

A Quantitative Examination of School Configurations in Tennessee Using Sixth Grade
Math, Reading, Science, and Social Studies Standardized Test Scores

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by
Whitney J. Ramsey
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Dr. James Lampley
Dr. Martha Collins
Dr. Eric Glover
Dr. Pamela Scott

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ABSTRACT

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Whitney J. Ramsey

The purpose of this study was to determine if there were differences in standardized test scores, expressed as percentage passing, in math, reading-language arts, science, and social studies by comparing 6th grade students in K-8 schools with those in 6-8 schools. The data were gathered from an analysis of 6th grade students' scores on the 2006-2007 TCAP standardized assessment test in the state of Tennessee. The relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the below proficient, proficient, or advanced level in each subject area was examined.

The analysis was based on 5 research questions. A *t*-test for independent samples was used to identify the relationships between the independent variables, configuration of the school (K-8 or 6-8), and the dependent variables, the percent of students scoring below proficient, proficient, or advanced. A chi square analysis was used to identify the relationship between the proportion of K-8 schools meeting AYP versus the proportion of 6-8 schools meeting AYP.

The study showed no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the below proficient level in math, reading-language arts, and social studies. Similarly, there was not a significant difference between grade

configuration (6-8 or K-8) and percent of 6th grade students scoring at the proficient level in math and reading-language arts and the advanced level in math, reading-language arts, and science. However, there was a significant relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the below proficient level and the proficient level in science and the percent of 6th grade students scoring at the proficient level and advanced level in social studies. In science, a lower percentage of 6th grade students in K-8 schools scored below proficient than did 6th grade students in 6-8 schools. In science, a higher percentage of 6th grade students in K-8 schools scored proficient than did 6th grade students in 6-8 schools. In social studies, a higher percentage of 6th grade students in K-8 schools scored proficient than did 6th grade students in 6-8 schools. However, a higher percentage of 6th grade students in 6-8 schools scored advanced than did 6th grade students in 6-8 schools. The study showed a significant difference in the proportion of K-8 schools meeting AYP versus the proportion of 6-8 schools meeting AYP.

DEDICATION

This work is dedicated to all my wonderful family and friends who traveled this journey with me. My dad, Allen, for his love and support. His strong belief in hard work has made me a stronger individual. My sister, Courtney, my best friend who gave me unconditional love and support during this time. My brothers, Justin and Forrest, who encouraged me to be my best. My grandmothers, Elizabeth and Jean, who always believed in me and encouraged me to follow my dreams. Justin thank you for your constant encouragement and support during this process. I also dedicate this work to all the teachers who have touched my life. The impact of teachers should never be underestimated.

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CHAPTER 1

INTRODUCTION

In January 2002, the No Child Left Behind Act of 2001 was signed into law by President George W. Bush. This act reauthorized and amended federal education programs established under the Elementary and Secondary Education Act of 1965. The No Child Left Behind Act established new standards of accountability and achievement for individual students, schools, and school systems. The focus of the No Child Left Behind Act was school reform based on accountability, flexibility, research-based education, and parent options. The goal of No Child Left Behind was that all students in all schools should be academically proficient in math, reading, and language arts by 2014 (Tennessee Department of Education, 2008a).

Because of the emphasis created by No Child Left Behind on accountability and achievement, administrators and educators searched for best practices that would aid in creating an environment where students could succeed academically. Educators searched for data confirming the best way to provide a high-quality education for the children in their care and to make the best use of their educational funds. Many different factors contributed to the learning environment, including: the quality of teachers, administrators, teaching materials, and the physical quality of the building. One primary area of interest, however, was how best to configure the grades in K-12 schools (Howley, 2002).

At the beginning of the 20th century, school configurations in the United States began to change from an 8-year primary and 4-year secondary model to a junior high

school model that incorporated grades seven through nine because of the growing concern about meeting the academic and social needs of young adolescents (Cook, MacCoun, Muschkin, & Vigdor, 2007). During the 1950s and 1960s, more concerns were voiced about whether junior high schools were actually meeting the needs of those students. This produced the emergence of the middle school model, which generally served grades six through eight (Manning, 2000a). In the United States in 2004, there were over 15,000 public schools that served nearly nine million middle school aged students (Juvonen, Le, Kaganoff, Augustine, & Constant, 2004).

This study focused on the relationship between grade configuration of schools and student achievement on standardized tests. In the state of Tennessee each spring students in grades three through eight take the Tennessee Comprehensive Assessment Program (TCAP) achievement test to determine their academic competency. The 6th grade TCAP achievement test is a timed, multiple choice assessment that measures skills in reading, language arts, mathematics, science, and social studies. Student results are reported to parents, teachers, and administrators (Tennessee Department of Education, 2007a).

Statement of the Problem

Heightened accountability brought about by recent school reform that placed a greater emphasis on standardized test scores and achievement that created stressful challenges for school administrators and teachers across the country. Many educators searched for data confirming the best way to provide a high-quality education for their students. One area of interest was how best to configure the grades in local schools (Howley, 2002). Research on the effects of grade span on academic achievement was

very limited. This study focused on the grade configurations of schools and how they related student achievement on standardized tests.

The purpose of this study was to determine if there were differences in standardized test scores expressed as percentage passing in math, reading-language arts, science, and social studies by comparing 6th-grade students in K-8 schools with those in 6-8 schools. The data were gathered from an analysis of 6th-grade students' scores on the 2006-2007 TCAP standardized assessment test in the state of Tennessee.

Research Questions

The research questions in this study were designed to determine if there were significant differences in academic achievement between 6th grade students in K-8 and 6th grade students in 6-8 schools.

Research Question 1

Is there a relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring in each of the three classifications (below proficient, proficient, or advanced) in math on the TCAP achievement test?

Research Question 2

Is there a relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring in each of the three classifications (below proficient, proficient, or advanced) in reading-language arts on the TCAP achievement test?

Research Question 3

Is there a relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring in each of the three classifications (below proficient, proficient, or advanced) in science on the TCAP achievement test?

Research Question 4

Is there a relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring in each of the three classifications (below proficient, proficient, or advanced) in social studies on the TCAP achievement test?

Research Question 5

Is there a difference in the proportion of K-8 schools and 6-8 schools meeting Adequate Yearly Progress?

Significance of the Study

Because of the No Child Left Behind Act's emphasis on accountability and achievement, educators sought best practices to assist them in creating an environment where students could succeed academically.

It is important that educators and parents take a closer look at student scores on state mandated tests because they are taken very seriously in schools. Great pressures are put on teachers and students to perform on the tests. The test scores follow children for the rest of their school career. Educators must look at the students' progress to evaluate their mastery level of skills tested. Parents need to look at their child's individual progress and the child's progress relative to other students.

Additional research needed to be conducted to determine if there is a difference in standardized test scores in mathematics, reading, science, and social studies between 6th-grade students in K-8 schools and those in 6-8 schools.

Definitions of Terms

The following are definitions of terms used in this study:

1. *Adequate Yearly Progress (AYP)*: A measure of a school or school system's ability to meet required federal benchmarks with specific performance standards from year to year (Tennessee Department of Education, 2007a).
2. *Advanced Proficiency Level*: The demonstrated level of complex concepts and skills applied in the content area of the TCAP assessment test (Tennessee Department of Education, 2007c).
3. *Alignment with State Standards*: State assessments aligned with challenging academic content standards and challenging academic achievement standards. States were required under the previous law to develop or adopt standards in mathematics and reading-language arts. The more recent law also required the development of reading standards by 2005-2006 (U.S. Department of Education, 2002).
4. *Below Proficiency Level*: The demonstrated lack of understanding of the essential concepts and skills of the content area on the TCAP assessment test (Tennessee Department of Education, 2007c).
5. *Economically Disadvantaged*: As pertaining to this study, the group consisting of students who received free or reduced-priced meals (U.S. Department of Education, 2002).

6. *Instructional Levels*: Instructional levels are calculated from the lowest and highest grades in which students are reported in a school (Overview of Public Elementary and Secondary Schools and Districts).
7. *Junior High School*: Schools that serve grades 7 and 8 (Juvonen et al., 2004).
8. *Middle Grades*: Any range of grades from 5 to 8 (Juvonen et al., 2004).
9. *Middle School*: Schools that are typically configured to begin with the 6th grade and end with the 8th grade (Juvonen et al., 2004).
10. *No Child Left Behind*: A federally mandated bill that required all states to establish an accountability plan that held all schools and districts accountable for student performance (Executive Summary Accountability).
11. *Proficiency Level*: The demonstrated level of general understanding of the essential concepts and skills of the content area on the TCAP assessment test (Tennessee Department of Education, 2007c).
12. *State Report Card*: State produced and disseminated annual report cards that provide information on overall student achievement as well as information disaggregated by race, ethnicity, gender, English proficiency, migrant status, disability status, and low-income status (U.S. Department of Education, 2002).

Limitations and Delimitations

The instrument used to collect data in this study was the Tennessee Comprehensive Assessment Program (TCAP) achievement test administered by classroom teachers during a 3-week window in April of 2007. Following collection, data

for each school were posted on the Tennessee Department of Education website. Thus, this study was limited to School Report Card data from the 2006-2007 school year.

For the purposes of this study, mathematics, reading, science and social studies achievement was analyzed for middle schools in Tennessee. Within individual schools, teachers had different levels of mathematics, reading, science, and social studies expertise and years of teaching experience. Each school had a different school climate and resources unique to that school that might have affected the mathematics, reading, science, and social studies achievement.

Economically disadvantaged refers to the percentage of students who receive free or reduced price lunch and is a common measure of student poverty in educational research. This value had limits because of conditions unrelated to actual poverty levels, such as unwillingness for parents to apply for programs.

This study was delimited to the state of Tennessee, addressing data from 342 schools and focusing on 6th-grade students in the subject areas of math, reading-language arts, science and social studies. Only scores of those students were analyzed; therefore, generalizations were limited to this grade only. The students in this study attended schools that operated on a traditional calendar; therefore, the findings may not be generalizable to other groups.

Overview of the Study

This study was organized and presented in five chapters. Chapter 1 included the statement of the problem, definitions of terms, research questions, purpose and significance of the study, limitations, and delimitations of the study. Chapter 2 contains a

review of literature pertaining to the history of education in Tennessee, standardized testing, standardized testing in Tennessee, testing and accountability, school configurations, middle schools, and K-8 schools. Chapter 3 describes the research design and method used in the study. This chapter also includes information on the population, sample and selection procedures, instrumentation, data collection methods, data analysis planning, and a summary. Chapter 4 presents the analyses of the data in the form of narration, tables, and figures. This chapter also includes the null hypotheses related to each of the five research questions. Chapter 5 contains the summary of the findings, the conclusions, and recommendations for further study.

CHAPTER 2

REVIEW OF LITERATURE

Introduction

What is the best configuration of grades for middle school students? Research provided no definitive answers to the multitude of questions about grade span (Simonson, 2003). Franklin and Glascock (1996) stated that consensus on which grade configuration offered the best educational opportunities to students had not yet been made by educators. However, grade configuration was an area questioned by many in education as a probable factor affecting student achievement. Much concern regarding grade arrangements focused on the development levels and emotional needs of the various mixtures of students. Brown (2004) examined the transition to middle school and noted that because transitions were so significant in the lives of children, educators should carefully analyze the required transitions. If transitions hand and hand with configuration proved to interfere with student learning, educators needed to minimize those transitions.

According to Johnson and Johnson (2006), the No Child Left Behind Act brought changes that stemmed from the fear that schools were not producing students who possessed sufficient knowledge. This law established new standards of accountability and achievement for individual students, schools, and school systems. As a result of school reform efforts such as the No Child Left Behind Act standardized testing became one of the primary means of measuring student achievement in the United States (Johnson & Johnson). These test results were also a way to measure the effectiveness of

America's public schools. States, school systems, and individual schools were increasingly judged based on their performance on mandated tests.

The Tennessee Comprehensive Assessment Program (TCAP) achievement test is administered each spring to Tennessee's students in grades three through eight in order to measure school and student achievement (Tennessee Department of Education, 2007a). The TCAP Achievement Test is a mandated, timed, multiple choice assessment that measured the skills of 6th grade students in reading, language arts, mathematics, science, and social studies. TCAP test results are reported to parents, teachers, and administrators.

Current issues in Tennessee's public school system are related to those of school systems in different states throughout the country. Because the accountability provision of NCLB made it mandatory for all students to demonstrate proficiency in reading, language arts, and mathematics by the year 2014, the need to assess academic achievement outcomes within grade span configurations became even more vital (Tennessee Department of Education, 2007a). Federal and state governments demanded high academic achievement for all students, adequate yearly progress (AYP), and accountability in schools and school districts throughout the United States (U. S. Department of Education, 2004). Schools or school districts that failed to make adequate yearly progress faced consequences under NCLB. Therefore, school administrators and policy makers were challenged to design grade span configurations that produced academic outcomes consistent with local, state, and national educational goals.

A brief overview of the history of education in Tennessee, standardized testing in Tennessee, accountability, grade configuration of schools, middle schools, and K-8 schools is presented in the following literature review.

Education in Tennessee

In 1806, Congress of the United States required each state's township to set aside 600 acres of good land to be sold for the support of public schools, a requirement largely ignored by the townships. Of the 6,500,000 acres that should have been set aside, only 23,000 acres were actually sold. Because the land brought only one cent per acre, the money from the land sales was not enough to establish a single school. In 1829, the first public school law in Tennessee was passed, authorizing local taxes for the support of the common schools. Tennessee's first constitution did not mention public education; however, the third constitution in 1870 stated that the General Assembly was responsible for providing a state public school system and restored the common school fund. The Public School Law of 1873 was regarded as the parenting act of public education and provided the basic framework for Tennessee's system of public education. The General Assembly authorized secondary schools in 1891. In 1899, a second act authorized each county to establish at least one high school. Consequently, because of the expanded school system, the power of the county courts over local schools increased. The magistrates approved county school budgets, audited school expenditures, and required quarterly reports from the county boards of education. The General Education Act of 1901 provided revenue to support all levels of public education from elementary through college (*Tennessee Blue Book*, 2006).

In 2008, the State of Tennessee was comprised of 137 rural, urban, and suburban public school districts (Tennessee Department of Education, 2008b). There were 1,714 public schools serving grades PreK-12 in the state. According to the 2008 State Report Card, Tennessee served 925,898 students in PreK-12 grades and per pupil expenditure for the 2006-2007 school year was \$7,794 (Tennessee Department of Education, 2007b).

On the 2007 National Assessment of Educational Progress (NAEP) assessment, average scale score of students in Tennessee were slightly lower than the national scale scores in math, reading, and science. However, students in Tennessee scored higher than the national average on the writing NAEP assessment. The National Assessment of Educational Progress is the only nationally representative and continuing assessment of students across the United States. Assessments are conducted periodically in mathematics, reading, science, and writing. NAEP provided results on subject-matter achievement, instructional experiences, and school environments from populations of students and groups within those populations. NAEP results were based on representative samples of students in grades 4, 8, and 12 for the main assessments. In 2007, the eighth grade average scale score in math for students in Tennessee was 233 compared with the national average of 239 on the NAEP test. In reading, Tennessee's eighth grade average scale score was 259 compared with the national average of 261. The last NAEP assessment in science was given in 2005 and Tennessee's eighth grade average scale score was 145 compared with the national average of 147. However, on the NAEP writing assessment, Tennessee's eighth grade average scale score in writing was 156 compared with the National average of 154. NAEP results serve as a common

metric for all states and selected urban districts because NAEP assessments are administered uniformly across the country (U.S. Department of Education, 2008).

