

**A STUDY OF THE IMPACT OF COMMON CORE ON THE ACADEMIC
ACHIEVEMENT OF THIRD THROUGH FIFTH GRADERS IN ONE MIDDLE
TENNESSEE METROPOLITAN SCHOOL DISTRICT**

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Alysia Durham

A STUDY OF THE IMPACT OF COMMON CORE ON THE ACADEMIC
ACHIEVEMENT OF THIRD THROUGH FIFTH GRADERS IN ONE MIDDLE
TENNESSEE METROPOLITAN SCHOOL DISTRICT

A Field Study Report

Presented to

The College of Graduate Studies

Austin Peay State University

In Partial Fulfillment

Of

The Requirements for the Degree

Educational Specialist

Alysia Durham

December, 2014

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By

Alysia M. Durham

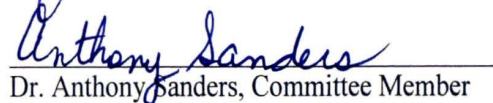
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December, 2014

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We are submitting a Field Study Report written by Alysia M. Durham entitled “A Study of The Impact of Common Core on the Academic Achievement of Third through Fifth Graders in One Middle Tennessee Metropolitan School District.” We have examined the final copy of this Field Study Report for form and content. We recommend that it be accepted in partial fulfillment of the requirements for the degree of Educational Specialist Degree in School Administration and Leadership.

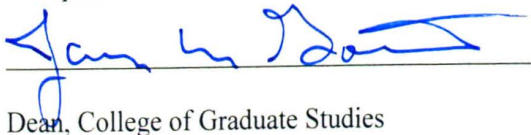


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ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to my chair, Dr. J. Gary Stewart, for his expertise, and incredible amount of support that assisted and guided me through this process. His patience and commitment to my learning and achievement did not go unnoticed. Also I would like to thank my co-worker and friend, Amy Gammons, for all of her help throughout my journey.

DEDICATION

I would like to dedicate this field study to my awesome husband and best friend, Joshua Durham. With his continuous love and support I have been able to complete this journey. Thank you for understanding all of the days and nights that I was forced to be in front of the computer, working towards my goals. Additionally, I would also like to express a special feeling of gratitude to my father, Mark Latchford, who has taught me that through hard work, dedication, and determination, all things are possible.

ABSTRACT

ALYSIA M. DURHAM. “A Study of the Impact of Common Core on the Academic Achievement of Third through Fifth Graders in One Middle Tennessee Metropolitan School District” (Under the direction of DR. J. GARY STEWART).

The purpose of this study was to explore the impact that the implementation of the Common Core Standards has had on academic achievement with regards to the TCAP annual assessment scores for the students in grades three through five. This study utilized a non-experimental, casual comparative research design (ex post facto research) to identify any statistical significance between the implementation of the Common Core Standards and student academic achievement. Archival data was retrieved from a school district in Middle Tennessee from three grade levels for four years to compare the TCAP scores before and after the implementation of the Common Core Standards.

Based on this study, there was a statistically significant difference between the implementation of Common Core State Standards and student achievement on the TCAP based on NCE scores. Each grade level had different results, but all had shown a negative mean difference since the implementation of the new standards.

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CHAPTER I

INTRODUCTION

Statement of the Problem

Today's schools are continually searching for new and innovative ways to educate children. Policies have changed over the years regarding children's education. As stated by the U.S. Department of Education (2004), the No Child Left-Behind Act of 2001 increased the accountability and flexibility, in addition to federal support for education. Many would like to make changes to the current act, noting that it is not the best mold for our students today. It has become very evident that teaching styles need to be altered to meet the needs of a very diverse student population. Because of this, twenty-first century learning and teaching methods are being introduced and implemented within schools to better meet the needs of the students.

Along with that comes the Common Core initiative, which was introduced to schools in Tennessee in 2010. The initiative was developed by David Coleman who maintained the proposition that all stakeholders should be on the same page, working together toward shared goals. When everyone has open lines of communication, educators will be able to know exactly what is needed to help their students learn, thereby establishing more individualized benchmarks to assess their level of achievement. As proposed by the National Governors Association Center for Best Practices (2010), Common Core focuses on foundations of conceptual understanding. Teachers are able to spend more time teaching subject matter, skills, and concepts using teaching procedures that better insure the success of each and every student. Having more time to focus on key elements, allows students the opportunity to master concepts according to skill level.

In recent years, most states have begun adopting the Common Core initiative. All states, except Alaska, Minnesota, Nebraska, Texas, and Virginia, have adopted the Common Core initiative. Additionally, the Common Core Initiative has been adopted by the District of Columbia. The Common Core initiative is believed to be the first step in providing young people with a high-quality education. When this has been accomplished, it is believed that schools can better ensure that students make progress every year and graduate from high school with the skills needed to succeed in college and in a modern workforce.

Purpose of the Study

The purpose of this study was to use a population within the Dickson County School System, to help determine if the schools' implementation of the Common Core Standards has had an affect on the academic performance of grade school students as measured by the Tennessee Comprehensive Assessment Program (TCAP) Tests. This study seeks to determine if a large proportion of the students have increased their test scores on the TCAP at all grade levels, third through the fifth grade, in the areas of Mathematics, Reading, Science and Social Studies.

Significance of the Study

The Common Core State Standards initiative was first adopted by Tennessee in 2010. Small improvements are continually being made in the overall readiness for life of students after graduation. However, standardized test scores have not shown significant gains. Determining whether or not the schools' implementation of the Common Core Standards has had an effect on student academic performance is incredibly important to educators, parents, and students of Dickson County.

Research Questions

The following research questions were generated at the outset of this study and were used to formulate the null hypotheses:

1. Is there a significant difference in the academic performance of third graders on the TCAP in the areas of Mathematics, Reading, Science, and Social Studies after the implementation of the Common Core Standards?
2. Is there a significant difference in the academic performance of fourth graders on the TCAP in the areas of Mathematics, Reading, Science, and Social Studies after the implementation of the Common Core Standards?
3. Is there a significant difference in the academic performance of fifth graders on the TCAP in the areas of Mathematics, Reading, Science, and Social Studies after the implementation of the Common Core Standards?

Null Hypotheses

The following null hypotheses were formulated based on the research questions and the need to help determine if the schools' implementation of the Common Core Standards has had an effect on the academic performance of grade school students as measured by the Tennessee Comprehensive Assessment Program (TCAP) Tests in a Middle Tennessee School System.

1. There will be no statistically significant difference in the academic performance of third graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Mathematics after the implementation of the Common Core Standards.

2. There will be no statistically significant difference in the academic performance of third graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Reading after the implementation of the Common Core Standards.

3. There will be no statistically significant difference in the academic performance of third graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Science after the implementation of the Common Core Standards.

4. There will be no statistically significant difference in the academic performance of third graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Social Studies after the implementation of the Common Core Standards.

5. There will be no statistically significant difference in the academic performance of fourth graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Mathematics after the implementation of the Common Core Standards.

6. There will be no statistically significant difference in the academic performance of fourth graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Reading after the implementation of the Common Core Standards.

7. There will be no statistically significant difference in the academic performance of fourth graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Science after the implementation of the Common Core Standards.

8. There will be no statistically significant difference in the academic performance of fourth graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Social Studies after the implementation of the Common Core Standards.

9. There will be no statistically significant difference in the academic performance of fifth graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Mathematics after the implementation of the Common Core Standards.

