also statistically significant on the dependent variable of standardized grade 9-12 scores, $F(1, 410) = 495.68, p < .0005, \eta^2 = .55$, with confidence limits from .49 to .60. Tests of between-subjects effects indicated that the arts-based student group had significantly higher scores (adjusted mean = 0.091, $SE = .038$) than the non-arts based group (adjusted mean = -0.089, $SE = .038$) for standardized grade 8 scores, $F(1, 410) = 11.15, p = .001$. The arts-based group also had significantly higher scores (adjusted mean = 0.144, $SE = .044$) than the non-arts based group (adjusted $M = -1.142$, $SE = .044$) for standardized grade 9-12 scores, $F(1, 410) = 20.41, p < .0005$. Subject had a statistically significant effect on standardized grade 9-12 scores, $F(2, 410) = 18.51, p < .0005$. A review of the estimated marginal means for grade 9-12 subject indicated that language arts had a higher score (adjusted mean = 0.267, $SE = .054$) than either math (adjusted mean = -0.129, $SE = .054$) or science (adjusted mean = -0.135, $SE = .054$).

Table 9 presents the findings of the MANCOVA analysis.
### Table 9

**MANCOVA Univariate Results According to Dependent Variables (Standardized Grade 8 Scores and Standardized Grade 12 Scores)**

<table>
<thead>
<tr>
<th>Effect</th>
<th>$F$</th>
<th>$p$</th>
<th>$\eta^2$</th>
<th>95% CL for $\eta^2$</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standardized grade 4 scores</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 8</td>
<td>924.43</td>
<td>&lt;.0005</td>
<td>.69</td>
<td>(.64, .73)</td>
<td>1.00</td>
</tr>
<tr>
<td>Grade 12</td>
<td>495.68</td>
<td>&lt;.0005</td>
<td>.55</td>
<td>(.49, .60)</td>
<td>1.00</td>
</tr>
<tr>
<td>Student Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 8</td>
<td>11.15</td>
<td>.001</td>
<td>.03</td>
<td>(.00, .06)</td>
<td>0.92</td>
</tr>
<tr>
<td>Grade 12</td>
<td>20.41</td>
<td>&lt;.0005</td>
<td>.05</td>
<td>(.02, .09)</td>
<td>1.00</td>
</tr>
<tr>
<td>Subject</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 8</td>
<td>2.62</td>
<td>.074</td>
<td>.01</td>
<td>(.00, .04)</td>
<td>0.52</td>
</tr>
<tr>
<td>Grade 12</td>
<td>18.51</td>
<td>&lt;.0005</td>
<td>.08</td>
<td>(.04, .13)</td>
<td>1.00</td>
</tr>
<tr>
<td>Student Group X Subject</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Grade 8</td>
<td>0.86</td>
<td>.423</td>
<td>.004</td>
<td>(.000, .012)</td>
<td>0.20</td>
</tr>
<tr>
<td>Grade 12</td>
<td>0.95</td>
<td>.389</td>
<td>.005</td>
<td>(.000, .023)</td>
<td>0.21</td>
</tr>
</tbody>
</table>

**Note.** 95% CL = 95% Confidence Limits.

**Comparison of Profile Analysis and MANCOVA Findings**

MANCOVA findings confirm that statistically significant differences existed between the student groups of arts-based vs. non-arts-based for grades 8 and 9-12, with the arts-based groups scoring higher. MANCOVA adjusted scores for grades 8 and 9-12 by using grade 4 scores as a covariate, and the findings remained significant. The MANCOVA confirmed Hypothesis 1 and 2 that arts-based students scored higher overall than the non-arts based students. An additional finding on the MANCOVA analysis was that language arts was statistically significantly higher for grade 9-12 scores than the
other two subjects when both student groups were included in the effect. Therefore, Hypothesis 3 was further supported by MANCOVA analysis. Interactions between the student group and subject effects were not observed in the MANCOVA analysis.
CHAPTER V

CONCLUSIONS, DISCUSSIONS, AND IMPLICATIONS

Introduction

The relationship between a participatory arts-in-education program and improved academic achievement has raised many questions among researchers (Davis, 1999; Eisner, 1999; Hetland & Winner, 2001). The extensive review of literature in Chapter II revealed that the role of arts in education has been problematic (Berube, 1999). The research basis for claims about the effects of art experiences on academic achievement revealed mixed results, some positive (Burton et al., 1999; Catterall et al., 1999; Hetland & Winner, 2001; Podlozny, 2000); others less so (Butzlaff, 2000; Graham et al., 2002; Winner & Cooper, 2000). No evidence revealed a causal relationship between arts education and improved academic achievement (Winner & Cooper, 2000). Therefore, the review of literature provided a sound argument for researching the relationship between participation/non-participation in an arts-based public school and academic achievement over time.