Standardized Testing

Standardized testing in different forms has been around for more than a century (Caruano, 1999). According to Amrein and Berliner (2003), various tests determined which immigrants could enter the United States at the turn of the 20th century. Popham (2001) reported that during World War I the military administered intelligence tests developed by French psychologist Alfred Binet, the creator of the first standardized IQ test, to evaluate and identify potential officers. During this period, men were assigned to duty according to their performance on the standardized tests. Young men in mass numbers had either been drafted or enlisted in the American armed forces; consequently, it soon became apparent that Binet's one-person-at-a-time testing approach was not practical. The army contacted Yerkes, president of the American Psychological Association, to develop a group-administrable test that would identify officer candidates. Yerkes and his colleagues designed 10 subtests known as the "Army Alpha" (Popham, 2001, p. 41). The subtests were made up of items requiring recruits to do such things as follow oral directions, identify appropriate analogies, reason mathematically, and choose appropriate synonyms or antonyms for selected vocabulary terms. The Army Alpha represented the first large-scale aptitude test to use multiple-choice test items. The army used the data to determine which recruits were sent to officer training, to the trenches to fight the war, or urged to leave the service.

After World War I, educational achievement tests similar to the Alpha began to appear in schools across the nation. The Stanford Achievement Test, developed by Terman in 1923, began the widespread use of standardized tests given to millions of school children over the next 80 years (Armstrong, 2006). In 1926, the first Scholastic Aptitude Test (SAT), based on the Army Alpha test, was administered to students. Popham (2001) reported that the mission of modern standardized achievement tests was not fundamentally different from the mission of Alpha, which was to “develop a set of items that will allow for fine-grained and accurate comparisons among test-takers” (p. 42). It was interesting to note that Popham reported standardized achievement tests as not suitable for determining the instructional effectiveness of teachers. According to Wood (1999), the tests identified what children did not know and that educators could address those areas more efficiently and effectively by essentially teaching to the test.

In 1957, Americans were stunned when the Soviet Union successfully launched *Sputnik*, the first artificial satellite. *Sputnik* created a huge blow to American pride and many proclaimed the United States as losing the race for space. According to Roberts (1989), the launch of *Sputnik* created an urgent awareness of the need for school reform in American public schools, which focused on the academic areas of science and math (Moriarty, 2002). President Dwight Eisenhower pushed the National Defense Education Act (NDEA) through Congress in 1958, providing substantial federal funding for strengthening instruction in mathematics, sciences, and foreign languages (Owens, 2004). Over a 4-year period, the NDEA authorized \$887 million to fund scholarships, student loans, research, and equipment (Brucoli & Layman, 1994). Graham (2005) reported that the act opened with the observation, “The Congress finds that an educational emergency

exists and requires action by the federal government” (p. 15). According to Armstrong (2006), the United States’ response to *Sputnik* elevated math and science instruction to join reading as the most valued and highly funded subject in the country’s schools.

The landmark United States Supreme Court decision of *Brown v. Board of Education of Topeka* in 1954 addressed the segregation of white and African American children in the public school setting (Manning & Lucking, 1990). The Supreme Court ruled that Brown’s 14th Amendment rights had been violated. This case awarded African American children equal protection under the laws guaranteed by the 14th Amendment (Warren, 2003). This law replaced *Plessy v. Ferguson* of 1896 when the court ruled that *separate but equal* facilities were constitutional. *Brown v. Board of Education* ruled that separate but equal was, in fact, unconstitutional and school systems were required to take action to desegregate. This case also caused more focus to be placed on standardized testing to sort students educationally, according to their performance on one test. Based on standardized test scores, the *Brown v. Board* case challenged whether separate could ever be equal (Manning & Lucking). American schools began using standardized tests to track students through their education and, supposedly, to help them be productive members of society. In the late 1960s, schools began to hold students accountable for their own achievement (Saylor, 1981).

In 1965, President Lyndon Johnson signed the Elementary Secondary Education Act (ESEA), making it a priority to address the needs of students of poverty (U.S. Department of Education, 2004). Title I was created as part of President Johnson’s “War on Poverty” plan. Passed in 1965, Title I was an important educational component of the Elementary and Secondary Education Act and the nation’s largest federal assistance

program. It supported programs in high-poverty schools and was intended to improve academic achievement in reading and mathematics for economically disadvantaged students. Approximately one billion dollars was allocated to high poverty schools in the 1st year and more than \$200 billion in federal dollars was spent since the passage of the Elementary and Secondary Education Act, now reauthorized as No Child Left Behind (U.S. Department of Education). Title I continued to allocate funds to 12,000 school districts in an attempt to improve academic achievement in mathematics and reading for disadvantaged students in collaboration with the requirements of the No Child Left Behind Act. Schools with at least 40% of their population receiving free or reduced-cost meals program qualify for Title I funding from the federal government. However, school wide Title I programs impact the entire student population not just the economically disadvantaged. In order to meet the state's standards, targeted assistance Title I schools identified at-risk students and used funds to provide individualized programs to assist those students in increasing academic achievement. In addition, each district receiving Title I funds must spend at least 5% of the Title I allocation on professional development to help teachers become highly qualified (U.S. Department of Education).

Standardized Testing in Education

A standardized test involves the use of standards in order to determine the criteria to make judgment on the quality of student performance (Gunzenhauser, 2003). The quality of student performance determines consequences, ranging from grade retention for students and punitive measures or rewards for schools or systems (Marchant, 2004). Horn (2003) reported that standardized testing gained its hold on the educational

community almost 30 years ago with the minimum competency period of the 1970s and 1980s. In April 1983, The National Commission on Excellence in Education presented *A Nation at Risk: The Imperative for Educational Reform* report to the Secretary of Education, the United States Department of Education, and the nation. This report stated that minimum competency was not enough for American students; rather, they needed to be held to rigorous and measurable standards (Horn).

Normally, standardized tests are standardized achievement tests for the state or the nation. As noted by Marchant (2004), a test is considered standardized if it has a set of rules for administration; for example, if everyone taking the test received the same directions and abided by the same restrictions of time and resources regardless of their diverse needs and learning styles. Tests are normally designated for a specific grade level and subject area and two of the more widely used achievement tests are the *Terra Nova* and the *Standard-9* (Marchant).

According to Johnson and Johnson (2006), curricula taught in schools drastically changed because of standardized testing. Teaching to the test became part of the curriculum taught in schools across the nation because of accountability and standardized testing. According to Wood (1999), when standardized tests became an end unto themselves, the value of investigation, creativity, and positive social interaction was diminished and would be ultimately lost. Some educators neglected to recognize differences in students because of the pressure to meet local, state, and national standards (Tomlinson, 2000). Instructional time for students in grades kindergarten through eighth is losing out to time spent teaching test-taking skills. Bracey (2000) reported that teachers were abandoning their usual curriculum and styles of teaching to lecture about

test-oriented material, and in many cases teachers were omitting aspects of the curriculum not on the test.

Originally, standardized testing or a standardized achievement test was used to provide solid information for diagnostic and prescriptive teaching methods in relation to individual student achievement and ability (Marchant, 2004). Teachers are still using these tests, along with other assessments, to plan instruction, calculate grades, and place students in particular programs; however, policymakers are now holding schools and systems accountable for the performance or progress of students. The stakes of standardized testing come into play when test scores are used to assign students to schools, programs, classes (tracking), promotions, or even diplomas and for schools when test scores are used to make decisions on whether a district or state should intervene or take over the administration of a school (Goertz & Duffy, 2003).

The Tennessee Comprehensive Assessment Program (TCAP)

In the state of Tennessee each spring, elementary school students in grades 3-8 take the mandated Tennessee Comprehensive Assessment Program (TCAP) achievement test. The test is not mandated for grades K-2; however, school systems can elect to test students in Kindergarten, 1st, and 2nd grades (Tennessee Department of Education, 2007a).

The TCAP Achievement test uses multiple choice questions that provide a measure of knowledge and application skills in various subject areas. The test for kindergarten includes reading, language arts, and mathematics. The test for first grade includes reading, language arts, mathematics, science, social studies, word analysis,

vocabulary, and math computation. The test for second grade includes reading, language arts, mathematics, science, social studies, word analysis, vocabulary, language mechanics, math computation, and spelling. The TCAP Achievement Test for the 6th grades is a timed, multiple choice assessment that measures skills in reading, language arts, mathematics, science, and social studies. The tests are broken into segments for students to take over several days. There are English language learner accommodations, allowable accommodations, and special accommodations available (Tennessee Department of Education, 2007a).

The TCAP is a criterion-referenced test in which a student's performance is measured against specific standards or criteria rather than against the performance of other test takers. The curriculum standards as defined by the state of Tennessee provide objectives for student accomplishment. From these objectives, performance indicators are written to describe how the objectives would be measured. On the TCAP Achievement Test, each test item is directly linked to performance indicators, which are clustered into reporting categories for the reports given to students, parents, and teachers (Tennessee Department of Education, 2007c).

The TCAP test answers are machine scored and the results are designed to provide information regarding students' academic progress in Tennessee. The results are provided to teachers and school administrators to help them address the instructional needs of Tennessee students and the test data comprised one measure of student achievement during the school year. The kindergarten through second grade reports provide information to compare the achievement of Tennessee students with the performance of students from across the nation. The 6th grade report provide

information concerning performance on specific criterion-referenced objectives and a description of student performance on academic skills based on the grade span standards (Tennessee Department of Education, 2007a).

Results from the test provided information on how well students performed on the content being tested. The 6th grade student report listed the students' score and overall proficiency in each content area (advanced, proficient, or needed improvement). Each Reporting Category in 2007 had its own proficiency range. To have scored proficient on the TCAP test, students demonstrated general understanding of the essential concepts and skills of the content area on the TCAP assessment test (Tennessee Department of Education, 2007c). Students' results are then reported to parents, teachers, and administrators (Tennessee Department of Education, 2007a).

Accountability

According to Johnson and Johnson (2006), the No Child Left Behind Act brought about changes that stemmed from the fear that schools were not producing students who possessed sufficient knowledge. Another challenge was to produce the type of scientifically educated citizens that America needed for leadership in the economic global community and for the security of the country. The No Child Left Behind Act required schools to close the gap in achievement between 12 identified subgroups of students, to demonstrate steady gains in achievement for all students, and to provide a highly-qualified teacher for all students (U. S. Department of Education, 2004).

Student achievement is demonstrated through annual assessment and accountability measures as detailed by No Child Left Behind's adequate yearly progress

(AYP) objective (U. S. Department of Education, 2004). Each district and school must make AYP for all students collectively and with each identifiable subgroup of students as defined by the U.S. Department of Education (U. S. Department of Education). The 12 identified subgroups included: low-income students, Whites, Blacks, Native Americans, Hispanics, Asians, multiethnic students, special education students, English language learners, migrants, all students, and all students except special education students (Orlich, 2004).

Each state is allowed to design test batteries and to set proficiency levels for adequate yearly progress with 100% proficiency required by 2014 (Orlich, 2004). As noted by Finn and Hess (2004), public schools are to test their students yearly in grades 3 through 8 in reading and math and show steady improvement in each grade and in each subgroup. The No Child Left Behind Act required judgment for each subgroup with a minimum number of students determined by the states. If a school fails to make adequate yearly progress in any subgroup, it was considered *in need of improvement* and interventions would be implemented. If a school fails to make adequate yearly progress for 2 years in a row, students could move to another school in the system at the system's expense. If a school failed to meet the standard for 3 years, the system must provide supplemental educational services such as tutoring from the school or private firms. After 4 years, the school must write a school improvement plan and after the 5th year, the school would be reconstituted. No Child Left Behind established new standards of accountability and achievement for individual students, schools, and school systems. Educators continue to search for best practices and programs that would help them in creating an environment where students could be successful academically because of the

emphasis on accountability and achievement for schools created by No Child Left Behind (Tennessee Department of Education, 2008a).

Grade Configuration

The belief of many policymakers and educators that grade configuration did not matter educationally was uncontested until research questioned these ideas (Gregg, 2002). Mizell (2004) noted that many school systems followed national movements. Support or criticism of a particular school configuration or size was based on experiences. According to Gregg, research demonstrated that decreasing grade spans, increasing the number of students per grade and multiplying students' transitions from school to school negatively impacted student achievement.

Educators are searching for best practices that will help them create an environment where students could be academically successful in the classroom. Many different factors can contribute to the learning environment. These factors include the quality of teachers, administrators, and teaching materials, the physical quality of the building, and grade configurations. One area of interest is how best to configure the grades in local schools to create an environment where students can succeed academically. Many educators have searched for data confirming the best way to provide a high-quality education for children and to make the best use of their educational funds. Meeting student needs is the ultimate goal. However, meeting students' needs had the potential to be a very difficult task and might call for grade configurations to vary from school to school within a school system (Hooper, 2002).

The variations in grade span in schools could come by choice or as a result of practical and administrative considerations such as building costs, enrollment trends, racial diversity, socioeconomic status, and distance from other schools (Simonson, 2003). Stevenson (2006) stated that school districts instituted modern grade configurations for a variety of reasons. For example, some school systems had K-5, 6-8, and 9-12 configurations because of the available school facilities. School systems continued with the same grade-span configuration for athletic purposes or a belief that 6th graders were too mature to be with fifth graders. Today, the most common grade-span configurations are K-5, K-6, K-8, 6-8 or 7-9, and 9-12 (Howley, 2002).

The most common grade configuration in the 19th century was the 8-year primary school followed by the 4-year high school (Goldin, 1999). During this time, the majority of schools in the United States were held in a one-room schoolhouse that served a small rural community with only one teacher. The school might have had an enrollment of about 30 children in the elementary grades (Howley, 2002). Around the turn of the century, the National Education Association (NEA) and other educational committees began to advocate the restructuring of America's schools to meet the needs of early adolescent students (Manning, 2000a). In 1915, Teacher's College professor Ellwood Cubberly proposed that large schools in central locations could provide more resources and a better education. Administrators, for efficiency purposes, began the merging of one-room schools into larger schools. Educators were also told that students could be better served at centralized locations. As a result, the small single-teacher school was replaced and the K-8 or 1-8 configuration became a popular plan (Howley).

Yecke (2005) wrote that educators began questioning ways in which to address the differing academic abilities of students. The 8-year elementary and the 4-year high school configuration provided the basic skills and vocational training to a large number of students but only prepared a few to attend college (Goldin, 1999). According to Manning (2000a), this configuration of grades did not address the needs of young adolescents.