10. There will be no statistically significant difference in the academic performance of fifth graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Reading after the implementation of the Common Core Standards.

11. There will be no statistically significant difference in the academic performance of fifth graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Science after the implementation of the Common Core Standards.

12. There will be no statistically significant difference in the academic performance of fifth graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Social Studies after the implementation of the Common Core Standards.

Limitations

The following limitations are appropriate for this study based on the demographics and the date used for the study:

1. This study included elementary school students who were enrolled in the Dickson County School System during the 2011-2014 school years. Due to the demographics, data analysis cannot be generalized across populations unless the schools have similar demographics.

2. It must be accepted that the Tennessee Comprehensive Assessment Program (TCAP) is an accurate measurement for student achievement.

3. Other factors such as years of teaching experience and teaching styles could have an impact on TCAP scores.

Assumptions

The following assumptions were made concerning this study and have been identified as being relevant in this study:

1. It is assumed that each school used the same methods of implementing the common core.
2. It is assumed that the Tennessee Comprehensive Assessment Program (TCAP) is a valid assessment of academic achievement in relation to the implementation of common core standards.

Definition of Term(s)

The following terms have been identified for providing clarification or a definition that is appropriate to how they are used in this study:

1. **Common Core:** Common Core is a rigorous set of standards for the English Language Arts and Mathematics curriculum that has been developed based on the best practices of schools and organizations around the country and the world as noted by the Common Core State Standards Initiative (n.d.).
2. **Achievement:** Achievement is something that has been done or achieved through effort; a result of hard work according to Merriam-Webster (n.d.).
3. **Tennessee Comprehensive Assessment Program (TCAP):** The Tennessee Department of Education (n.d.) refers to the Tennessee Comprehensive Assessment Program, or TCAP, as a set of state-wide assessments given in Tennessee to measure students' skills and progress.

4. **NCE Score:** The NCE or Normal Curve Equivalency is a way of standardizing scores received on a test into a 0-100 scale similar to a percentile-rank, but preserving the valuable equal-interval properties of a z-score as noted by Hills (1984).
5. **PARCC:** PARCC represents the Partnership for Assessment of Readiness for College and Careers, which is a group of states working together to develop a set of assessments that measure student performance in relation to college and careers, according to PARCC (2012).

CHAPTER II

REVIEW OF LITERATURE

Introduction

The world is steadily evolving. On a daily basis, the competition for creative and innovative people to fill the necessary positions in today's workforce is fierce. The expectations for the college graduate are considerably different in today's society than ever before. According to Ashoka (2014), in order to thrive in an interconnected world, students must learn a number of crucial, non-academic skills. For example, it is crucial they develop a clear understanding of these non-academic skills and how they relate to various perspectives, many that are different and in conflict with their own. Some of these skills include mastering the concept of teamwork, developing and utilizing critical and creative thinking, as well as developing into an adept problem-solver. The expectation of education is changing and evolving at a rapid pace. Therefore, schools are altering the teaching process, the delivery systems, the ways in which students are taught to think and problem-solve, as well as an understanding of the relationship of what they learn to the world around them so that they can better prepare students for a successful future.

Preparing students for the future is more important now, in the Twenty-first Century, than ever before. As the expectations and the contexts in which students learn continue to change, there is increasing pressure on the K-12 educational system and educators to fundamentally change how we define and support teaching and learning for global competence as Ashoka (2014) observed. Global learning must no longer be reserved for just the high-achieving students or limited to a small number of districts.

Closing the ever increasing gap that exists between the learning that, too often, takes place in school and the interactive, hands-on, learning that usually takes place out-of-school, must become a priority for our schools, according to Digital Media and Learning Research Hub (n.d.). Educators must take full advantage of the Internet's ability to help students develop knowledge and expertise, skills and important new literacy. Digital Media and Learning Research Hub (n.d.), proposes that digital technology can be extremely useful in winning the fight against the increasing reality of the haves and have-nots in education. The purpose of this literature review is to address the following questions and topics and issues:

- 1) Causes of changes in educational standards in Tennessee
- 2) The Common Core Initiative
- 3) Pros of the Common Core State Standards
- 4) Cons of the Common Core State Standards
- 5) How the Common Core standards are being implemented
- 6) How the Common Core standards are being assessed
- 7) The effects of diversity and demographics on student achievement
- 8) The impact of the implementation of Common Core

Causes of Changes in Educational Standards in Tennessee

For more than a decade, Tennessee schools have been making substantive changes as they endeavor to do what is best for their students. In February of 2007, Tennessee received an "F" from the United States Chamber of Commerce. According to Score (2013), the rating was received for Truth in Advertising About Student Proficiency and Postsecondary and Workforce Readiness. The State needed to make the changes

necessary to increase the effectiveness of education. According to Score (2013), in June, Tennessee began working to align K-12 education standards with the skills and knowledge necessary for success in college and career. This was through what was called the Tennessee Diploma Project as Tennessee joined thirty other states as part of the American Diploma Project Network. Over the next several months, the Tennessee State Board of Education adopted the new standards.

By the end of 2008, the common core initiative had launched and during the following year, Tennessee made the crucial decision to join the initiative. According to Score (2013), by March of 2010, a draft of the Common Core State Standards was released for feedback and by the beginning of the summer, the final version of the Standards were released and the Validation Committee reported that the Common Core State Standards were based on well recognized best practices in all the areas covered by the Common Core Initiative. The Common Core Initiative was a product of standards that were appropriate for both the national and international education, as well as research and input from numerous sources. In July of 2010, the Tennessee State Board of Education voted to adopt the standards. The vote was unanimous.

At the start of the 2011 school year, Tennessee schools began implementing the Common Core State Standards for kindergarten through second grade. Score (2013), noted that more than 13,000 educators in the State of Tennessee received training on the Common Core Standards in the area of Mathematics during the 2011 - 2012 academic school year, resulting in the additional implementation of the Mathematics standards which occurred by adding grades three through eight and also beginning the language arts

standards. By the end of 2013, the Common Core standards were being fully implemented in the areas of mathematics and Language Arts at all grade levels.

The Common Core Initiative

The Common Core Initiative was first implemented in 2010 in the State of Tennessee. The Common Core Initiative developed by David Coleman maintains proposes that all stakeholders are working together toward shared goals and are in agreement about what is important to be taught and the best methods for teaching to the standards. With open lines of communication, educators will be able to collaborate to best meet the needs of their students and help them grow and develop to their maximum abilities. With this method, more individualized benchmarks can be developed and utilized in the quest to better assess student work and to test their achievement level. As noted by the Common Core State Initiative (n.d.), Common Core focuses on foundations of conceptual understanding. Teachers focus on spending more time teaching procedures in ways needed for comprehension. Having more time to focus on key elements allows students the opportunity to master concepts according to skill level.

The Common Core State Standards Initiative (n.d.) reveals that the set of standards are:

- (1) Research-based and evidence based;
- (2) Clear, understandable, and consistent;
- (3) Aligned with college and career expectations;
- (4) Based on rigorous content and the application of knowledge through higher-order thinking skills;
- (5) Built upon the strengths and lessons of current state standards;

(6) Incorporated by other top-performing countries to prepare all students for success in our global economy and society. (p. 2)

Starting in the early grades, the standards are primarily focused on the core concepts and procedures. This gives teachers the time needed to teach them the way they need to be taught and gives students the time needed to master those skills. According to the Common Core State Standard Initiative (n.d.), the standards draw from the most important international models. Additionally, research and input from numerous sources, which includes educators from kindergarten through college were used in the development and refinement of the Common Core Standards. State departments of education, scholars, assessment developers, professional organizations, parents and students, and members of the public were also involved in the development of the Common Core Standards.