The purpose of this study was to determine whether attending an arts-based middle school positively impacted academic achievement as measured by standardized tests. The study examined achievement data from the grade four and grade eight Tennessee Comprehensive Assessment Program (TCAP) and the grade nine through twelve Gateway Test to determine whether patterns of improved academic achievement
were discernable for students who attended an arts-based middle school for four years. The population for this study consisted of sixty-nine students who graduated from Mt. Pleasant High School (MPHS) in 2008 and who also attended Mt. Pleasant Middle School of the Visual and Performing Arts (MPMSVPA) and seventy students who graduated from other high schools in the county and did not attend MPMSVPA.

Profile analysis with a Doubly-multivariate design was used to infer statistically significant differences in the dependent test score variables between the two independent student groups of (a) arts-based curriculum vs. (b) standard curriculum; across the three independent variable time periods of (a) grade 4 (year 2000), (b) grade 8 (year 2004), and (c) grades 9-12 (Gateway passing proficiency score from years 2004-2008). Scores for the three subjects (language arts, math, and science) were the dependent variables. Specifically, this research used the profile analysis Doubly-MANOVA design.

Conclusions

Difference in Trend

In order to determine whether a difference in the trend over the three test periods between the arts-based curriculum student group and the standard education curriculum student group existed, scores for each of the three academic subjects (language arts, mathematics, and science) were combined for each year of study. The results showed that each student group’s trend moved in opposition from the time of the first testing year (grade 4) to the second testing year (grade 8), and from the time of the second testing year to the third testing year (grades 9-12). The arts-based curriculum student group had higher grade 8 and grades 9-12 overall standardized scores than the standard curriculum
student group. This study replicated others in which a relationship between the arts and academic achievement was found (Burton et al., 1999; Eisner, 1999; Hetland & Winner, 2001). These studies affirm the impact and support the use of the arts to improve academic achievement. Moreover, the arts-based curriculum students in the current study outperformed the standard curriculum students on standardized tests.

**Difference in Overall Test Scores**

Test scores were averaged over all three competency tests for grade 8, and grades 9-12 to determine whether a difference existed between the arts-based curriculum student group and the standard curriculum student group. An investigation of the estimated marginal means indicated that the overall standardized mean test score values for the arts-based curriculum student group was higher than the overall standardized mean test score values for the standard curriculum student group. Additionally, the average standardized scores for the arts-based curriculum student group were higher across all grade levels. These findings support and extend previous research (Catterall et al., 1999, Tanner, 2007; Vaughn & Winner, 2000) which reported increased academic achievement through the use of the arts.

**Difference in Values of Test Scores**

The standardized values of the three types of test scores (language arts, mathematics, and science) were averaged over the two independent student groups to determine whether results changed over time or across different dependent variables. Differences in standardized mean scores were found between language arts and math and between language arts and science for grade 9-12 only. According to grades 9-12
Gateway Tests results, language arts scores were higher than both the math and science scores. These findings support the results of a study by Hetland and Winner (2001) which found no evidence that studying the arts causes improvement in academic achievement.

A comparison of the arts-based curriculum student group and the standard curriculum student group revealed differences in Research Hypothesis 1 and Research Hypothesis 2. This suggests a positive effect for using an arts-based curriculum to increase academic achievement. It may be important to teach arts within the standard curriculum. Future research could examine if there is an optimal method for teaching arts within the standard curriculum.

Implications for Schools

Studying the arts-based curriculum school and the standard curriculum schools and comparing students’ scores in the areas of language arts, mathematics, and science determined that student achievement test scores on the Tennessee Comprehensive Assessment Program (TCAP) and the Gateway Test are positively impacted through an arts-based curriculum. These results may be helpful for the future growth of arts-based programs. One recommendation would be for school systems to seek grants in order to further instruct students in the arts to promote greater academic achievement. Curriculum designers and principals need to align the arts objectives more closely to language arts, mathematics, and science objectives.
Implications for Future Research

A study of the effects of an arts-based curriculum that connects core subjects to the arts and state curriculum objectives would be of interest. An investigation of an arts-based curriculum along with brain-based research and differentiated instruction would be a logical progression for educators and policy makers. A study of the effect of an arts-based program from kindergarten on academic achievement would also be of interest.