Mizell (2004) noted that around the end of the 19th century there was a movement to begin secondary education in the seventh grade rather than the ninth grade. Bedard and Do (2006) wrote that the idea behind junior high schools was to prepare young adolescents for high school without having the trauma of being placed in the same building with the older students. The first 3-year junior high schools, incorporating grades 7-9, were opened in Columbus, Ohio in 1909 (Manning, 2000a). Between the years of 1912 and 1938, the number of junior high schools increased dramatically (Mizell). Alexander (1988) wrote that national committees such as the Committee on Economy of Time were influential in laying the foundation for the junior high school movement. According to Alexander, committee members purported that junior high schools would accomplish the following goals:

1. Bridge the gap between the student-centered elementary school and the more academic-centered high school.
2. Serve the unique needs of young adolescents.
3. Provide a broader program with some options for students.
4. Solve various facilities, enrollment, and other administrative problems.
(p. 107)

During the 1950s and 1960s, many educators debated whether junior high schools were meeting the needs of young adolescents. According to Mizell (2004), the reasons for the critique of the junior high was that researchers found that students were reaching puberty earlier than they were at the beginning of the 20th century and this contributed to the view that the elementary school setting was no longer appropriate for young adolescents. Another factor for the change was the decline in secondary school enrollments and the increase in elementary school enrollments. Bradley and Manzo (2000) reported that junior high schools replicated the academic focus and shorter class periods of high schools; therefore, junior high schools failed to reach the needs of the students. Yecke (2005) stated that the concerns with the junior high configuration helped start the middle school movement.

Educators began studying the concept of the middle school, which emerged in the 1960s (Johnson, 2002). Researchers identified several reasons for the introduction of middle schools and the middle school movement (Alexander, 1984; Bedard & Do, 2006; DeYoung, Howley, & Theobald, 1995; Toepfer, Lounsbury, Arth, & Johnson, 1986).

According to Alexander (1984), there are two reasons for establishing middle schools: (1) earlier maturation of girls and boys during the middle school years and the heightened concern for establishing programs with the needs of adolescents and (2) problems with buildings, enrollments, and other matters. Toepfer et al. (1986) noted that factors such as economics in the local district and school population play a role in decisions about the middle-level school configuration. DeYoung et al. (1995) stated the probable cause behind the middle school movement is the demographic changes and redistricting pressures with desegregation. They concluded that, “middle schools in both

urban and rural places are attractive mostly for administrative, not pedagogical, reasons” (p.25).

Bedard and Do (2006) noted that middle school advocates argued that 6th grade students would benefit from being separated from elementary students. Middle school supporters believed that young adolescents possessed distinct social, psychological, and academic needs from those of both younger and older students. Middle school educators believed that young adolescents’ academic achievement and progress was slowed if the students were placed with elementary or high school children. The result of the concerns was the creation of the middle school.

In 1950, the Bay City, Michigan school system created the first middle school (Manning, 2000a). By the 1960s, the nation began accepting the notion that 12- and 13-year-old students had particular needs that could be met best when students were housed in a separate building (Cromwell, 1999). In 1971, there were 1,662 middle schools and the number grew by over 400% to 6,709 by 2000 (Lucas & Valentine, 1996). In 1997, of approximately 82,000 public schools in the United States, only 1,100 were K-12 schools (Howley, 2002). Paglin and Fager (1997) found that in the United States seventh and eighth graders attended schools with about 30 different grade spans.

Cromwell (1999) reported that the educational pendulum could not swing much farther in the direction of middle schools. In a span of 4 years (1987-1991), middle schools rose by 20% in rural areas while K-8 schools declined by 24% (Howley, 2002). However, there were some educators that advocated reinstating or creating new K-8 schools (Cromwell).

The executive summary by the Portland Public School System (2006) described school configuration for elementary grade students as an evolution that responded to societal changes and educational research that included four waves of change:

1. Wave One: Primary K-8 schools in the early 1900s that enabled students to enter the workforce after 8th grade.
2. Wave Two: Junior High Schools served grades seven to nine in the mid 1900's and prepared students for content focus of high school.
3. Wave Three: Middle Schools, in the late 1900s, served 6th to eighth grade and were built to be more “develop-mentally” appropriate.
4. Wave Four: The present day “elemiddle” school with grades K-8 that addresses widespread failure of middle school model. (Portland Public, 2006, p. 3)

Middle Schools versus K-8 Schools

Hopkins (1997) stated that several factors must be taken into consideration when deciding which grade configuration best met the needs of a school system and community. Considerations included the number of students, transportation costs, effects on other schools, number of transitions for affected students, school building layout and design, socioeconomic status of the student population, schools system goals for student achievement, and effects on parent involvement.

George (2005) studied the positive versus negative outcomes for the K-8 reconfiguration. Positive outcomes included the closure of *troubled* middle schools, increased test scores, improved student discipline, relief of overcrowding in large middle schools, elimination of a transition, more positive student-teacher relationships, increased parent involvement and communication, collaboration between elementary and secondary

educators, and a positive influence on teacher education and administrator preparation. George's negative arguments included conflict between traditional paradigms of elementary and secondary education at every level, little evidence on test scores being improved by grade level change, slighted professional development for school leaders and teachers, problems with teacher preparation and orientation, a more difficult transition to high school from a K-8 setting, corruption of younger students, scheduling issues, unprepared administrators, and expensive staff additions.

A 2003 national study of over 100 K-8 school administrators found that 84% of K-8 respondents noted the ideal grade arrangement for middle grade students was a separately organized middle school (McEwin, Dickinson, & Jacobson, 2004).

Other findings in this survey were that:

1. K-8 schools reported scheduling an average of about one-half hour more instructional time per day for core subjects than did middle schools.
2. Middle schools offered a greater variety of elective courses than did K-8 schools.
3. Only 33% of K-8 schools, as compared with 77% of middle schools, reported interdisciplinary teaming in the core subjects.
4. Only 4% of K-8 teachers had a common planning time as compared to 41% of middle school teachers.
5. Over 48% of middle schools and only 29% of K-8 schools reported having advisory programs. (pp. 26-27)

Stevenson (2002) suggested that there was substantial research indicating that each school transition experienced by a student had a negative effect on learning. The concept of finding new models to ease early adolescents through the transition years became common philosophy among educators (Reeves, 2005). Reeves also noted that

schools in Rochester were phasing out the district's middle schools to reduce the number of transitions. The idea of limiting transitions was what helped the K-8 school stage a comeback (Stevenson, 2002). Patton (2005) wrote that the K-8 school structure was one of the hottest educational trends because a responsive learning environment was a boost for academic achievement. Stevenson (2006) noted that the factor of configuration and corresponding transitions played a part in not only how much students learned but also in how much they retained.

Alspaugh (1999) concluded that Missouri students in the K-8 grade configuration who transitioned to high school without attending an intermediate middle school experienced less achievement loss than students who attended a middle school or junior high school. Alspaugh also found that students who transitioned from multiple elementary schools and merged into one middle school experienced greater achievement loss compared to those students who transitioned from a single elementary school into one middle school. Alspaugh noted that students had a significant achievement loss during each transition year and found that some students regained what was lost during the following year. However, he added that it would seem that students who made fewer transitions needed fewer years to make up for achievement losses caused by transitions. However, Rysewyk (2008) reported no significant relationship between the number of transitions and 9th grade students' academic performance.

Grade configuration and achievement were examined in studies in Connecticut and Maine. In Connecticut, 6th grade achievement was studied with findings that grade six that configured with lower grades (K-6 or K-8) scored higher academically versus those that placed grade six with the secondary school levels (Howley, 2002). In a study

in Maine, researchers looked at eighth graders and their achievement in different grade configurations. Researchers found student achievement was higher when students were included with the elementary grades (K-8, 3-8, K-9, and others) rather than as part of junior and senior high schools or within the various middle-grade configurations.

The Milwaukee Public Schools examined student scores and found that middle school students who attended K-8 schools performed better than their peers in traditional middle schools in language arts, mathematics, reading, social studies, and science (Wallis, 2005). As a result of this study, since 2001 the number of Milwaukee's K-8 schools expanded from 12 to 52 and the number of Milwaukee's middle schools declined from 23 to 14.

Schouten (2002) found that, in Philadelphia, reading and math scores were higher for fifth graders in the K-8 school as opposed to those in the middle school. K-8 students also showed higher gains in reading and math than the students in the middle school setting. In another study that compared the effectiveness of Philadelphia's K-8 schools as compared to middle grades schools, Offenber (2001) found that scores on standardized tests such as the eighth-grade SAT-9 were significantly better in K-8 schools than in middle schools. In 2002, the Philadelphia Education Fund in conjunction with John Hopkins University and the University of Pennsylvania studied 3,000 Philadelphia students. This study found that students in K-8 schools scored 50 points higher on state tests than students attending middle schools. The study also found that students in high poverty areas performed better in K-8 schools than in middle schools. In a different study, Offenber noted that Philadelphia's K-8 schools served fewer students for twice as many years in smaller settings. These two differences in the K-8 schools and the middle

schools allowed better opportunities to develop better relationships among teachers, students, and parents. According to Patton (2005), improved test scores and results from various studies were the reason the district planned to create a total of 133 K-8 schools by 2008. Philadelphia had a 5-year plan to transform most of the city's 42 middle schools into K-8 schools (Schouten).

In Pittsburg, there were mixed reviews concerning the shift to K-8 schools (Schaarsmith, 2005). Schaarsmith stated that supporters of the middle schools said that middle schools offered more advantages such as electives and advisers. On the other hand, advocates of K-8 schools noted that K-8 schools gave children 10 to 14 years old a familiar, stable setting at a time when many other things in their lives were changing drastically. According to Schaarsmith, the test results in Pittsburg Public Schools were mixed. In one K-8 school, a group of eighth graders outperformed those in the rest of the district's eighth grade including those in the highest scoring magnet middle schools. In contrast to the high performance of that one K-8 school, other eighth grade groups in K-8 schools had some of the district's lowest math and reading scores. Despite the range of results, the district continued moving toward K-8 schools.

One of the more recent school systems to look at reconfiguring its schools was Portland, Oregon Public Schools (Portland Public, 2006). Their system's study noted similar studies from across the country and included information that the middle school scores on their state exam had dropped. The school system reported that the K-8 configuration held promise for Portland's schools.

George (2005) noted that the K-8 configuration could lead to increased test scores, improve student discipline, and relieve overcrowding. However, a survey of K-8

school administrators indicated that the majority considered middle schools to be a more effective configuration (McEwin et al., 2004). On the other hand, DeJong and Joyce (2002) found that the prime reasons for implementation of the K-8 arrangement were to promote greater articulation of curriculum for grades K-8 and to cause fewer transitions for students.

The Middle School Configuration

Middle schools were designed to build on the junior high school core curriculum, guidance programs, exploratory education, and vocational and home arts (Manning, 2000a). Although, sometimes, the terms middle school and junior high are used interchangeably, there was a significant difference between the two. Middle schools are based on a team teaching model and junior high schools are organized on a departmental model (Dejong & Craig, 2002).

The National Middle School Association (NMSA, 1996) found that exemplary middle schools centered on the intellectual, social, emotional, moral, and physical developmental needs of young adolescents. Manning (2000a) and Perry (2005) described adolescence as a time of tremendous change and great social, emotional, physical, and intellectual disparity. The structural design of a middle school cannot support the students' needs. However, student development can be supported by fostering from the faculty and community working with middle school students. Middle level education was set up to be about the development of adolescents and the middle level students (Perry).

The National Middle School Association report (1996) described middle school students as undergoing rapid physical growth, changes in moral reasoning, the onset of abstract thinking, and the introduction to a range of social pressures including drugs, sex, and violence. At the same time, young adolescents are challenged with the lifelong developmental tasks of forming a personal identity or self-concept, acquiring social skills, gaining autonomy, and developing character and a set of values. The National Middle School Association (1992) conceptualized successful middle level schools that promoted the healthy growth of young adolescents as lifelong learners, ethical and democratic citizens, and increasingly competent, self-sufficient young people who were optimistic about the future. According to the NMSA (1996), exemplary middle schools promoted proper programs, policies and practices that fostered the development of these tasks.

Manning (2000b) noted that middle schools needed to define guidelines for best practices. Examples of these best practices included exploratory programs, interdisciplinary teaming, qualified middle school teachers, educational experiences based on young adolescents' needs, comprehensive guidance and counseling programs, flexible scheduling, and parent involvement. Middle schools should provide young adolescents with opportunities to participate in service-learning and to learn values, citizenship, and social skills.

This We Believe, published in 1992 by the National Middle School Association, gave professional guidelines for middle level education (NMSA, 1992). NMSA research found that the characteristics for a successful middle school when present over time led to higher levels of student achievement and overall development. The authors (NMSA)

wrote that middle level schools were characterized by a school culture that included: a) educators committed to young adolescents, b) a shared vision, c) high expectations, d) an adult advocate for every student, e) family and community partnerships, and f) a positive school climate (p.3). According to the NMSA, successful middle level schools should provide:

- (a) curriculum that is relevant, challenging, integrative, and exploratory,
- (b) diverse teaching and learning styles,
- (c) authentic assessment and evaluation,
- (d) flexible and supportive environment,
- (e) school-wide programs and policies that foster health, wellness, and safety,
- (f) all students with comprehensive guidance and support services. (p.3)

To be successful, the middle school's organization, curriculum, pedagogy, and programs must be based on the developmental readiness, needs, and interests of young adolescents. This concept is at the heart of middle level education. According to the National Middle School Association (1992), effective middle school curricula should be exploratory, integrative, and challenging.

Erb (2000) argues that some of the research on middle school is contradictory because, at times, the design of the study is poor, focusing on schools just beginning to change or on schools that had not really changed but called themselves middle schools. In 1989, in *Turning Points: Preparing American Youth for the 21st Century*, the Task Force on Education of Young Adolescents from the Carnegie Corporation stated that the

eight interdependent main components of middle schools, as follows, must all be implemented:

1. empowering teachers and administrators,
2. involving families,
3. connecting schools with community,
4. improving academic performance through health and fitness,
5. teaching a core academic program,
6. staffing school with teachers trained in needs of young adolescents,
7. creating small learning communities,
8. ensuring success for all students. (pp. 26-27)

Many factors contribute to a positive learning environment. Research suggested that curriculum coordination, common planning time, and positive teacher-student relationships increased academic achievement (Erb, 2000). The learning environment of a middle school was different from that of an elementary school in several ways. Sixth graders in an elementary school were usually assigned to a teacher's classroom and stayed with the same group of students during the entire school day. A sixth grader in a middle school typically would be assigned to a team of teachers and switch classrooms throughout the day. Middle schools placed a greater emphasis on academic achievement and discipline with less opportunity to create close relationships to teachers (Cook et al., 2007).

Nussbaum (2004) describes some New Jersey educators views of middle level education as a unique time of life, while other educators expressed that putting such a

volatile age group together in the same building was simply a recipe for problems. Ecker (2002) states that middle school is a time of transition for the students and the focus should be on their changing needs in order to create an effective learning environment. Administrators and teachers must take into consideration that the young adolescents were changing physically, emotionally, and intellectually. These changes required flexible learning styles that maintained stability between structure and choice. Ecker stressed the importance of student accountability, communication, and parental involvement in the middle school setting. In addition, Manning (2000b) reported that it was important for middle school teachers, administrators, counselors, and parents to work collaboratively to meet the needs of the students. However, Manning added that middle school educators would succeed only with the support of the administrators both at the school and district level.