There were several rounds of feedback that was solicited during the development of the standards to ensure that proper stakeholder involvement had taken place. The National Education Association (n.d.) indicated that during the first round of drafting for the Common Core State Standards in Mathematics and Language Arts, the Common Core State Standards staff met with NEA members who were National Board Certified Teachers. Staff members listened attentively to NEA members and made substantive changes in the standards based on the recommendations of the NEA teachers, as well as, those opinions and recommendations of teachers from other educational and teacher rights, labor organizations and professional organizations including the American Federation of Teachers, the International Reading Association, the National Council of

Teachers of English, and the National Council of Teachers of Mathematics according to the National Education Association (n.d.).

Kindergarten through eighth grade students have grade-by-grade standards in English Language Arts/Literacy and Mathematics. However, for grades nine through twelve, the standards are grouped into grade bands of nine to tenth grade standards and eleven to twelfth grade standards. The standards do not define how they should be taught or which materials should be used to support the students. The National Education Association (n.d.) believes that their work on Common Core Standards has established the platform to provide teachers with far more manageable curriculum goals and the opportunity to use their expertise to meet the needs of their students.

Pros of Common Core State Standards

Like most things in education, the set of new Common Core Standards has several pros as well as cons associated with them. Meador (n.d.) discusses several pros and cons concerning the Common Core Standards, starting with the fact that they are internationally benchmarked. This allows the United States to compare favorably to other countries. The new testing will also allow states to compare the data with a higher level of accuracy. Having common standards and assessments makes the playing field level. Meador (n.d.) also proposes that the development cost for assessments, scoring and reporting will decrease due to the unity that comes with the Common Core State Standards.

The rigor and relevance are also said to increase according to Meador (n.d.). Students will develop higher-order thinking skills, which will better prepare every student for college and, ultimately, the workforce. The assessment of the abilities and skills

required of will take place throughout the year and be more authentic to the student's learning. Students will know what is expected of them and be able to excel. Teachers will be able to engage in collaboration more than they are currently able to be involved in as a result of the implementation of the Common Core Initiative across the nation.

Cons of the Common Core State Standards

Although the Common Core State Standards have several positive aspects associated with them, they likewise have a number of negative aspects associated with their implementation which must be considered when making a fair assessment of the program. The original adjustment to the new Common Core Standards will be difficult according to Meador (n.d.). The transition from traditional standards-based education initiatives to the Common Core Initiative will be incredibly difficult because teachers and students both are not accustomed to the new methods and strategies associated with the initiative. The difficulties with the transition alone could be the catalyst that motivates teachers and administrators, who normally excel at what they have been accustomed to teaching and the methods employed to teach in the past, to seek other opportunities for a career either in education where the Common Core Initiative has not been adopted or in a non-education field altogether.

Meador (n.d.) suggests that the Common Core Standards themselves are a bit too broad. Without being specific, it is difficult to gauge if the implementation process is being adequately adopted, implemented, evaluated, and refined to insure program success. Additionally, students are expected to learn more quickly using the Common Core Initiative Standards and learning strategies than ever before. Rigor is at an all-time high and the expectation for higher-order thinking is extremely keen also. These new

expectations will not be modified for those students with special needs. All students will be held to the same level and the same testing standards. This is also a problem because standardized testing data will become even more relevant. A larger value will be placed on the data because of the testing. However, there are no tests currently for Science or Social Studies; therefore, the various states will have the responsibility for the creation and development of the tests in those two core areas.

The Common Core State Standards could actually be less rigorous in some circumstances where states have adopted even more difficult standards. Meador (n.d.) shares that the Common Core State Standards were created for the middle ground which in essence, has create a test that is an average of the current standards. Textbooks will also become an issue because they will not match the teaching methodology emphasized in the new set of standards. This will cost districts an enormous amount of money to replace the textbooks and all the peripheral teaching materials as well as purchasing the necessary online codes and access fees associated with the new e-learning textbook systems. The assessments, like the Partnership for Assessment of Readiness for College and Careers (PARCC) require students to take the test online. Therefore, districts will need to be sure that they have the needed technology to implement testing for all students equally. The equitable administration of the test is essential but the preliminary training of all students equitably in the use of the necessary technologies to take the test is likewise an essential aspect that schools will need to be cognizant of and be prepared to bear the burden of the cost associated with the requirement. Students cannot take an online test using technology with which they have little or no familiarity with. American

schools are increasingly dropping classes dedicated to teaching students in the use of computers and other technology.

How the Common Core Standards are Being Implemented

Today's education system is struggling due to the intersection of two major reform strands, according to Leibbrand (2014). The first reform strand is the introduction of the rigorous Common Core State Standards, which brings new expectations for both student and teacher performance. The new Common Core Standards and the accompanying assessments will be administered to students simultaneously. Therefore administrators will be required and to hold teachers accountable based on the assessment results more than ever before and their compliance will not and should not be an option.

The Partnership for Assessment of Readiness for College and Careers (PARCC) established clear action steps for states and districts for the implementation of Common Core State Standards. PARCC (n.d.) noted that the workbook provides relevant information, case stories of good practice, and key questions and hands-on exercises for leadership teams to complete together. No matter what the state's timeline looks like, the workbook offers state and district leaders a plan for the successful implementation of the Common Core State Standards.

The workbook supplied by PARCC (2012) supplies a guideline for implementation starting with an assessment of the schools themselves to find out how ready they are for the implementation. Schools need to determine the system's current capacity to deliver the new standards. The implementation of the new Common Core State Standards will require a very clear understanding on the part of all the individuals in

the organization as well as the other key organizational partners who will play vital roles in the process.

The aspiration is the most powerful tool in the implementation process. It signifies a shared understanding of what success looks like. PARCC (2012) describes that it must be clear, measurable and understandable to everyone. With respect to the Common Core State Standards, this aspiration is directly related to the impact expected as a result of the implementation of the new set of standards by the end of the 2014 – 2015 school years. The outcome of this process will help the system to develop an appropriate timeline for implementation of the Common Core State Standards.

According to the Tennessee Core (2012), Tennessee has chosen to be a part of the implementation of the Common Core Standards. The state started the implementation in 2011-2012 by fully introducing Mathematics and English Language Arts in kindergarten through second grade. During the 2012-2013 school years, schools were partially beginning the initiative in Mathematics for the grade levels three through eighth. During the 2013-2014 school years, many grade levels were affected by the implementation of the new Common Core Standards. Grades third through eighth were implementing the Mathematics and English Language Arts standards fully as well as in grades nine through twelve. Therefore, by the end of the 2013-2014 school year, grades kindergarten through twelve were fully implementing the Common Core Standards in Mathematics and English Language Arts. Additionally, grades six through twelve began implementing literacy for Social Studies, Mathematics and Science during the school 2013 – 2014 school year.

The new Common Core Standards require considerably more from students than the traditional standards which schools have adopted throughout the previous decades in response to similar eras calling for teacher and student accountability. There are not as many standards to master with the Common Core Initiative, but the remaining standards have some significantly higher expectations associated with them than in decades past. The new Common Core Standards require high-level analysis, synthesis, and problem-solving. As pointed out by Leibbrand (2014), these higher-level skills take time to develop, and they develop only with the help of good teachers.