Additional studies are required and more assessments needed for future revisions of the arts-based curriculum in the county included in this study. A recommended future study might include examining the impact of an arts-based curriculum by gender and ethnicity. It might also be interesting to examine attitudes toward self and school between these two groups. Additionally, the impact that an arts curriculum has on reading and social studies scores might be studied. It might be interesting to see which type of art has the biggest impact on which academic subject scores. The impact of the arts on student motivation, discipline, attendance, and graduation rate could be examined as well, and might prove as significant as academic achievement.
CHAPTER VI

REFERENCES


http://findarticles.com/p/articles/mi_moHUL/is_4_33/ai_n6007490


APPENDIX A

IRB APPROVAL
To: Melissa McClure  
mcclure1960@directv.net  
Dr. Mary Bess Dunn  
Dept.: Education: Curriculum and Instruction

From: Dr. G. Pamela Burch-Sims, Chair, Institutional Review Board

Re: Protocol #HS2009-2106

Date: Saturday, March 28, 2009

The document listed below has been carefully reviewed and found to be in compliance with OPRR document title 45, Code of Federal Regulations part 46, the protection of human subjects, as amended by Federal policy, effective August 19, 1991. This project is approved as it presents minimal or no research risks to the pool of impending human subjects. Please make note, that any deviations in the administration of the protocol, accidental or otherwise should be reported to the IRB as soon as possible. The FWA for Tennessee State University is #FWA00007692, which is effective from July 16, 2007 through July 16, 2010.

"The Effects of an Arts-Based Curriculum on the Academic Achievement of Middle School Students"

This approval is valid for one year from the date indicated above. Continuation of research beyond that date requires re-approval by the Institutional Review Board.

Please e-mail irb@tnstate.edu for additional information.
APPENDIX B

PERMISSION FROM DIRECTOR OF SCHOOLS
Maury County Board of Education  
501 West 8th Street  
Columbia, Tennessee 38401

Dear Mr. Hickman:  
As a classroom teacher at Mt. Pleasant Middle School of the Visual and Performing Arts, I am requesting permission to collect, analyze, and report data pertinent to Maury County Schools for the completion of my doctoral dissertation from Tennessee State University.

The purpose of my study is to determine whether attending an arts-based middle school positively impacts student academic achievement as measured by standardized achievement tests. My study will involve analyzing data (TCAP scores and Gateway test scores) from the 2008 graduates from Mt. Pleasant High School who also attended Mt. Pleasant Middle School of the Visual and Performing Arts as well as a random sample of graduates from the other county high schools who did not attend MPMSVPA. As the research examiner, I will have sole access to all data. Data will be numerically coded to ensure anonymity.

I respectfully request your approval in writing on official letterhead.

Thank you for your assistance.

Sincerely,

Melissa D. McClure  
Doctoral Student, Tennessee State University  
Teacher, Mt. Pleasant Middle School
December 11, 2008

Ms. Melissa D. McClure
1960 Odd Fellows Hall Road
Pulaski, TN 38478

Dear Ms. McClure;

I have received your request to collect, analyze, and report data pertinent to Maury County Schools for the completion of your doctoral dissertation from Tennessee State University.

I would ask that when you are ready to access the data, please contact either Dr. Debbie Wiles or me so that we can be assured that anonymity is ensured and that no student’s identification is being revealed. We will gladly work with you to provide the needed data. We would also ask to be provided a copy of the results of your study.

Thank you for your dedication to Maury County Public Schools.

Sincerely,

Mary Ruth Campbell
Assistant Director of Schools

Cc: Mr. Edward A. Hickman, Director
APPENDIX C

LETTER TO PRINCIPALS
To the Principals of Maury County Schools:
After having received written permission from Director Eddie Hickman to collect, analyze, and report data pertinent to Maury County Schools, I am requesting permission to review your school’s student records in order to collect the required data for the completion of my doctoral dissertation from Tennessee State University.

The purpose of my study is to determine whether attending an arts-based middle school positively impacts student academic achievement as measured by standardized achievement tests. My study will involve analyzing data (TCAP scores and Gateway test scores) from the 2008 graduates from Mt. Pleasant High School who also attended Mt. Pleasant Middle School of the Visual and Performing Arts as well as a random sample of graduates from the other county high schools who did not attend MPMSVPA. As the research examiner, I will have sole access to all data. Data will be numerically coded to ensure anonymity.

I will be contacting you by phone to set up a time that is convenient for me to review and collect data from your school’s student records.

Thank you for your assistance.

Sincerely,

Melissa D. McClure
Doctoral Student, Tennessee State University
Teacher, Mt. Pleasant Middle School