Misrepresentation of the Original Middle School Model

Are there problems with the middle school configuration? Advocates of middle schools state that there is nothing wrong with the middle school (Dickinson & Butler, 2001). On the other hand, Bradley and Manzo (2000) summed up the state of middle schools by describing them as the weak link of education. Wallis (2005) calls middle schools “the Bermuda Triangle of education” (p. 5) where students have lost their way academically and socially. Tucker and Coddling (1998) wrote that middle schools were the “wasteland of U.S. education” (p. 8) because middle schools were caught between the nurturing of an excellent elementary school and the academic importance of high schools.

Further, the students in the middle schools often got the least of both and the best of neither that the elementary and high schools offered.

Fischer (2003) stated that many communities questioned the value of middle schools that never fully implemented the elements of a true middle school. Fischer listed the fundamentals essential for full implementation of a true middle school based on the National Middle School Association as follows: interdisciplinary teaming involving a core of teachers assigned to the same students, advisory programs, varied instructional methods, exploratory programs, and a transition program for incoming sixth graders. However, Brown, Roney, and Anfara (2003) found that while the components of the middle school concepts such as teaming provided tools to help teachers in urban schools overcome the effects of low socioeconomic status on student achievement, they were not strong enough by themselves. Teacher affiliation, strong academic focus, and resource support more directly influenced academic achievement. According to Erb (2006), leadership is critical in making middle schools work. Both teachers and administrators must be lifelong learners who are held accountable for their performance and trusted to act on their professional judgment.

Mizell (2000) found there were serious questions about middle school student achievement levels and the capacities of middle schools to challenge those students academically. Educators often questioned why students that had consistently improved during their elementary years began to experience significant achievement declines in middle school. Mizell (1999) along with Dickinson and Butler (2001) identified six problem areas for middle schools. The first problem area was the incremental stage implementation model used by educators to implement the middle school concept. In the

early 1960s, junior high schools began to transition to middle schools without appropriate preparation for teachers and administrators. The second concern was the lack of teacher education programs and licensure that focused on the middle school level. Dickinson and Butler wrote that the sad truth remained that the majority of teachers throughout the history of the middle school movement were not educated to teach at the middle school level. The third problem area was the lack of attention to curriculum. According to Dickinson and Butler, in middle school after middle school the curriculum that existed prior to transition remained untouched. This situation meant that the middle school concept existed as a shell in even the best middle schools. The fourth problem was the failure of the National Middle School Association fully to recognize leadership for the middle level. Dickinson and Butler noted that instead of the NMSA leading the middle school movement the association was described as following behind the movement. The fifth concern was the absence of research to sustain the middle school concept. Dickinson and Butler wrote because of the lack of research, much of the middle school movement and the implementation of the middle school concept were built on faith. Finally, the last concern was the overall misunderstanding of the original middle school concept led to the breakdown of the middle school.

In the report, *Mayhem in the Middle*, Yecke (2005) summarized the evidence the middle grades were where student achievement in the United States began its plunge, as follows:

1. In 1995, American fourth graders scored at the international average on the Third International Mathematics and Science Study (TIMSS) assessment of math. Four years later, the same students were 22 points below the international average. In science, U.S. fourth graders scored 28 points above the international average in 1995, but in 1999 their eighth grade scores had dropped to nine points below average, a 37-point decline.

2. The 2003 Program of International Student Assessment (PISA) found that U.S. 15-year-olds ranked 24th out of the 29 countries in both math literacy and problem solving.
3. Although 13-year-olds' math scores on the National Assessment of Educational Progress (NAEP) have risen slightly since 1990, their reading scores in 2004 remained flat—at the same inadequate level that caused the U.S. to be declared a “nation at risk” in 1983. (p. 65)

The Rand Corporation released *Focus on the Wonder Years: Challenges Facing the American Middle School*, the most comprehensive report, a review of 20 years of educational research (Wallis, 2005). This report offered a harsh critique of the middle school record. Wallis noted this research that found:

1. More than half of eighth-graders fail to achieve expected levels of proficiency in reading, math and science on national tests.
2. In international ratings of math achievement, U.S. students rank about average, ninth out of seventeen, at Grade 4, but sink to twelfth place by Grade 8, setting the stage for further decrease in high school.
3. Reported levels of emotional and physical problems are higher among U.S. middle school students than among their peers in all eleven other countries surveyed by the World Health Organization. The same health behavior survey found that U.S. middle school students have the most negative views of the climate of their schools and peer culture.
4. Crime takes off in middle school. Statistics from 1996-97 show that while 45% of public elementary schools reported one or more incidents to the police, the figure jumps to 74% for middle schools--almost as high as high schools 77%. (p. 2)

Reeves (2005) reported that many districts reconfigured their schools because of enrollment gains and space constraints. However, other districts chose to reconfigure schools based solely on academic performance. No single explanation was likely to resolve all the questions concerning middle school student achievement (Southern

Regional Educational Board, 1998). Dickinson and Butler (2001) described a process of reinvention that must take place for middle schools to be effective in educating young adolescents. They wrote that schools must acknowledge where they were and examine their attitudes and practices. Schools must also begin to rework and refocus on the original concept that was still valid because the middle school movement was founded on the appropriate schooling of young adolescents (Dickinson & Butler).

K-8 Schools

The K-8 configuration is making a comeback in urban, suburban, and rural school districts. Pardini (2002) wrote that more and more school districts were scrapping their middle schools in favor of a K-8 school configuration. In some urban districts, the K-8 model reemerged as a possible solution for their struggling middle schools (Portland Public, 2006). The movement was prompted by several factors including growing discontent with middle schools, the district's own research on the relationship between grade configuration and academic achievement, and the wishes of parents (Pardini, 2002).

The K-8 schools dominated the landscape of public education in America until the middle of the 20th century and were still the norm for private schools (Pardini, 2002). Mizell (2004) wrote that some educators found the K-8 grade configuration to be an attractive alternative because it appeared to accomplish the problems of the larger middle schools. First, it removed the students from the 6-8 schools that failed to apply the middle school concept. The second reason educators favored the K-8 model was because

it provided young adolescents with the personalization students were not getting in the large middle schools.

Dejong and Joyce (2002) stated that the major reasons for the implementation of the K-8 model were to foster greater articulation of curriculum from grades PK-8, to cause fewer transitions for students throughout their total education, and to have students remain in the neighborhood schools, thus reducing transportation and improving safety. In some cases, this was also a matter of demographics. With the number of school aged children per household at an all-time low, there were fewer neighborhood children. Often, there were not enough students for separate elementary and middle schools, but combining the grades in one facility worked. Coladarci and Hancock (2002) found similar results. The K-8 model lacked school-to-school transitions and the greater continuity of experience arguably might result in the higher achievement reported for middle-grade students attending the K-8 schools.

Hough (2003) wrote that it was easier to implement middle school concepts in K-8 schools because the climate for teaching both children and adolescents was already in place. A program that sustained a nurturing environment could help students make the transition from childhood to young adolescence. Addressing this transition without changing schools was a significant strength of the K-8 school. In a K-8 school, more opportunities existed to match developmentally appropriate instruction with a group of students across grade levels. Hough also noted that research indicated a significantly higher level of middle-level programs, policies, and practices in K-8 than in 6-8 schools.

Through extensive research on K-8 schools, Look (2002) compiled reasons why K-8 schools were a better option than larger middle schools:

1. K-8 schools can give at-risk students greater opportunities of success by building relationships with teachers.
2. A K-8 school can incorporate appropriate middle grades programs within a K-8 span.
3. Transitions in K-8 schools can enhance teacher collaboration within and across grades.
4. K-8 parental involvement is greater because parents remain connected to one school longer.
5. Middle grade students in a K-8 school behave differently than middle school students. Older students take on the part of protector, tutor, and role model instead of having to build a reputation when entering a middle school. (www.philafund.org)

Portland Public Schools noted there was strong evidence of increased academic achievement in high poverty K-8 schools (Portland Public, 2006). The Portland executive study noted that students in highly disadvantaged K-8 schools experienced up to twice the achievement gains in math and reading compared to students from the same background in disadvantaged middle schools. Portland also reported their study found students coming out of a K-8 setting were less likely to drop out of school before graduation.

In a study of 18 schools in the City School District of New York City, Moore (1984) found seventh and eighth grade reading achievement was higher for students in K-8 schools compared to middle school students. Students in nine K-8 schools and nine middle schools were compared on reading achievement, self-esteem, attitude toward school, student perceptions of teachers' discipline methods, and attendance. The K-8 and middle school students were similar in socioeconomic status and ethnicity. Moore determined there was a significant difference in mean scores of K-8 and middle school

students for each of the five variables. The students in the K-8 schools had significantly higher reading scores, more positive attitudes toward school, higher self-esteem, and better attendance than those in the middle schools.

Alspaugh (1998) conducted an ex post facto study to explore the achievement loss associated with the transition to middle school and the transition to high school. The study consisted of three groups of 16 school districts for a total sample of 48 districts. The study found a significant achievement loss associated with the transition to middle school in the 6th grade as compared to K-8 schools, which had no school-to-school transition at 6th grade. The students attending middle schools experienced a greater achievement loss in the transition to high school than did those in the K-8 elementary schools. High school dropout rates were higher for the students attending middle schools than those students attending the K-8 schools.

A research study in North Carolina middle school students examined the difference grade configuration was likely to make for students (Cook et al., 2007). The researchers found several differences between elementary and middle schools. The first difference was that middle schools provided the students more freedom. Next, the middle school configurations brought 6th grade students in contact with older adolescents. The older students were more likely to be a bad influence on the 6th grade students and this influence appeared to continue through the ninth grade. The last finding was that school systems that moved 6th grade students from elementary school to a middle school experienced a decline in high school graduation rates. The researchers concluded that placing 6th grade students in middle schools reduced academic achievement and increased behavior problems.

In another study, Paglin and Fager (1997) found that anonymity increased each time students switched schools. The researchers who found that 6th-grade students in both elementary and combination K-12 schools outperformed students in middle schools or junior high schools considered the number of transitions a significant factor. This study consisted of eight schools with seven different grade configurations.

Another study noted that girls in early adolescence experienced a drop in self-esteem, extracurricular participation and leadership behaviors when they made the transition into middle school or junior high, but those declines did not manifest if they remained in an elementary school setting (Simmons & Blyth, 1987). The study found similar negative effects in extracurricular participation and grades but not in self-esteem when boys made the transition into middle school or junior high. The researchers concluded that the smaller elementary school settings made adolescent changes less stressful for both boys and girls.

Franklin and Glascock (1996) also discovered fewer discipline problems when adolescents were grouped with elementary grades. The two researchers examined the effects of transitions on student behavior. Results indicated that 6th grade students experienced more suspensions in middle schools or junior high schools than in elementary schools and that 6th grade students performed better in elementary school configurations than in middle schools. This change in behavior and difference in academic achievement could be linked to the school organization, school size or the effects of the transition. Franklin and Glascock's study is supported by data collected from all Louisiana public schools during the 1992-1993 school year.

A group of researchers from the University of Massachusetts of Donahue Institute (2005) studied achievement scores in Massachusetts and interviewed administrators and teachers to discuss the advantages and disadvantages of K-8 configurations. Among the findings were five advantages:

1. K-8 engenders a shared responsibility for learning across all grade levels because teachers are connected to students for a longer period of time.
2. Communication among staff was better across grade levels in a K-8 configuration.
3. There was collaboration and a continuity of instruction from grade K to 8.
4. K-8 eliminated certain aspects of a student's transition from elementary into middle school.
5. Students, staff and parents maintained a connection over a longer period of time, K-8 schools are more supportive of building community, created stability, and made the school feel like a family (UMASS Donahue, 2005, p. 15).

Potential weaknesses of the K-8 configuration included:

1. Meeting the needs of students at widely different developmental and educational levels.
2. Small size limited peer group size and the options for courses and teachers as compared to larger, traditional middle schools.
3. Students in a K-8 schools may have difficulty making the transition to high school.
4. Parental involvement was strong during elementary years, but it often wanes during the middle school years even with the K-8 model (UMASS Donahue, 2005, p. 15).

Academic Achievement in 6-8 Schools versus K-8 Schools

Bradley and Manzo (2000) stated that both proponents of the middle school model and critics of the approach recognized that too many schools had failed to find their academic way. They noted the original middle school concept failed because of ill-prepared teachers guided by ill-defined curricula. Data from The National Education Progress indicated troublesome trends with middle school students (Heller, Calderon, & Medrich, 2003), including instability in middle school student achievement in the area of math and reading. Heller et al. also questioned whether or not the middle grades were responsible for this trend.

Considerable research marked a decline in motivation and academic achievement for many children as they moved from elementary school into middle school (Anderman & Midgley, 1999). Anderman and Midgley wrote that many attributed the decline to physiological and psychological changes associated with puberty and, therefore, it was somewhat inevitable. However, this assumption was challenged by research that posited the nature of motivational change on entry to middle school depended on characteristics of the learning environment.

Cooney and Bottom (2003) referred to the 10-step comprehensive school-improvement framework designed by the Southern Regional Educational Board and used to increase student achievement:

1. an academic core that is aligned to what students must know, accelerates their learning, challenges them and appeals to their interests,
2. a belief that all students matter,
3. high expectations and a system of extra help and time,
4. classroom practices that engage students in their learning,

5. teachers working together,
6. support from parents,
7. qualified teachers,
8. use of data,
9. use of technology for learning, and
10. strong leadership. (p. 21)

Alspaugh and Harting (1995) conducted an ex post facto study to analyze the transition effects of school configuration on student achievement in Missouri. In the study, grade level was the independent variable and student achievement in reading, mathematics, science, and social studies as measured by the Missouri Mastery and Achievement tests were the dependent variables. The researchers concluded that there was a consistent decline in student achievement associated with the transition from self-contained elementary schools to intermediate-level schools. Achievement loss in social studies, mathematics, science, and reading occurred when the transition was at grade 5, 6, 7, or 8. Wren (2004) found school-to-school transition had a profound effect on student achievement. The passing rate data from 232 schools in a large urban inner city area were analyzed and Wren found that the longer a student stayed in the same school, the better the academic achievement.

Howley (2002) noted a study in Maine that examined the academic performance of 6th grade students. The researcher concluded that student achievement was higher when the 6th grade students were included with the lower grades rather than as part of the various middle-grades configuration. Similarly, in a Maine study the researcher asserted

that eighth grade student achievement was higher when the eighth grade was included with elementary grades.

Summary

In Chapter 2, a review of literature examined the history of education in Tennessee, standardized testing, standardized testing in Tennessee, testing and accountability, school configurations, middle schools, and K-8 schools. No Child Left Behind established new standards of accountability and achievement for individual students, schools, and school systems. As a result of the No Child Left Behind law, standardized testing has become one of the primary means of measuring student achievement in the United States. Because of the emphasis on accountability and achievement for schools, educators search for best practices that would aid in creating an environment where students could succeed academically. The research showed that change in grade configuration, 6-8 to K-8, has become commonplace throughout the United States as school districts seek any practice or change that might increase academic achievement and avoid governmental intervention. Chapter 3 presents the methodology and procedures used in the study, data collection, and analysis.