The current state assessments do not align with the new standards. The State of Tennessee has made plans to replace the Tennessee Comprehensive Assessment Program (TCAP) with the PARCC test. However, the TCAP is currently being administered in the state of Tennessee. This leaves Tennessee and states like it in a rather precarious situation. Accountability becomes difficult when you are teaching using one set of standards and testing based on another set of different standards, according to Leibbrand (2014). States that are currently receiving federal Race to the Top grants had previously agreed to reform their teacher-evaluation systems to link teacher performance to student performance directly. Other states, as well as Tennessee, have established a teacher evaluation system that uses a rather large percentage of student test score measures as a part of the teacher evaluation; thirty-five to forty percent as is the situation with some states.

Leibbrand (2014) notes that a five-year plan would be a more reasonable means to carry out change in reference to the new common standards and assessments. There are several states that may not have the flexibility others have in their implementation

timelines for accountability provisions because of issues with No Child Left-Behind Act waivers. New York and Maryland have recently received approval to hold off on administering the new assessments for teacher evaluations and principal evaluations.

These states are using implementation groups that are made up of highly qualified individuals such as teachers of the year, and district personnel with strengths in the area of instructional leadership. The members of these groups would be the ones to train and support teachers and principals statewide so that all educators receive equal training as revealed by Leibbrand (2012). Student progress should be monitored yearly and changes should be made to the implementation as needed and training be provided in areas of weakness.

How the Common Core standards are Being Assessed

For Tennessee, students have become accustomed to the Tennessee Comprehensive Assessment Program (TCAP). TCAP is a set of state-wide assessments developed and implemented in Tennessee schools to measure students' skills and progress according to the Tennessee Department of Education (2014). The achievement test is timed and is a multiple choice assessment. The assessment measures skills in Reading, Language Arts, Mathematics, Science and Social Studies.

Student achievement has shown gains in recent years across the state in several areas. The Tennessee Department of Education (n.d.) noted that following the implementation of Race to the Top, Tennessee has seen three consecutive years of overall growth on the TCAP. Almost 91,000 additional students are at or above grade level in all Mathematics subjects when compared to 2010. Of the 91,000 that have demonstrated

significant improvement, 73,400 represent growth in 3-8 mathematics as shown by the Tennessee Department of Education (n.d.).

Reeves (2004) indicated that reviews of accountability data from hundreds of schools reveal the schools with the greatest gains in achievement consistently employ common assessments. Assessments are of highest importance when it comes to the collection and analyzing of data and are said to be a “best practice”. In previous years, states, like Tennessee, have maintained their own methods of assessment. With the implementation of Common Core comes the implementation of common assessments across states, such as the PARCC and Smarter Balanced.

Kantrowitz (2013), shares that many teachers and administrators are already concerned about how to negotiate differences between the old and new standards in regards to testing. With the implementation of Common Core, elementary schools must transition to the PARCC testing. Many educators have embraced the Common Core standards, while others worry that their impact will not be clear until 2015 or later. According to Kantrowitz (2013) that is because this school year, schools will still use the TCAP whose tests weren't designed to reflect material in the Common Core.

In future years the state will use the PARCC testing. Tennessee was an active member of the development process for the PARCC. State education officials would say the state has been involved in the test's design since the beginning. PARCC will replace TCAP in math, reading and writing for grades 3-11 as described by Kantrowitz (2013). Because the state was so involved in the development process, implementing the PARCC testing should be a smooth transition in regard to curriculum. The PARCC tests in math

and English are designed to assess more critical thinking, and a deeper understanding of math concepts while ensuring a greater use of evidence by students in their writing.

Even though Tennessee was a part of the development process for the PARCC testing, the state is not free from obstacles when it comes to implementation. As Kantrowitz (2013) points out, one of the largest obstacles in switching to the PARCC test has been the fact that it will be administered online. This would mean that every school must have enough computers for use by all students. Funding is needed to make sure that this is achieved, which is a sore subject area for many states. The current cost of administering tests varies widely among states, but the new tests will cost from \$22.50 to \$29.50 per student according to Kantrowitz (2013). PARCC test will cost the state \$21-25 million, which is an increase compared to an estimated \$20 million that TCAP would cost.

Hacker (2013) suggests that as for the rest of those implementing the new testing during this school year, these students in grades 3 through 8, are taking part in what may be called the most far-reaching experiment in American educational history. These students answered questions requiring them to analyze both fiction and nonfiction, with multiple-choice answers and short essays. Additionally, the mathematics part of the testing included complex equations and word problems which may not have been included in students' classroom curriculums as described by Hacker (2013).

The Effects of Diversity and Demographics on Student Achievement

Many studies have been conducted to discover a correlation between gender and academic achievement. According to Zembar (2011), the majority of studies show that girls are higher achievers than boys on average. Girls and boys have very similar rates of

intelligence, however, girls work harder as noted by Flannery (2013). Their hard work pays off in regards to better grades and overall achievement. Flannery (2013) shared that in 2010 the college completion rate for men was just 27 percent which has not changed much in the past 40 years. Women are another story, rising up to a 36 percent completion rate, up from 14 percent in 1970.

The Department for Children, Schools, and Families (2009) suggested that after an analysis of data, there are other factors or a combination of factors that have a greater bearing on educational achievement than gender. These other factors include ethnicity and social class. The National Center for Education Statistics (2011) points out that white students had higher scores than Black students on all assessments in grades 4 through 8. This was true on average for all assessments. The data used was from public schools and focused solely on grades 4 and 8 in the areas of mathematics and reading. Additionally, according to studies from The National Center for Education Statistics (2011), since the early 1990s, the Hispanic-White achievement gap for public school students has not narrowed either. This is true on the national and state levels.

Transiency is another issue that faces education. As Smith (2011) shared, transiency is where a person (transient) or family only lives or works in one place for a short time. With about 3 million children being born each year, up to 40 million Americans move during that same time period. This makes mobility far more important than births in explaining population changes according to Hodgkinson (2001). Schools face challenges as a result of transiency. This issue can cause poor attendance and drop out rates in schools anywhere. Lack of parent and community involvement is also

problematic. Smith (2011) shared that in many cases these factors affect total school performance on achieving AYP (Annual Yearly Progress) standards.

The Impact of the Implementation of Common Core

Initially, the case for the Common Core was a relatively solid proposal with most educators and educational specialists. Hacker (2013) noted that it is widely known that American students tend to score well below their European and Asian counterparts. This is especially true in the areas of Reading and Mathematics, which is alarming considering that we are living in an extremely competitive era. In 2009, the Program for International Student Assessment ranked the United States twenty-fourth out of the thirty-four countries examined in Mathematics Literacy. The United States trailed both Sweden and the Czech Republic in the area of Mathematics Literacy. The United States ranked eleventh among the same group trailing Estonia and Poland, according to Hacker (2013). Surprisingly, South Korea ranked first in both Mathematics Literacy and Reading Literacy, according to Hacker (2013). Hacker (2013) claims that under the Common Core Initiative, students participating in the implementation of the Common Core Standards will immediately face significantly more demanding practice and rigor in every area included in the Common Core Initiative. Supporters have confidence that the nation's students will rise to these challenges and make up for our country's lag in the global education race.