CHAPTER 3

METHODOLOGY

Introduction

The purpose of this study was to determine if academic achievement as indicated by the Tennessee Comprehensive Assessment Program (TCAP) Achievement Test was different for 6th grade students enrolled in 6-8 schools and those enrolled in K-8 schools in the state of Tennessee. The study also addressed the relationship between school configuration and meeting Adequate Yearly Progress. The data were gathered from an analysis of mean standardized test scores in math, reading-language arts, science, and social studies for 6th-grade students in 137 school systems comprised of 342 schools located in the state of Tennessee.

Chapter 3 describes the methodology and procedures that were used in this study. The chapter is organized into the following sections: research design, population, instrumentation, procedures, data analysis, and summary.

Research Design

This research was a quantitative, comparative study of secondary data that examined the differences in academic achievement in 6th grade students based on their attendance in either a K-8 grade configuration or 6-8 grade configuration. This study was organized around five research questions. Methodology included selection of the population, TCAP data, treatment of the data, educational significance, quantitative data, and an explanation of how the data sources were used to answer the questions.

Population

The population included all 6-8 schools and all K-8 schools that housed 6th grade students in Tennessee in the 2006-2007 school year. The population included 137 school systems comprised of a total of 342 schools located throughout the state of Tennessee from rural, urban, and suburban areas. This study focused on school aggregate data for 6th-grade students and their performance on the TCAP test in the content areas of mathematics, reading, science, and social studies. School information was obtained from the Tennessee State Department of Education (2008) website. Data were gathered from 171 K-8 schools and 171 6-8 schools (Tennessee Department of Education, 2007b).

Procedures

Approval to conduct the study was obtained from the Institutional Review Board (IRB) at East Tennessee State University. The Tennessee State Department of Education published an annual report card for each public school district and school, which was accessed from the state web page (Tennessee Department of Education, 2007b).

After approval was granted, the 2006-2007 school report cards were printed from the Tennessee Department of Education website for each of the schools studied. The schools that met the criteria for the study were selected, categorized by their grade span configuration, and coded. The aggregated school test scores expressed as percent passing for 6th grade math, reading-language arts, science, and social studies scores and the NCLB information were obtained from the state report card. The information was entered into the SPSS statistical software program. The NCLB information (AYP) was

reported as categorical, dichotomous data. The statistics were analyzed to determine if the hypotheses should be rejected.

The data were obtained from the state report cards published each year by the Tennessee State Department of Education. Since 1992, with the passage of the state's Education Improvement Act, Tennessee has had an accountability system. The Tennessee State Department of Education publishes a report card for each public school district and school. The state modified its report card to meet the requirements of No Child Left Behind in 2002 but archived report cards were available online to 1995. The Tennessee State Department of Education's report card data is considered valid and reliable. The data were tested, used throughout the educational system, and thoroughly examined for errors. The report cards were the instruments that the state of Tennessee implemented to share testing information with the public (Tennessee Department of Education, 2007b).

Instrumentation

The instrument used in this study to assess student learning was part of the Tennessee Comprehensive Assessment Program (TCAP). The TCAP test items were developed by CTB McGraw Hill (Tennessee Department of Education, 2007a). The TCAP Achievement Test is a state-mandated exam administered to all students in grades 3-8 that tested basic skills and content application in reading, language arts, math, science, and social studies. During spring 2007, students in grades 3-8 were given a series of five achievement tests to provide a measure of academic skills (Tennessee Department of Education, 2007a).

The TCAP achievement test is a timed, multiple choice assessment that measured skills in reading, language arts, mathematics, science, and social studies. The total time for all components of the comprehensive test battery was approximately 5 hours; however, the length of the tests could vary depending on the grade level. The tests were broken into segments for students to take over several days (Tennessee Department of Education, 2007a).

The TCAP test was a criterion referenced test wherein a student's performance was measured against specific standards or criteria rather than against the performance of other test takers. The curriculum standards as defined by the State of Tennessee provided objectives for student accomplishment. From these objectives, performance indicators were written to describe how the objectives would be measured. On the TCAP Achievement Test, each test item was directly linked to a performance indicator and clustered into reporting categories for the reports given to students, parents, and teachers. The Reporting Categories Performance Index (RCPI) in 2007 ranged from 0-100 and was an estimate of the number of items the student was expected to answer correctly if there were 100 similar items on the test (Tennessee Department of Education, 2007c).

The TCAP test answers were machine scored. The student report listed the student's scale score and overall proficiency in each content area and identified whether the student was advanced, proficient, or needed improvement. Each reporting category in 2007 had its own proficiency range.

Students scoring below proficient demonstrated a lack of understanding of the essential concepts and skills of the content area. For 2007 the below proficient scale scores for reading-language arts were less than 479. In other words, the student had to

answer fewer than 24 questions correctly to have scored below proficient on the reading-language arts part of the TCAP test. In math, the below proficient scale scores were less than 479 or based on answering fewer than 27 questions correctly. The science below proficient scale scores were less than 191 or students that scored below proficient answered fewer than 28 questions correctly. In social studies students scale scores were less than 194 or based on answering fewer than 27 questions correctly (Tennessee Department of Education, 2007c)

To have scored proficient on the TCAP test students had to demonstrate general understanding of the essential concepts and skills of the content area on the TCAP assessment test. The proficient scale scores for reading-language arts ranged from 479-536. In other words, the student had to answer 24-47 questions correctly to score proficient on the reading-language arts part of the TCAP test. In math the proficient scale scores were 479-536 or the student had to answer 27-48 questions correctly. Science proficient scale scores ranged from 191-215 and the number correct for a proficient score was from 28-47. In social studies students had to answer 27-47 questions correctly and the proficient scale score ranged from 194-215 (Tennessee Department of Education, 2007c).

To score advanced on the TCAP test students' demonstrated application of complex concepts and skills of the content area on the TCAP assessment test (Tennessee Department of Education, 2007c). The advanced scale scores for reading-language arts ranged from 537-690, math from 537-710, science from 216-280, and social studies from 216-280. In other words, the student had to answer 48-67 questions correctly to score advanced on the reading-language arts part of the TCAP test. The number correct for an

advanced score ranged from 49-67 in math, 48-67 in science, and 48-67 in social studies (Tennessee Department of Education). Student results were reported to parents, teachers, and administrators (Tennessee Department of Education, 2007a).

Research Questions

The following research questions and null hypotheses guided the data analyses for this study:

Research Question 1

Is there a relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at each of the three classifications (below proficient, proficient, or advanced) in math on the TCAP achievement test?

Ho₁: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at each of the below proficient level in math on the TCAP achievement test.

Ho₂: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at each of the proficient level in math on the TCAP achievement test.

Ho₃: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at each of the advanced level in math on the TCAP achievement test.

Research Question 2

Is there a relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at each of the three classifications (below proficient, proficient, or advanced) in reading-language arts on the TCAP achievement test?

Ho2₁: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the below proficient level in reading-language arts on the TCAP achievement test.

Ho2₂: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the proficient level in reading-language arts on the TCAP achievement test.

Ho2₃: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the advanced level in reading-language arts on the TCAP achievement test.

Research Question 3

Is there a relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at each of the three classifications (below proficient, proficient, or advanced) in science on the TCAP achievement test?

Ho3₁: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the below proficient level in science on the TCAP achievement test.

Ho3₂: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the proficient level in science on the TCAP achievement test.

Ho3₃: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the advanced level in science on the TCAP achievement test.

Research Question 4

Is there a relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at each of the three classifications (below proficient, proficient, or advanced) in social studies on the TCAP achievement test?

Ho4₁: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the below proficient level in social studies on the TCAP achievement test.

Ho4₂: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the proficient level in social studies on the TCAP achievement test.

Ho4₃: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the advanced level in social studies on the TCAP achievement test.

Research Question 5

Is there a difference in the proportion of K-8 schools and 6-8 schools meeting Adequate Yearly Progress?

Ho5: There is no difference in the proportion of K-8 schools and 6-8 schools meeting AYP.

Data Analysis

Data for each group being studied were collected and organized for entry into a data file. Means were calculated for each group. The data were analyzed by running a t-test for independent means for research questions 1, 2, 3, and 4. The statistical results were used to decide whether the null hypotheses should be rejected or retained.

A Chi square test was used to determine if there was a difference in proportion of K-8 schools meeting AYP versus the number of 6-8 schools meeting AYP. The NCLB information, AYP, was reported as categorical, dichotomous data and coded. The statistics were analyzed to determine if the hypothesis should be rejected.

Summary

The methodology and procedures used in this study were presented in Chapter 3. The research design was presented and explained selection procedures for the population were described. Data for this study came from the state report of TCAP tests. Information about the TCAP test, as well as issues of reliability and validity, were also discussed in this Chapter 4. The findings of the study are reported and discussed in

Chapter 4. In Chapter 5, the summary, conclusions, implications, and recommendations are discussed.

CHAPTER 4

ANALYSIS OF DATA

This chapter contains the results of the data analyses as they relate to the six research questions proposed in Chapters 1 and 3. The purpose of this study was to determine if academic achievement as indicated by the Tennessee Comprehensive Assessment Program (TCAP) Achievement Test was different for 6th grade students enrolled in 6-8 schools and those enrolled in K-8 schools in the state of Tennessee. The study also addressed the relationship between school configuration and meeting Adequate Yearly Progress. The data were gathered from an analysis of mean standardized test scores in math, reading-language arts, science, and social studies for 6th-grade students in 137 school systems comprised of 342 schools located in the state of Tennessee. The Tennessee Comprehensive Assessment Program test scores were collected for the 2006-2007 school year for 6th grade students in K-8 and 6-8 schools. Chapter 4 is guided by five research questions and associated null hypotheses.

Analysis of Research Questions

Research Question 1

Is there a relationship between grade configuration (6-8 or K-8) and the percentage of 6th grade students scoring at each of the three classifications (below proficient, proficient, or advanced) in math on the TCAP achievement test?

Ho₁: There is no relationship between grade configuration (6-8 or K-8) and the percentage of 6th grade students scoring at the below proficient level in math on the TCAP achievement test.

An independent-samples *t* test was conducted to evaluate whether the percent of 6th grade students scoring at the below proficient level in math was different between K-8 and 6-8 schools. The percent of 6th grade students scoring below proficient was the test variable and the grouping variable was the configuration of the school (K-8 or 6-8). The test was not significant, $t(340) = -.48, p = .629$. Therefore, null hypothesis Ho:1₁ was retained. The η^2 index was $< .01$, which indicated a small effect size. The percentage of 6th grade students who scored below proficient in K-8 schools ($M = 10.44, SD = 9.90$) tended to be about the same as those in the 6-8 school configuration ($M = 10.89, SD = 6.95$). The 95% confidence level for the difference in means was -2.27 to 1.37. Figure 1 shows the distribution of the percentage of below proficient students in math for the two groups.

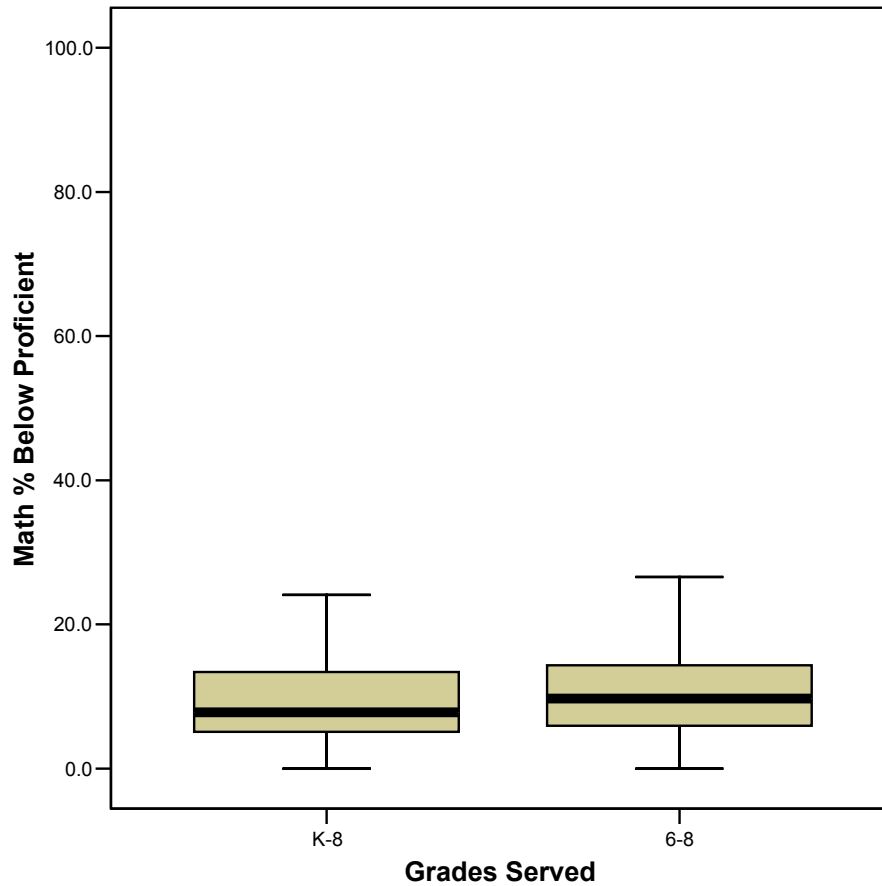


Figure 1. Distribution of the Percentage of Below Proficient Students in Math for the K-8 and 6-8 Groups.

H_{02} : There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the proficient level in math on the TCAP achievement test.

An independent-samples *t* test was conducted to evaluate whether the percent of 6th grade students scoring at the proficient level in math was different between K-8 and 6-8 schools. The percent of 6th grade students scoring proficient was the test variable and the grouping variable was the configuration of the school (K-8 or 6-8). The test was not

significant, $t(340) = 1.01, p = .314$. Therefore, null hypothesis $H_0:1_2$ was retained. The η^2 index was $< .01$, which indicated a small effect size. The percentage of 6th grade students who scored proficient in K-8 schools ($M = 49.12, SD = 13.26$) tended to be about the same as those in the 6-8 school configuration ($M = 47.76, SD = 11.56$). The 95% confidence level for the difference in means was -1.29 to 4.00. Figure 2 shows the distribution of the percentage of proficient students in math for the two groups.

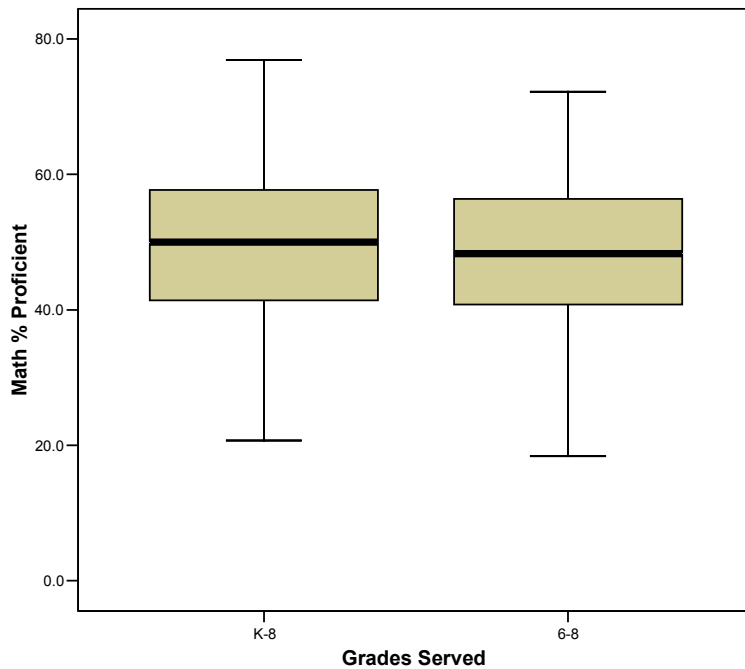


Figure 2. Distribution of the Percentage of Proficient Students in Math for the K-8 and 6-8 Groups.

H_{03} : There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the advanced level in math on the TCAP achievement test.

An independent-samples t test was conducted to evaluate whether the percent of 6th grade students scoring at the advanced level in math was different between K-8 and 6-

8 schools. The percent of 6th grade students scoring advanced was the test variable and the grouping variable was the configuration of the school (K-8 or 6-8). The test was not significant, $t(340) = .54, p = .589$. Therefore, null hypothesis $H_0: \mu_1 = \mu_2$ was retained. The η^2 index was $< .01$, which indicated a small effect size. The percentage of 6th grade students who scored advanced in K-8 schools ($M = 42.92, SD = 34.68$) tended to be about the same as those in the 6-8 school configuration ($M = 41.32, SD = 17.11$). The 95% confidence level for the difference in means was -4.22 to 7.42 . Figure 3 shows the distribution of the percentage of advanced students in math for the two groups.

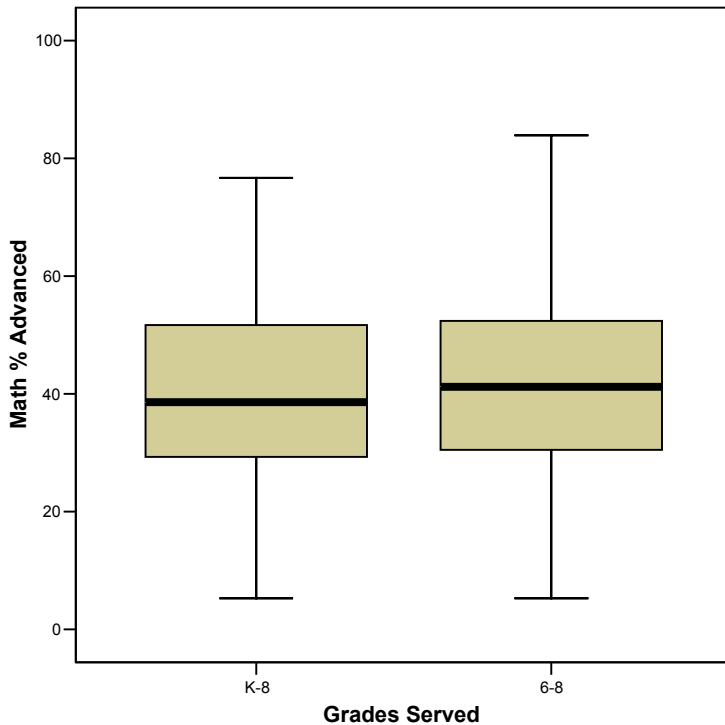


Figure 3. Distribution of the Percentage of Advanced Students in Math for the K-8 and 6-8 Groups.

Research Question 2

Is there a relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at each of the three classifications (below proficient, proficient, or advanced) in reading-language arts on the TCAP achievement test?

Ho₂₁: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the below proficient level in reading-language arts on the TCAP achievement test.

An independent-samples *t* test was conducted to evaluate whether the percent of 6th grade students scoring at the below proficient level in reading-language arts was different between K-8 and 6-8 schools. The percent of 6th grade students scoring below proficient was the test variable and the grouping variable was the configuration of the school (K-8 or 6-8). The test was not significant, $t(340) = -1.90, p = .059$. Therefore, null hypothesis Ho₂₁ was retained. The η^2 index was $< .01$, which indicated a small effect size. The percent of 6th grade students who scored below proficient in K-8 schools ($M = 7.28, SD = 6.95$) tended to be about the same as those in the 6-8 school configuration ($M = 8.81, SD = 7.94$). The 95% confidence level for the difference in means was -3.12 to 0.06. Figure 4 shows the distribution of the percentage of below proficient students in reading-language arts for the two groups.

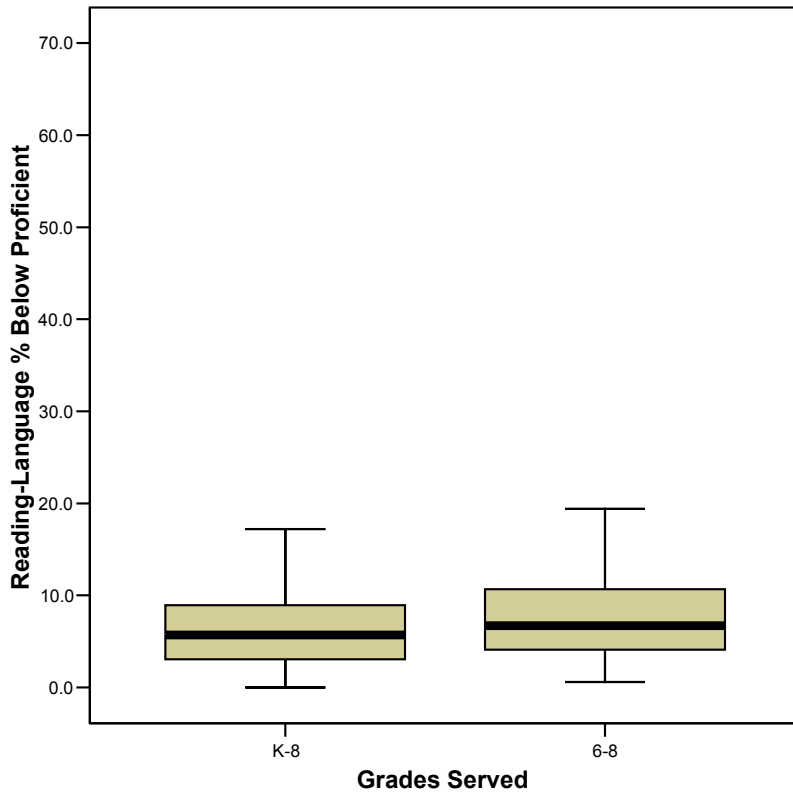


Figure 4. Distribution of the Percentage of Below Proficient Students in Reading-language arts for the K-8 and 6-8 Groups.

Ho₂: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the proficient level in reading-language arts on the TCAP achievement test.

An independent-samples *t* test was conducted to evaluate whether the percent of 6th grade students scoring at the proficient level in reading-language arts was different between K-8 and 6-8 schools. The percent of 6th grade students scoring proficient was the test variable and the grouping variable was the configuration of the school (K-8 or 6-8). The test was not significant, $t(340) = 1.56, p = .121$. Therefore, null hypothesis Ho₂ was retained. The η^2 index was $< .01$, which indicated a small effect size. The percentage

of 6th grade students who scored proficient in K-8 schools (M = 50.21, SD = 12.07 tended to be about the same as those in the 6-8 school configuration (M = 48.17, SD = 12.11). The 95% confidence level for the difference in means was -0.54 to 4.60. Figure 5 shows the distribution of the percentage of proficient students in reading-language arts for the two groups.

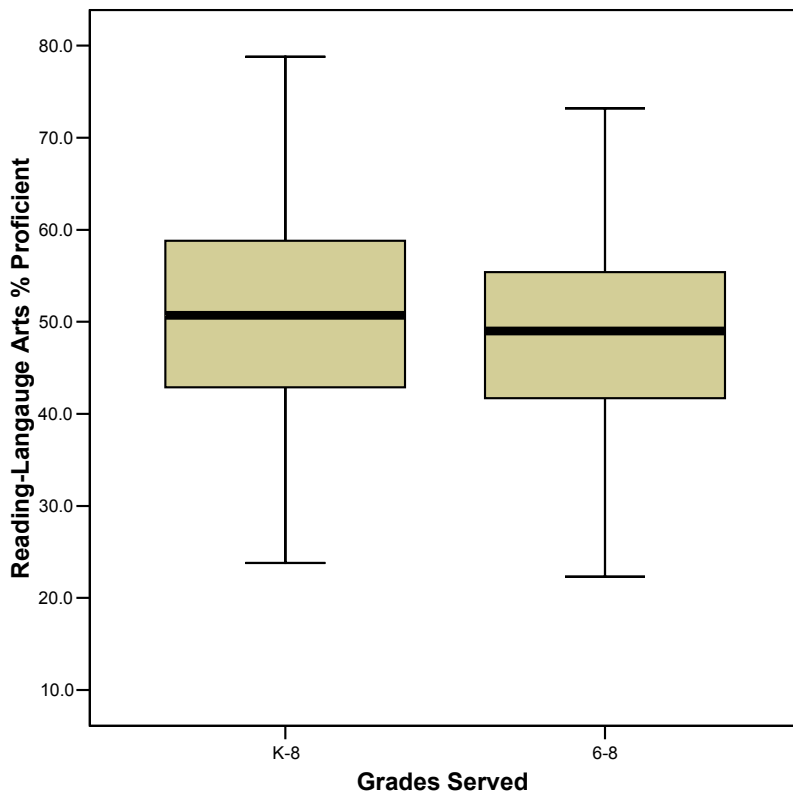


Figure 5. Distribution of the Percentage of Proficient Students in Reading-language arts for the K-8 and 6-8 Groups.

Ho₂₃: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the advanced level in reading-language arts on the TCAP achievement test.

An independent-samples t test was conducted to evaluate whether the percent of 6th grade students scoring at the advanced level in reading-language arts was different between K-8 and 6-8 schools. The percent of 6th grade students scoring advanced was the test variable and the grouping variable was the configuration of the school (K-8 or 6-8). The test was not significant, $t(340) = -.26, p = .797$. Therefore, null hypothesis $H_0: \mu_1 = \mu_2$ was retained. The η^2 index was $< .01$, which indicated a small effect size. The percentage of 6th grade students who scored advanced in K-8 schools ($M = 42.34, SD = 15.33$) tended to be about the same as those in the 6-8 school configuration ($M = 42.79, SD = 16.90$). The 95% confidence level for the difference in means was -3.88 to 2.98 . Figure 6 shows the distribution of the percentage of advanced students in reading-language arts for the two groups.

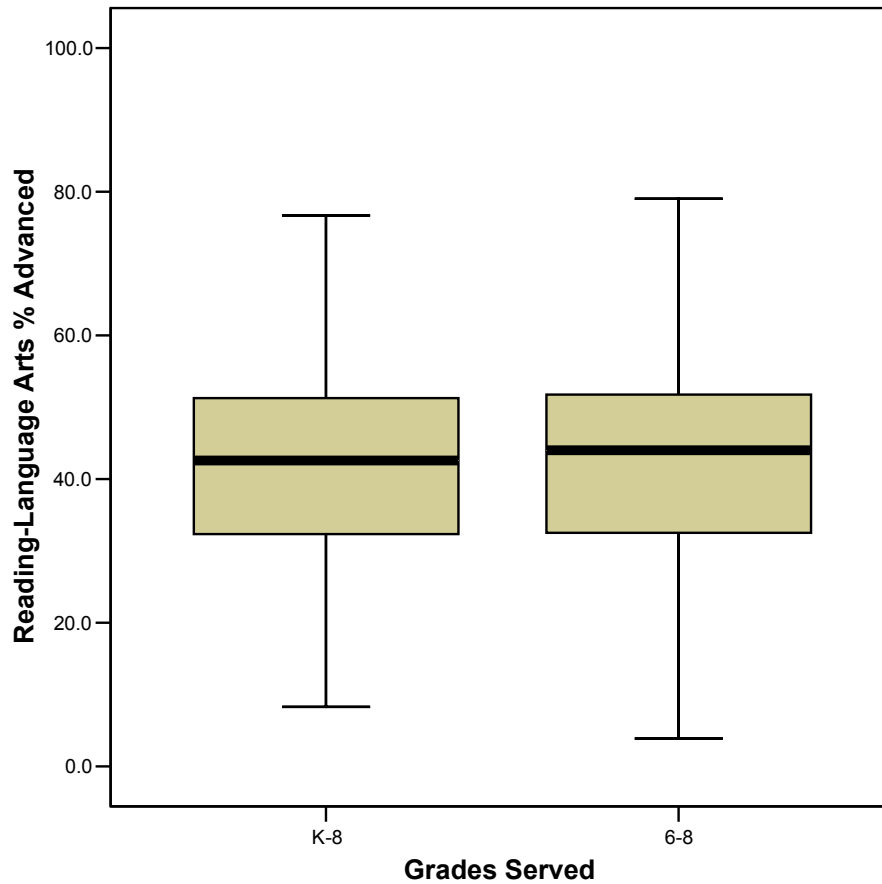


Figure 6. Distribution of the Percentage of Advanced Students in Reading-language arts for the K-8 and 6-8 Groups.

Research Question 3

Is there a relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at each of the three classifications (below proficient, proficient, or advanced) in science on the TCAP achievement test?

Ho3₁: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the below proficient level in science on the TCAP achievement test.

An independent-samples *t* test was conducted to evaluate whether the percent of 6th grade students scoring at the below proficient level in science was different between K-8 and 6-8 schools. The percent of 6th grade students scoring below proficient was the test variable and the grouping variable was the configuration of the school (K-8 or 6-8). The test was significant, $t(340) = -2.39, p = .017$. Therefore, null hypothesis Ho:3₁ was rejected. The η^2 index was $< .02$, which indicated a small effect size. A lower percentage of 6th grade students in K-8 schools scored below proficient ($M = 12.87, SD = 8.59$) than did 6th grade students in 6-8 schools ($M = 15.57, SD = 11.99$). The 95% confidence level for the difference in means was -4.92 to -0.48. Figure 7 shows the distribution of the percentage of below proficient students in science for the two groups.