According to Burbeck (2014), the State Superintendent for South Carolina, Dr. June Atkinson, is fighting back against a proposal to eliminate the Common Core State Standards Initiative from her state and nationally. Atkinson says that those who push to replace Common Core are more focused on politics than education and believes some

people who oppose it haven't read it. Atkinson believes that for her district, the Common Core Initiative works and is a means of stability for students and teachers. Atkinson's students struggle like many, in the areas of Mathematics and Language Arts/Literacy. Atkinson maintains her position that the Common Core standards are challenging. As noted by Burbeck (2014), the Common Core Standards will better prepare students for college, universities as well as the workplace.

However, parents feel that there are some issues that need to be resolved concerning Common Core, especially in the areas of testing and accountability. Burbeck (2014) shared that teachers do not want to change back to the traditional standards and the accompanying curriculum, not to mention the disjointed assessments that have been used in the past. Teachers believe that Common Core is working and that it would be incredibly frustrating to be asked to change the process yet again. Plenty of professional development and planning, accompanied by teacher and team planning along with administrative consultation has taken place with the new implementation that would be wasted if the state backed out of the process. Teachers see the students being forced to engage in deeper thinking through the increased use of higher-order thinking requirements and also in regards to decision-making and reasoning. This challenges the students to work harder and to focus more on reaching their fullest potential. The proof of the degree of success of the Common Core Standards will lie in the testing results within the districts and throughout the state, not just in Tennessee, but across the entire country.

Students in the State of Tennessee and Kentucky were among the first to undergo the Common Core's rigorous testing regimen. Tennessee, like Kentucky, adopted the

standards in 2010. The following year, test scores in Reading and Mathematics had dropped by one-third. According to Hacker (2013), one should not completely blame the students, or the teachers for the decrease in scores. Teachers struggle to teach to the new, overwhelming test that, in some cases, extends the parameters of their curriculums.

Parents, teachers and students are finding ways to blame the Common Core for their shortcomings. There is confusion about what the Common Core actually is and what it is intended to accomplish. As revealed by Lahey (2014), the Common Core is a set of standards that lists the various competencies and skills that students will need to master by the end of a given school year. The standards themselves require specific skills that will be taught and prescribes the manner in which the teaching process must occur. However, the curriculum dictates other details such as how a given skill is conveyed. Therefore, the Common Core is not the largest issue in the acceptance issue. However, the real issues arise as a result of the manner in which the information is being conveyed to teachers, administrators, schools, and to students, not to mention the stakeholders which include the parents.

According to Lahey (2014), journalists, teachers, and parents should maintain some restraint. Lahey also points out that in order to defeat the enormous problems that plague education, we need to divide and conquer. So many problems can conjure emotions of anger when it comes to education, simply because kids are involved and parents, as well as teachers, become extremely emotional and protective when children are at the heart of any issue. However, school choice, poverty, overcrowded classrooms, and state-mandated standardized testing were threats long before the Common Core State

Standards arrived, according to Lahey (2014). Frustration should be targeted in the right direction by blaming those responsible such as the states, districts, and schools.

Many states are unhappy with the changes made by implementing the Common Core Standards. Strauss (2013) noted that states are withdrawing from the implementation of Common Core and in many cases, are even hesitant to even give marginal consideration to the implementation and are either threatening to withdraw completely from the process or withdraw conditionally. They want changes to the Common Core Standards and the implementation process specifically. As of 2013, Alabama, South Dakota and Georgia are a few of the states in this category. According to Vander Hart (2014), Utah, Oklahoma, Indiana, Kansas, Pennsylvania, Alaska and Florida have also chosen to pull out of Common Core assessments. Educators are increasingly vocal in their concerns about the Common Core Initiative. This is due in large part to the fact or perception that states have done a poor job implementing the Common Core Standards. As indicated by Strauss (2013), teachers feel that core-aligned tests are being required for students much too early in their educational journey. Similar concerns by a number of parents has caused them to choose an opt-out approach to the issue of the high-stakes accountability testing of their children.

Parents are aligning themselves in opposition to the Common Core Standards as well as the schools in a variety of ways. According to Brown (2014), opponents of the Common Core assessments propose that as many as 70% the students in public schools in New York State backed out from taking the Language Arts exams during the 2013-2014 school year. Schools, educators, and parents claim that the testing is too stressful for the students. They are also extremely concerned that the Common Core Initiative is

jeopardizing the time needed in key classes and activities. Elementary school students need activity and enrichment classes such as gym, music and art and are being systematically required to forfeit their time in these subjects to allow time to prepare for the tests that accompany the Common Core Initiative. New York City parents were amazed and stunned to witness that their children's test scores had plummeted, as revealed by Brown (2014). Less than one third of the students tested in New York City schools were able to manage a passing grade in either Reading or Mathematics.

Simon (2014), suggested that 70% of teachers believe that the implementation of the Common Core Standards is ineffective within their schools. According to Brown (2014), during the 2013-2014 school year, teachers in New York City complained that they had not been fully trained in the appropriate teaching procedures for the new Common Core Standards. Additionally, many did not receive textbooks and teaching materials for the exams until well into the school year. Teachers also felt that the new curriculum was fraught with errors. Simon (2014) also shared that the nation's largest teachers union, National Education Association, has started to withdraw support for the Common Core Standards, the Common Core Initiative, and the testing protocols associated with the Common Core Initiative. Even though they were enthusiastic about the roll-out in the beginning, the implementation has been witnessing some significantly troubling gaps. Dennis Van Roekel, the President of the NEA, still believes that the standards can improve student achievement. However, they will not succeed without major changes to the curriculum as well as the testing protocols. The changes must follow extensive feedback from the teachers as well all the stakeholders which is

strongly supported and promoted by numerous education specialists, including Simon (2014).

According to Strauss (2013), the process for creating the new K-12 standards did not involve enough research, public opinion, or input from the key stakeholders, teachers. The makeup of the committee that created the Common Core Standards consisted of 135 people, none of whom were teachers in the grade levels that the standards would impact. The problems and concerns arise from the fact that the Common Core Committee membership was constituted without the benefit of including teachers or administrators with a background in the levels of education and learning affected by the Common Core Standards and the assessments that accompanied the standards. Strauss (2013) claimed that those who vocally serve as promoters of the Common Core Standards Initiative who base their beliefs and support for the standards in the perception that the standards are based in research are wrong. No convincing research exists that reflect developmental science and cognitive learning as a result of the Common Core standards.

Noonan (2014) maintains that the Common Core proponents were in love with the idea of the initiative yet gave little thought to the actual implementation of the standards. These rigorous and unrealistic standards establish higher expectations raising the bar as to what children can be expected to have learned by the time they leave the public schools without a plan to get them there. According to Noonan (2014), the assessments involve questions that have come out nonsensical and impenetrable. These questions promise to go downhill and become demoralizing to the students, teachers and the entire educational endeavor.

Testing for the Common Core does not match the whole emphasis of the Common Core Initiative, according to Strauss (2014). As the Common Core State Standards are being implemented in most states and the District of Columbia, new tests that will be aligned are being designed for students to start taking during the 2014-2015 school year. Currently, millions of students around the country are participating in field tests on these exams. In most circumstances, the questions are a lot more difficult for students than those on previous standardized tests administered for accountability purposes.

Singer (2014) proposed and offered considerable dialogue regarding the perception that the State Department in New York has finally come to the conclusion that they need to consult teachers about what should be taught and, as a result, are interested in the establishment of a Common Core Institute. Apparently Ken Wagner, the Deputy Commissioner for Curriculum, Assessment and Education Technology has suggested that New York State is looking to determine if the Common Core Standards and the Common Core Assessments are beneficial for their students in determining academic growth in the areas the Common Core Standards cover. Singer (2014) maintains that it would have been a reasonable expectation for the Common Core Initiative and the State of New York to have studied the standards, the process and procedures and the assessments to have determined if the Common Core Initiative was a model that actually worked before subjecting students to rounds and rounds of high-stakes testing.

The testing itself is suspect and should be scrutinized and thoroughly questioned before subjecting students anywhere to this arduous process. A major concern and something that should call into question the entire assessment piece of the program is the

fact that members from the development team were from the testing industry and were light-years from being actual teachers. According to Singer (2014), only one of the teachers involved in the original writing team for the Mathematics testing was an actual Mathematics teacher. Additionally, of the fifteen members of the English/Language Arts team, only five had secondary school classroom teaching experience. Additionally, not a single member of the assessment team had ever taught in the elementary school.

Likewise, none of them had any experience teaching children with special needs and none of them had ever taught English Language Learners or had been associated with teaching students in an environment that had a population of English Language Learners.

Strauss (2014) shares that “cut scores” are set for various tests establishing the difference between who passes and who fails. This is true of the Common Core testing. The assessment will have a cut score or point value which has been selected on the score scale of a test. The points are used to determine whether a particular test score is sufficient for some purpose. These cut scores are selected based on criteria that are determined to have importance. Unfortunately, many times the criteria have no real validity in revealing student achievement. This would cause the scores to have little or no significant meaning either. If teachers are being evaluated on test scores, this raises a red flag.

The transition to Common Core appears to be extremely expensive. The cost of changing and implementing the Common Core initiative has many school districts in a bind. Even before the initiative became a reality, states were struggling financially. Chiaramonte (2014) shares that states are learning that the cost of Common Core is incredibly high. At the outset of the Common Core Initiative, it was estimated that as

many as forty-five states were anxiously awaiting the opportunity to participate in the program. However, according to Chiaramonte (2014), it currently appears that several states are reconsidering their participation due to the high costs, which include 10 billion dollars to merely launch the program. Additionally, during the first seven years, states can spend upwards of 800 million dollars on textbooks, curriculum, teacher training, technology and assessment.

Student achievement needs to be the focus of all decision-making within schools. Research and data analysis should be used when making such drastic changes within a school or state. Lewis (n.d) reveals that information speaks volumes in the education world. Data analysis can provide a clear snapshot of what students know, should know, and what can be done to meet all of their academic needs. When the appropriate analyses and interpretation of data are achieved, educators can make informed decisions that have a positive impact student achievement.

Looking at and analyzing the data for student achievement can lend validity to the success that can be achieved from the implementation of the Common Core Initiative. Data can also be used to determine areas of weakness and where professional development could strengthen the implementation. States can then accurately determine what is best for them individually when it comes to their individual financial circumstances and the implementation of the Common Core Initiative and its success for their students.

schools with varying demographics. Anonymity of participants was guaranteed by not revealing any participant names on surveys or markings to identify the respondents. Confidentiality for all participants was maintained through the use of archival data without any identifiers that could remotely be used to connect to any students. The archival data were collected and tabulated by a system administrator assigned the responsibility for data management and was then given to the researcher as raw scores without any identifiers that could be in any way linked to a specific student or groups of students.

Data Collection Procedure

A letter was sent to the Austin Peay State University (APSU) Institutional Review Board (IRB) requesting permission to complete this field study and was approved by the IRB. Additionally, a letter was also sent to the Director of Schools of the Dickson County School System requesting permission to conduct this field study in the school system. These letters provide a brief overview of the field study, an explanation of the minimal risks involved, and to ensure that the School System's request to participate in the study were granted and then have access to the findings of the study at the conclusion of the writing of the Field Study.

After approval was obtained from the APSU Institutional Review Board and the Director of Schools for the Dickson County School District to conduct research using Archival Data, data was retrieved from TCAP scores from the Dickson County Office of Student Services and the Tennessee Department of Education Report Card. The data was collected for the 2011-2014 school years. Results from the study were collected and

shared with the participants upon their request for the data. All data were taken from public sources and were all available for public review.

Data Analysis Plan

The data was analyzed to determine if students who have been taught using the new Common Core Standards score differently on the TCAP test after the implementation of the Common Core curriculum and assessments. For this reason a one-way Analysis of Variance (ANOVA) was utilized to compare multiple samples. Those compared were third through fifth graders before the implementation of the Common Core curriculum and third through fifth graders after the implementation of the Common Core curriculum and assessments in the areas of Mathematics, Reading, Science, and Social Studies. The one-way analysis of variance (ANOVA) was performed to compare the Normal Curve Equivalency (NCE) scores by grade level for the school years 2011, 2012, 2013, and 2014 in the areas of Mathematics, Reading, Science and Social Studies. The Statistical Package for the Social Sciences (SPSS) was utilized for all statistical analyses. Hypotheses were tested for statistical significance at the $p < .05$ level to indicate whether there is a statistically significant difference between TCAP scores before and after the introduction of the Common Core Initiative within the Dickson County School System.

CHAPTER IV

RESULTS

Introduction

The relationship is not known regarding student achievement and the implementation of the Common Core State Standards. For that reason, this field study was undertaken to study the relationship between academic achievement and the implementation of the Common Core State Standards for the eight elementary schools in the Dickson County School System. The purpose of the study was to determine if a significant relationship existed between the implementation of the Common Core State Standards and student achievement. This chapter presents the results of the data analysis while also addressing the following research questions:

1. Is there a significant difference in the academic performance of third graders on the TCAP in the areas of Mathematics, Reading, Science, and Social Studies after the implementation of the Common Core Standards?
2. Is there a significant difference in the academic performance of fourth graders on the TCAP in the areas of Mathematics, Reading, Science, and Social Studies after the implementation of the Common Core Standards?
3. Is there a significant difference in the academic performance of fifth graders on the TCAP in the areas of Mathematics, Reading, Science, and Social Studies after the implementation of the Common Core Standards?

This chapter will also address the data analysis procedures, and the results for each research question as well as the corresponding Null Hypothesis addressed in the field study.

Data Analysis Procedures

The study used TCAP Normal Curve Equivalency (NCE) scores in the areas of Mathematics, Reading, Science, and Social Studies to measure achievement over the years of 2011 through 2014. A sample size of 597 students was used to represent all eight elementary schools.

Using SPSS advanced statistical analysis, TCAP Mathematics, Reading, Science and Social Studies NCE scores prior to the implementation of Common Core in 2010-2011 were compared to TCAP Mathematics, Reading, Science and Social Studies NCE scores during the years of 2011-2014 during which time the Common Core curriculum and the corresponding assessments had begun being implemented. TCAP Mathematics, Reading, Science and Social Studies Normal Curve Equivalency (NCE) scores from 2010-2011 served to establish the baseline for subsequent years and scores that were received after the implementation in 2011-2014 served as the comparison years. Using descriptive statistics, three different hypotheses were researched. Scores were compared for each grade level in the grades three through five. Each hypothesis was tested using the repeated measures analysis of variance (ANOVA). The grade levels were analyzed by subject over the span of four years, 2011 – 2014.

Presentation and Analysis of Data

This section of the chapter provides the data analysis for each of the three research questions.

Research Question One

Is there a significant difference in the academic performance of third graders on the TCAP after the implementation of the Common Core Standards?