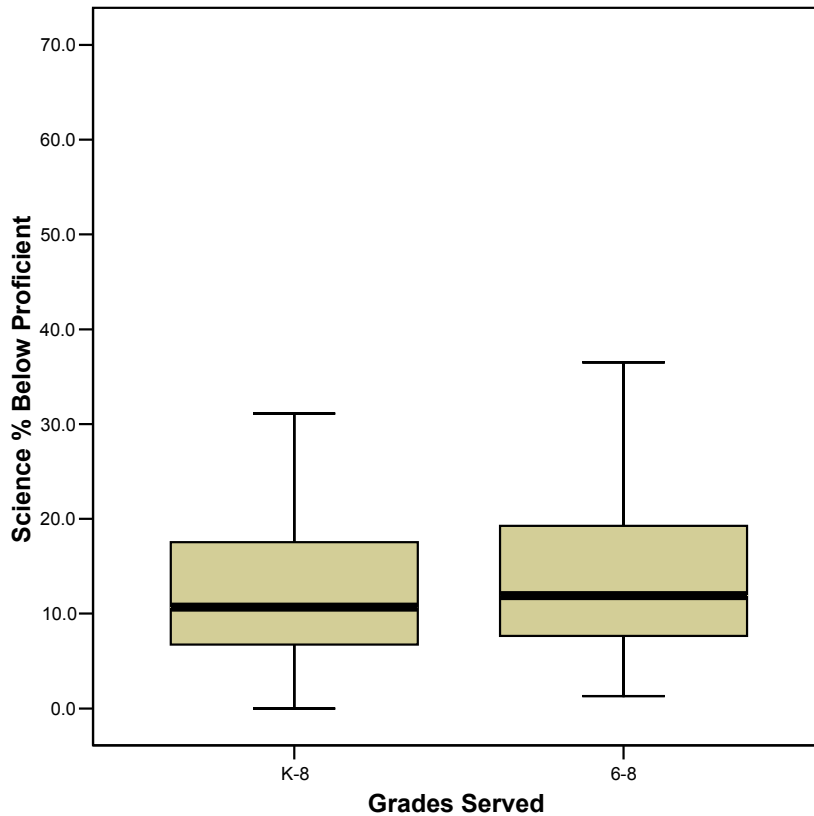


Figure 7. Distribution of the Percentage of Below Proficient Students in Science for the K-8 and 6-8 Groups.

Ho₃₂: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the proficient level in science on the TCAP achievement test.

An independent-samples *t* test was conducted to evaluate whether the percent of 6th grade students scoring at the proficient level in science was different between K-8 and 6-8 schools. The percent of 6th grade students scoring proficient was the test variable and the grouping variable was the configuration of the school (K-8 or 6-8). The test was significant, $t(340) = 4.97, p < .001$. Therefore, null hypothesis Ho₃₂ was rejected. The

η^2 index was .07, which indicated a medium effect size. A higher percentage of 6th grade students in K-8 schools scored proficient (M = 57.59, SD = 11.04) than did 6th grade students in 6-8 schools (M = 52.10, SD = 9.35). The 95% confidence level for the difference in means was 3.32 to 7.67. Figure 8 shows the distribution of the percentage of proficient students in science for the two groups.

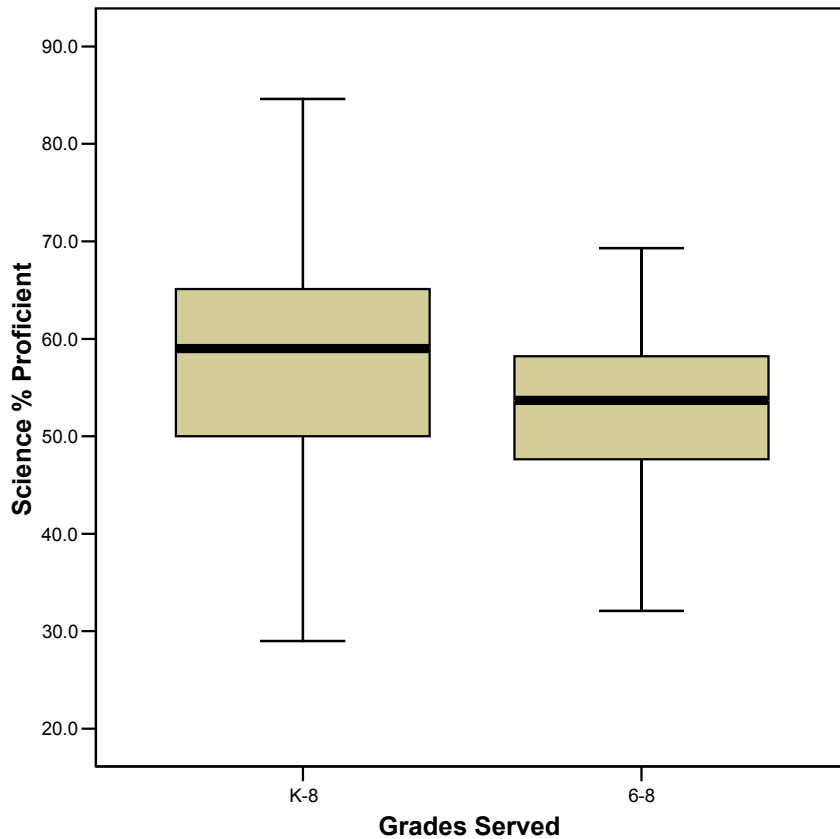


Figure 8. Distribution of the Percentage of Proficient Students in Science for the K-8 and 6-8 Groups.

Ho₃: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the advanced level in science on the TCAP achievement test.

An independent-samples t test was conducted to evaluate whether the percent of 6th grade students scoring at the advanced level in science was different between K-8 and 6-8 schools. The percent of 6th grade students scoring advanced was the test variable and the grouping variable was the configuration of the school (K-8 or 6-8). The test was not significant, $t(340) = -1.65, p = .100$. Therefore, null hypothesis $H_0:3_3$ was retained. The η^2 index was $< .01$, which indicated a small effect size. The percentage of 6th grade students who scored advanced in K-8 schools ($M = 29.53, SD = 14.49$) tended to be about the same as those in the 6-8 school configuration ($M = 32.33, SD = 16.93$). The 95% confidence level for the difference in means was -6.16 to 0.55 . Figure 9 shows the distribution of the percentage of advanced students in science for the two groups.

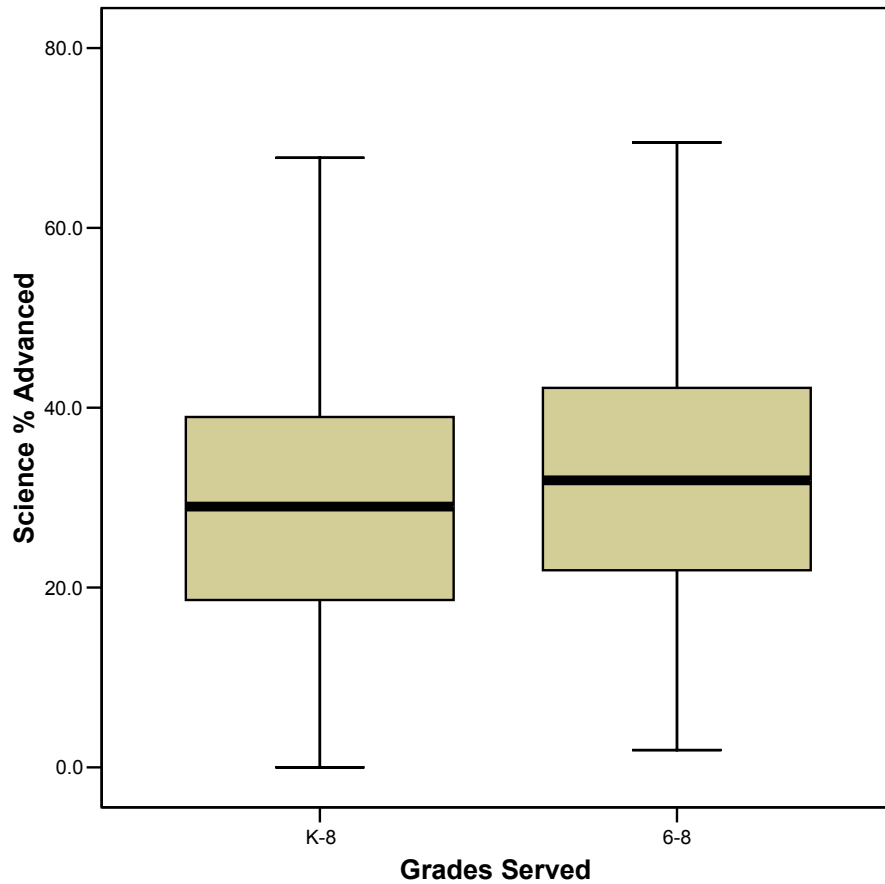


Figure 9. Distribution of the Percentage of Advanced Students in Science for the K-8 and 6-8 Groups.

Research Question 4

Is there a relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at each of the three classifications (below proficient, proficient, or advanced) in social studies on the TCAP achievement test?

Ho4₁: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the below proficient level in social studies on the TCAP achievement test.

An independent-samples t test was conducted to evaluate whether the percent of 6th grade students scoring at the below proficient level in social studies was different between K-8 and 6-8 schools. The percent of 6th grade students scoring below proficient was the test variable and the grouping variable was the configuration of the school (K-8 or 6-8). The test was not significant, $t(340) = -.74, p = .463$. Therefore, null hypothesis $H_0: \mu_1 = \mu_2$ was retained. The η^2 index was .01, which indicated a small effect size. The percentage of 6th grade students who scored below proficient in K-8 schools ($M = 20.29, SD = 11.41$) tended to be about the same as those in the 6-8 school configuration ($M = 21.26, SD = 12.92$). The 95% confidence level for the difference in means was -3.56 to 1.62 . Figure 10 shows the distribution of the percentage of below proficient students in social studies for the two groups.

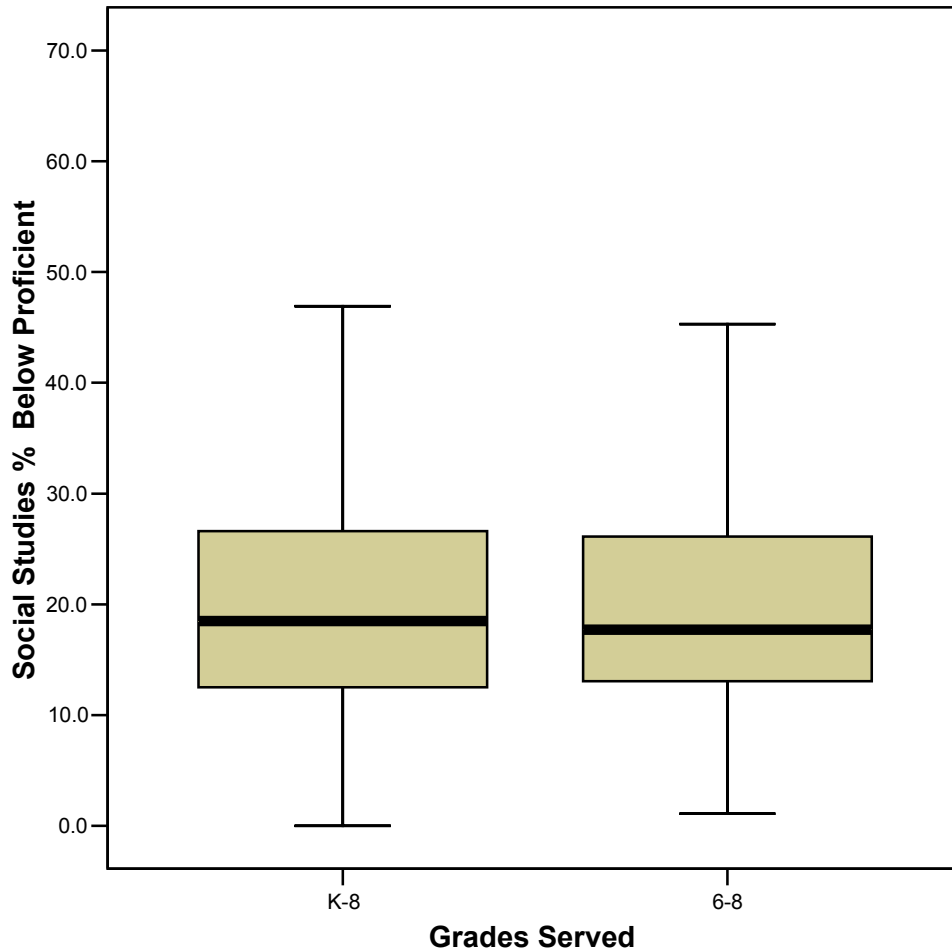


Figure 10. Distribution of the Percentage of Below Proficient Students in Social Studies for the K-8 and 6-8 Groups.

Ho₄: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the proficient level in social studies on the TCAP achievement test.

An independent-samples *t* test was conducted to evaluate whether the percent of 6th grade students scoring at the proficient level in social studies was different between K-8 and 6-8 schools. The percent of 6th grade students scoring proficient was the test

variable and the grouping variable was the configuration of the school (K-8 or 6-8). The test was significant, $t(340) = 6.84, p < .001$. Therefore, null hypothesis $H_0: \mu_1 = \mu_2$ was rejected. The η^2 index was .12, which indicated a medium effect size. A higher percentage of 6th grade students in K-8 schools scored proficient ($M = 60.19, SD = 9.23$) than did 6th grade students in 6-8 schools ($M = 53.54, SD = 8.73$). The 95% confidence level for the difference in means was 4.73 to 8.55. Figure 11 shows the distribution of the percentage of proficient students in social studies for the two groups.

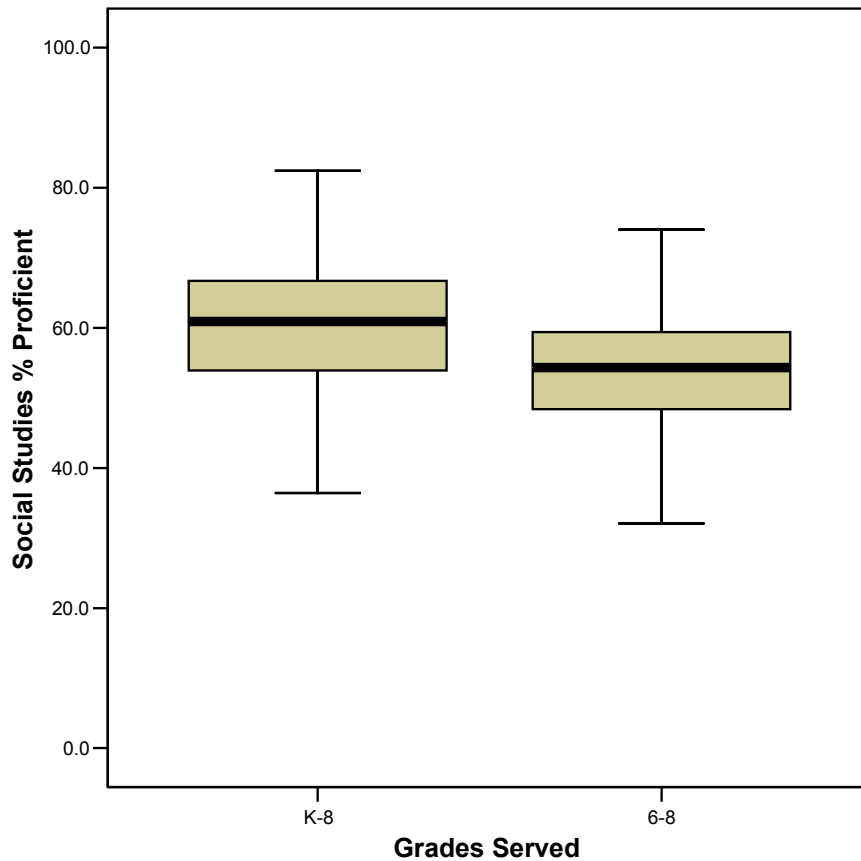


Figure 11. Distribution of the Percentage of Proficient Students in Social Studies for the K-8 and 6-8 Groups.