Null Hypothesis One

There will be no statistically significant difference in the academic performance of third graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Mathematics after the implementation of the Common Core Standards.

Table 1

One-Way Repeated Measures Analysis of Variance (ANOVA) comparison of TCAP NCE scores for third graders for the years of 2011 – 2014 in Mathematics, Reading, Science, and Social Studies

Content	N	M 2011	M2014	MD	<i>p</i>
Mathematics	597	85.50	84.71	-.79	.255
Reading	597	84.69	82.18	-2.51	.000
Science	597	86.58	85.52	-1.06	.094
Social Studies	597	91.32	89.91	-1.41	.000

Note: $p < .05$, two-tailed; MD = Mean Difference

Table 1 illustrates the use of descriptive statistics; a One-Way Repeated Measures Analysis of Variance (ANOVA) was used to compare third grade students TCAP NCE scores in the areas of Mathematics, Reading, Science and Social Studies before and after the implementation of the Common Core State Standards.

The *p*-value of .255 for the One-Way Repeated Measures Analysis of Variance (ANOVA) test comparing Mathematics scores and a Mean Difference of -.79 clearly indicated that there was not a statistically significant difference between the Mathematics

scores for the students tested prior to the implementation of Common Core Assessments and the Mathematics scores for the students who participated in the Common Core curriculum and the accompanying assessment in Mathematics. Therefore, null hypothesis one was retained. (See Tables 1 and 2)

Table 2

One-Way Repeated Measures Analysis of Variance (ANOVA) comparison of TCAP NCE scores for third graders for the years of 2011 – 2014 in Mathematics

Content	N	M 2011	M2014	MD	<i>p</i>
Mathematics	597	85.50	84.71	-.79	.255

Note: $p < .05$, two-tailed; MD = Mean Difference

Null Hypothesis Two

There will be no statistically significant difference in the academic performance of third graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Reading after the implementation of the Common Core Standards.

The *p*-value of .000 for the One-Way Repeated Measures Analysis of Variance (ANOVA) test comparing Reading scores and a Mean Difference of -.2.51 clearly indicated that there was a statistically significant difference between the Reading scores for the students tested prior to the implementation of Common Core Assessments and the Reading scores for the students who participated in the Common Core curriculum and the

accompanying assessment in Reading. Therefore, null hypothesis two was rejected. (See Tables 1 and 3)

Table 3

One-Way Repeated Measures Analysis of Variance (ANOVA) comparison of TCAP NCE scores for third graders for the years of 2011 – 2014 in Reading

Content	N	M 2011	M2014	MD	<i>p</i>
Reading	597	84.69	82.18	-2.51	.000

Note: $p < .05$, two-tailed; MD = Mean Difference

Null Hypothesis Three

There will be no statistically significant difference in the academic performance of third graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Science after the implementation of the Common Core Standards.

Table 4

One-Way Repeated Measures Analysis of Variance (ANOVA) comparison of TCAP NCE scores for third graders for the years of 2011 – 2014 in Science

Content	N	M 2011	M2014	MD	<i>p</i>
Science	597	86.58	85.52	-1.06	.094

Note: $p < .05$, two-tailed; MD = Mean Difference

The p -value of .094 for the One-Way Repeated Measures Analysis of Variance (ANOVA) test comparing Science scores and a Mean Difference of -1.06 clearly indicated that there was no statistically significant difference between the Science scores for the students tested prior to the implementation of Common Core Assessments and the Science scores for the students who participated in the Common Core curriculum and the accompanying assessment in Science. Therefore, null hypothesis three was retained. (See Tables 1 and 4)

Null Hypothesis Four

There will be no statistically significant difference in the academic performance of third graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Social Studies after the implementation of the Common Core Standards.

Table 5

One-Way Repeated Measures Analysis of Variance (ANOVA) comparison of TCAP NCE scores for third graders for the years of 2011 – 2014 in Social Studies

Content	N	M 2011	M2014	MD	p
Social Studies	597	91.32	89.91	-1.41	.000

Note: $p < .05$, two-tailed; MD = Mean Difference

The p -value of .000 for the One-Way Repeated Measures Analysis of Variance (ANOVA) test comparing Social Studies scores and a Mean Difference of -1.41 clearly

indicated that there was a statistically significant difference between the Social Studies scores for the students tested prior to the implementation of Common Core Assessments and the Social Studies scores for the students who participated in the Common Core curriculum and the accompanying assessment in Social Studies. Therefore, null hypothesis four was rejected. (See Tables 1 and 5)

Table 6

One-Way Analysis of Variance (ANOVA) Pairwise comparisons of TCAP Normal Curve Equivalency (NCE) scores for third graders in Mathematics, Reading, Science, and Social Studies for School Years 2011 through 2014

YS	YE	Mathematics		Reading		Science		Social Studies	
		MD	<i>p</i>	MD	<i>p</i>	MD	<i>p</i>	MD	<i>p</i>
2011	2012	-.251	1.000	-.585	.026	.079	1.000	.769	.000
	2013	-.827	.906	-.864	.655	-1.332	.166	-.419	1.000
	2014	-.787	.871	-2.514	.000	-1.065	.467	-1.410	.023
2012	2013	-.576	1.000	-.280	1.000	-1.410	.127	-1.188	.041
	2014	-.536	1.000	-1.930	.004	-1.144	.354	-2.179	.000
2013	2014	-.040	1.000	-1.650	.042	.266	1.000	-.992	.138

Note: $p < .05$, two-tailed; YS = Year Start, YE = Year End, MD = Mean Difference

Table 6 shows the Pairwise comparisons for the Tennessee Comprehensive Assessment Program (TCAP) Normal Curve Equivalency (NCE) scores for third graders over the years 2011 – 2014. The table provides data that gives the researcher a number of things to consider. The mean differences are negative across, not only school years, but also across the various disciplines. Additionally, the analysis indicated that in Reading, a

significant difference existed when comparing to the scores in the years of 2011-2012, and also each year compared with the 2014 scores. These years did not show statistically significant gains in student test scores. However, in relation to Social Studies scores, the data indicated that statistically significant differences in student test scores occurred between some school years and the opposite during other school years comparisons, as is illustrated in Table 6. For the 2011-2012 school year, Social Studies data did reflect a statistically significant difference when comparing the student data before Common Core assessments to the student data from after the implementation of Common Core assessments. However, according to the data, when comparing the school years of 2011-2014, 2012-2013, and 2012-2014, Social Studies shows statistically significant losses. Science is the only subject area that shows a positive mean difference in the most recent years after the implementation of Common Core.

Table 7

Comparison of TCAP Normal Curve Equivalency Means by Subject and Gender for third graders in Mathematics, Reading, Science, and Social Studies for School Years 2011 through 2014

Year	Mathematics		Reading		Science		Social Studies	
	M	F	M	F	M	F	M	F
2011	85.35	85.66	84.16	85.27	87.60	85.46	91.68	90.93
2012	85.48	84.99	83.47	84.80	87.57	85.72	92.62	91.51
2013	84.45	84.48	81.93	84.84	85.40	84.57	90.86	90.96
2014	84.51	84.94	80.88	83.21	85.11	85.35	90.02	89.97

Note: F = Female, M = Male

Table 7 compares the scores in Mathematics, Reading, Science, and Social Studies for school year 2011 through school year ending 2014 by gender. The Mathematics Mean score comparison shows that the only school year that males did better than females was in 2012. Reading Mean scores indicated that males had lower scores in all years when compared to females. According to table 7, the only school year that females had higher Mean scores than males in Science was in 2014. Also, in the area of Social Studies, males had higher Mean scores in all years except 2013. In general, females and males in the third grade scored lowest in the area of Reading and their highest Mean scores were in the area of Social Studies. Females had higher Mean scores in Mathematics and Reading while males had higher Mean scores in Science and Social Studies.