Ho4₃: There is no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the advanced level in social studies on the TCAP achievement test.

An independent-samples *t* test was conducted to evaluate whether the percent of 6th grade students scoring at the advanced in social studies was different between K-8 and 6-8 schools. The percent of 6th grade students scoring advanced was the test variable and the grouping variable was the configuration of the school (K-8 or 6-8). The test was significant, $t(340) = -3.81, p < .001$. Therefore, null hypothesis Ho:4₃ was rejected. The η^2 index was .04, which indicated a medium effect size. A higher percentage of 6th grade students in 6-8 schools scored advanced ($M = 25.08, SD = 14.76$) than did 6th grade students in K-8 schools ($M = 19.44, SD = 12.45$). The 95% confidence level for the difference in means was -8.54 to -2.73. Figure 12 shows the distribution of the percentage of advanced students in social studies for the two groups.

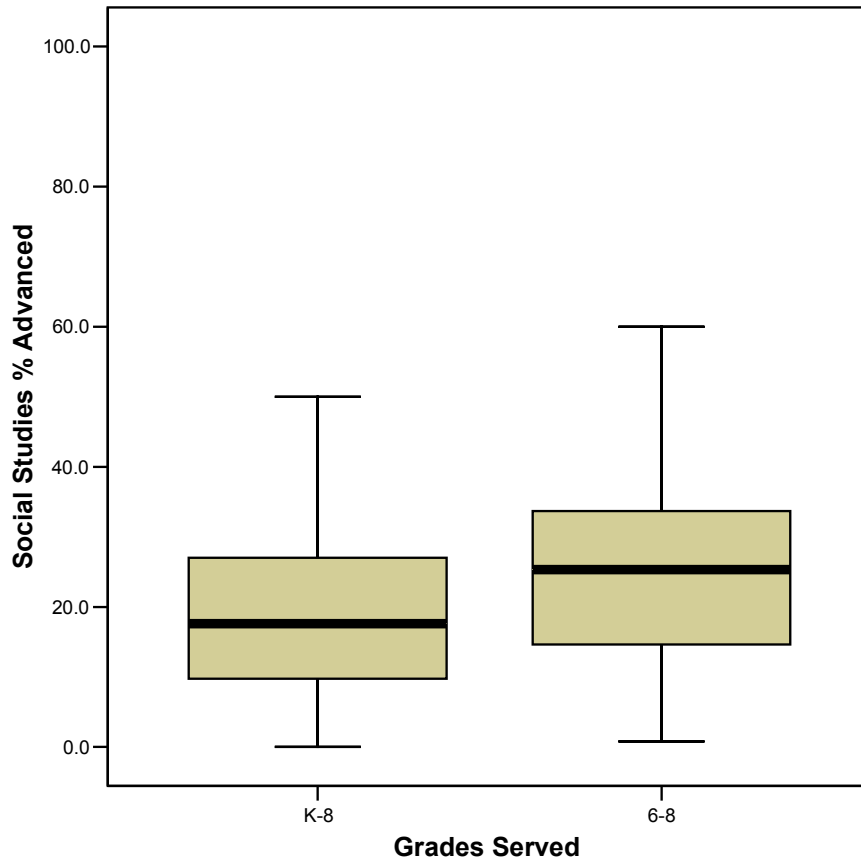


Figure 12. Distribution of the Percentage of Advanced Students in Social Studies for the K-8 and 6-8 Groups.

Research Question 5

Is there a difference in the proportion of K-8 schools and 6-8 schools meeting Adequate Yearly Progress?

H₀5: There is no difference in the proportion of K-8 schools and 6-8 schools meeting AYP.

A Chi-square was conducted to evaluate whether AYP was being met in K-8 schools and 6-8 schools. The two variables were school configurations (K-8 and 6-8) and AYP (yes or no). AYP status and school configuration were found to be significantly

related, Pearson $\chi^2 (2, N = 342) = 26.76, p < .001$. The schools meeting AYP and not meeting AYP are reported in Figure 13. Figure 13 shows the number of K-8 and 6-8 schools meeting AYP.

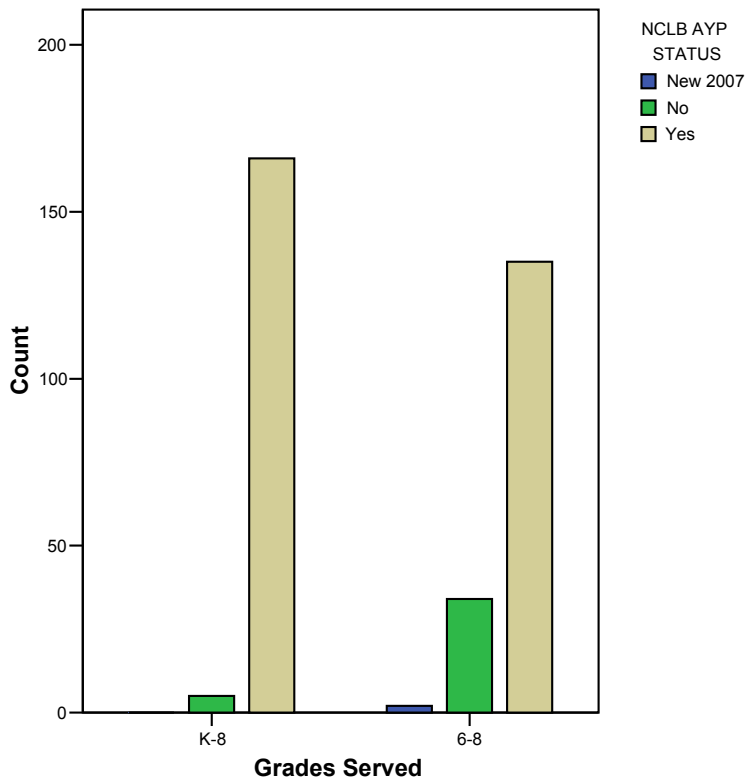


Figure 13. The Number of K-8 and 6-8 Schools Meeting AYP.

The data were analyzed by running a t-test for independent means for research questions 1, 2, 3, and 4. Table 1 is a summary of *t* tests for all subjects.

Table 1
Summary of t Tests for All Subjects

Subject	Grades Served	N	M	SD	<i>t</i>	<i>p</i>
Math Below Proficient	K - 8	171	10.44	9.90	-.48	.629
	6 - 8	171	10.89	6.95		
Math Proficient	K-8	171	49.12	13.26	1.01	.314
	6-8	171	47.76	11.56		
Math Advanced	K-8	171	42.92	34.68	.54	.589
	6-8	171	42.32	17.11		
Reading-Language Below Proficient	K-8	171	7.28	6.95	-1.90	.059
	6-8	171	8.81	7.94		
Reading-Language Proficient	K-8	171	50.21	12.07	1.56	.121
	6-8	171	48.17	12.11		
Reading-Language Advanced	K-8	171	42.34	15.33	-.26	.797
	6-8	171	42.79	16.90		
Science Below Proficient	K-8	171	12.87	8.59	-2.39	.017
	6-8	171	15.57	11.99		
Science Proficient	K-8	171	57.59	11.04	4.97	<.001
	6-8	171	52.10	9.35		
Science Advanced	K-8	171	29.53	14.49	-1.65	.100
	6-8	171	32.33	16.93		
Social Studies Below Proficient	K-8	171	20.29	11.41	-.74	.463
	6-8	171	21.26	12.92		
Social Studies Proficient	K-8	171	60.19	9.23	6.84	<.001
	6-8	171	53.54	8.73		
Social Studies Advanced	K-8	171	19.44	12.45	-3.81	<.001
	6-8	171	25.08	14.76		

CHAPTER 5

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to determine whether academic achievement as indicated by the Tennessee Comprehensive Assessment Program (TCAP) Achievement Test, was different for 6th grade students enrolled in 6-8 schools and those enrolled in K-8 schools in the state of Tennessee. The study also addressed the relationship between school configuration and meeting Adequate Yearly Progress. The data were gathered from an analysis of mean standardized test scores in math, reading-language arts, science, and social studies for 6th-grade students in 342 schools located in the state of Tennessee. The Tennessee Comprehensive Assessment Program test scores were collected for the 2006-2007 school year for 6th grade students in K-8 and 6-8 schools. A summary of conclusions and recommendations for further research and practice follows.

Summary of the Study

The relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the below proficient, proficient, and advanced level in each subject area was examined. The analysis was based on five research questions. A *t*-test for independent samples was used to identify the relationships between the independent variables, configuration of the school (K-8 or 6-8), and the dependent variables, the percent of students scoring below proficient, proficient, or advanced. A Chi square analysis was used to identify the relationship between the proportions of K-8 schools meeting AYP and the number of 6-8 schools meeting AYP.

Summary of the Findings

The study showed no relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the below proficient level in math, reading-language arts, or social studies. Similarly, there was no significant difference between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the proficient level in math and reading-language arts. The study found no relationship between grade configuration (6-8 and K-8) and percent of 6th grade students scoring at the advanced level in math, reading-language arts, and science. However, there was a significant relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the below proficient level and the proficient level in science and the percent of 6th grade students scoring at the proficient level and advanced level in social studies. In science, a significantly lower percentage of 6th grade students in K-8 schools scored below proficient than did 6th grade students in 6-8 schools. In science, a significantly higher percentage of 6th grade students in K-8 schools scored proficient than did 6th grade students in 6-8 schools. In social studies, a significantly higher percentage of 6th grade students in K-8 schools scored proficient than did 6th grade students in 6-8 schools. However, in social studies a significantly higher percentage of 6th grade students in 6-8 schools scored advanced than did 6th grade students in K-8 schools. The study showed a significantly higher number of K-8 schools meeting AYP versus the number of 6-8 schools meeting AYP.

Conclusions

Previous research indicated a shift in student motivation, one that caused them to perform at minimum expectation levels, which produced an achievement gap during the middle school transition years (Alspaugh, 1998; Alspaugh & Harting, 1995). With the new age of standards and accountability, school administrators recognized the special needs of middle grade students. Many were concerned with minimizing the impact the transition might have on achievement scores (Alspaugh, 1998). This study examined the relationship between grade configuration (6-8 or K-8) and percent of 6th grade students scoring at the below proficient, proficient, and advanced level in each subject area in hopes of identifying whether one configuration had educational significance over the other.

The results of the study suggested that grade span configuration alone did not account for 6th grade students' academic achievement as measured by the TCAP test. The results were consistent with findings by Johnson (2002) in a study of rural students in South Dakota in which no significant difference was found in achievement of students who transitioned to a new school after the 5th or 6th grade. The study included only rural students and used scores from the Scholastic Aptitude Test, 9th Edition (SAT 9). On the other hand, Alspaugh (1998) found there was significant achievement loss associated with transitioning from elementary to middle school in 6th grade compared with K-8 schools that did not require the transition in 6th grade. That finding contrasted with the results of the current study. In addition, results of this study contrasted with the results of studies by Franklin and Glascock (1998) and Cook et al. (2007) that found placing

students in middle schools increased behavior problems and reduced academic achievement.

In the current study no conclusive data suggested one particular grade configuration was superior to another. The results varied according to subject matter. When looking at the results, there were statistically significant differences between 6th grade students in K-8 schools and 6-8 schools in science and social studies. Results from this study were inconclusive and it appeared that 6th grade students did equally well in both grade configurations.

Although the significant differences were only in science and social studies, questions and possible reasons of educational significance could be inferred from the results. Effective teachers could be the foremost influence that may cause scores to vary. Administrators should recognize the importance of hiring. Many K-8 schools differ in the way they use their teachers. Many 6th grade teachers at K-8 schools teach all subjects or team teach with another teacher and split the curriculum. By splitting the curriculum, many teachers focus on math and language arts and integrate science into those subjects, which may account for the higher percentage of K-8 students scoring proficient. Meanwhile, the 6th grade students attending the 6-8 schools have teachers who focus on one particular subject. Middle school students study each subject every day for an equal amount of time. Social studies is often a subject that is taught in the K-8 schools when time permits. This might explain the higher percentage of 6-8 students scoring at the advanced level in social studies.

The study showed a significant difference in the proportion of K-8 schools meeting AYP versus the number of 6-8 schools meeting AYP. In Tennessee, under the

No Child Left Behind Act regulations, schools are measured on whether the students meet performance benchmarks in math, reading-language arts, and attendance. In math 86% of students must have scored at the proficient or advanced levels. In reading-language arts 89% of students must have scored at the proficient or advanced levels. The attendance rate of 93% must be met in order for a school to meet AYP. AYP status is also calculated each year for the following student subgroups: White, Hispanic, African American, Native American, Asian, Pacific Islander, Economically Disadvantaged, Students with Disabilities, and English Language Learners. In the current study, attendance might have been a factor in the 6-8 schools not meeting AYP. In addition to attendance, many schools failed to meet AYP in the Students with Disabilities subgroup.

Recommendations for Practice

In this study there were no conclusive data that suggested a particular grade configuration as better than another. The results implied that some other reason or reasons affected achievement scores in the middle grades. Local school officials could use the information obtained from the study as one facet of their decision-making process when reviewing grade span configurations and academic achievement in their district. However, local decisions about school configurations should include other factors such as projected enrollments, transportation costs, size of schools, school goals, fiscal constraints, political tensions, geographic realities, and financial accountability (Coladarci & Hancock, 2002; Howley, 2002). As student populations shift, educational leaders should seek grade span configurations that best fit their community culture and

current facilities, focusing financial resources on other means of improving academic achievement.

Recommendations for Further Research

Further research should be conducted to examine school configuration and the effects of attendance and disciplinary actions while considering the variables of gender, ethnicity, and socioeconomic status on academic achievement. Additional research is needed to explore the effects of emotional support for the children during the transition to middle school. Further study of possible interventions is an area in need of research.

The effects on achievement and discipline for middle school students from a modified departmentalized program or a mentoring program should be researched. Additional research is needed to examine the long term effects on achievement of eighth grade students in the transition to high school from a 6-8 school and a K-8 school. A longitudinal study could examine graduation rates, ACT/SAT scores, and dropout rates of students who attended a K-8 configuration and students who attended a 6-8 configuration.

There is little disagreement that adolescent children in the middle grades (6-8) face additional emotional and physical changes. Students in the middle grades offer a set of unique challenges to educators. These recommendations are meant to present information to teachers and administrators in an attempt to bridge the educational gap as they accommodate students during this difficult time.

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VITA

WHITNEY J. RAMSEY

Personal Data: Date of Birth: September 30, 1981
Place of Birth: Bristol, Tennessee
Marital Status: Single

Education: East Tennessee State University, Johnson City, Tennessee;
Interdisciplinary Studies, B.S.,
2004

East Tennessee State University, Johnson City, Tennessee;
Elementary Education, M.Ed.,
2005

East Tennessee State University, Johnson City, Tennessee;
Educational Leadership and Policy Analysis, Ed.D.,
2009

Professional
Experience: Teacher, Blountville Middle School; Blountville,
Tennessee, 2004-Present

Professional
Achievements: Co-Chair School Improvement Team

Curriculum Committee

Assistant Cheerleading Coach