Research Question Two

Is there a significant difference in the academic performance of fourth graders on the TCAP in the areas of Mathematics, Reading, Science, and Social Studies after the implementation of the Common Core Standards?

Null Hypothesis Five

There will be no statistically significant difference in the academic performance of fourth graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Mathematics after the implementation of the Common Core Standards.

Table 8 presents data that reflects the use of descriptive statistics; a One-Way Repeated Measures Analysis of Variance (ANOVA) was used to compare fourth grade

students Tennessee Comprehensive Assessment (TCAP) Normal Curve Equivalency (NCE) scores in the areas of Mathematics, Reading, Science and Social Studies before and after the implementation of the Common Core State Standards.

Table 8

One-Way Repeated Measures Analysis of Variance (ANOVA) comparison of TCAP Normal Curve Equivalency (NCE) scores for fourth graders for the school year of 2011 through school year 2014 in Mathematics, Reading, Science and Social Studies

Content	N	M 2011	M2014	MD	p
Mathematics	597	83.31	80.17	-3.14	.000
Reading	597	85.46	84.03	-1.43	.010
Science	597	87.67	85.40	-2.27	.002
Social Studies	597	88.72	85.82	-2.90	.000

Note: $p < .05$, two-tailed; MD = Mean Difference

Table 9

One-Way Repeated Measures Analysis of Variance (ANOVA) comparison of TCAP Normal Curve Equivalency (NCE) Mathematics scores for fourth graders for the school year of 2011 through school year 2014

Content	N	M 2011	M2014	MD	p
Mathematics	597	83.31	80.17	-3.14	.000

Note: $p < .05$, two-tailed; MD = Mean Difference

The p -value of .000 for the One-Way Repeated Measures Analysis of Variance (ANOVA) test comparing Mathematics scores for fourth graders and a Mean Difference of -3.14 clearly indicated that there was a statistically significant difference between the Mathematics scores for the fourth grade students tested prior to the implementation of Common Core Assessments and the Mathematics scores for the fourth grade students who participated in the Common Core curriculum and the accompanying assessment in Mathematics. Therefore, null hypothesis five was rejected. (See Tables 8 and 9)

Null Hypothesis Six

There will be no statistically significant difference in the academic performance of fourth graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Reading after the implementation of the Common Core Standards.

Table 10

One-Way Repeated Measures Analysis of Variance (ANOVA) comparison of TCAP Normal Curve Equivalency (NCE) Reading scores for fourth graders for the school year of 2011 through school year 2014

Content	N	M 2011	M2014	MD	p
Reading	597	85.46	84.03	-1.43	.010

Note: $p < .05$, two-tailed; MD = Mean Difference

The p -value of .010 for the One-Way Repeated Measures Analysis of Variance (ANOVA) test comparing the Reading scores for fourth graders with a Mean Difference of -1.43 clearly indicated that there was a statistically significant difference between the Reading scores for the fourth grade students tested prior to the implementation of Common Core Assessments and the Reading scores for the fourth grade students who participated in the Common Core curriculum and the accompanying assessment in Reading. Therefore, null hypothesis six was rejected. (See Tables 8 and 10)

Null Hypothesis Seven

There will be no statistically significant difference in the academic performance of fourth graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Science after the implementation of the Common Core Standards.

Table 11

One-Way Repeated Measures Analysis of Variance (ANOVA) comparison of TCAP Normal Curve Equivalency (NCE) Science scores for fourth graders for the school year of 2011 through school year 2014

Content	N	M 2011	M2014	MD	p
Science	597	87.67	85.40	-2.27	.002

Note: $p < .05$, two-tailed; MD = Mean Difference

The p -value of .002 for the One-Way Repeated Measures Analysis of Variance (ANOVA) test comparing the Science scores for fourth graders with a Mean Difference

of -2.27 clearly indicated that there was a statistically significant difference between the Science scores for the fourth grade students tested prior to the implementation of Common Core Assessments and the Science scores for the fourth grade students who participated in the Common Core curriculum and the accompanying assessment in Science. Therefore, null hypothesis seven was rejected. (See Tables 8 and 11)

Null Hypothesis Eight

There will be no statistically significant difference in the academic performance of fourth graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Social Studies after the implementation of the Common Core Standards.

Table 12

One-Way Repeated Measures Analysis of Variance (ANOVA) comparison of TCAP Normal Curve Equivalency (NCE) Social Studies scores for fourth graders for the school year of 2011 through school year 2014

Content	N	M 2011	M2014	MD	p
Social Studies	597	88.72	85.82	-2.90	.000

Note: $p < .05$, two-tailed; MD = Mean Difference

The p -value of .000 for the One-Way Repeated Measures Analysis of Variance (ANOVA) test comparing the Social Studies scores for fourth graders with a Mean Difference of -2.90 clearly indicated that there was a statistically significant difference between the Social Studies scores for the fourth grade students tested prior to the

implementation of Common Core Assessments and the Social Studies scores for the fourth grade students who participated in the Common Core curriculum and the accompanying assessment in Social Studies. Therefore, null hypothesis eight was rejected. (See Tables 8 and 12)

Table 13

One-Way Analysis of Variance (ANOVA) Pairwise comparisons of TCAP Normal Curve Equivalency (NCE) scores for fourth graders in Mathematics, Reading, Science, and Social Studies for School Years 2011 through 2014

YS	YE	Mathematics		Reading		Science		Social Studies	
		MD	<i>p</i>	MD	<i>p</i>	MD	<i>p</i>	MD	<i>p</i>
2011	2012	-1.605	.000	-.442	.205	.072	1.000	.099	1.000
	2013	-.4.707	.000	-1.229	.134	-1.494	.052	-.866	.305
	2014	-3.147	.000	-1.427	.085	-2.270	.002	-2.893	.000
2012	2013	-3.102	.000	-.787	.981	-1.566	.035	-.965	.172
	2014	-1.543	.172	-.985	.634	-2.342	.001	-2.992	.000
2013	2014	1.559	.266	-.198	1.000	-.776	1.000	-2.027	.000

Note: $p < .05$, two-tailed; YS = Year Start, YE = Year End, MD = Mean Difference

Table 13 shows the Pairwise comparisons for the Tennessee Comprehensive Assessment Program (TCAP) Normal Curve Equivalency (NCE) scores for fourth graders in Mathematics, Reading, Science and Social Studies when comparing the data for the school years 2011 – 2014. The Mean Differences data in Table 13 reflects data which generates a number of questions and relationships that should be noted and discussed. The Mean Differences (MD) are negative across, not only school years, but also across the various disciplines. Additionally, the data analysis indicates that in

Mathematics, a statistically significant difference existed when comparing to the student test scores from the 2011 school year in comparison to all subsequent school years. The p-values for these years did indicate a statistically significant difference in student test scores but the Mean Differences for the student test scores for these school years did not reflect any gains, which was also the case for 2012-2013. Additionally, the student test scores in Science indicated that a significant difference occurred as shown in Table 13. For the school years of 2011-2014, 2012-2013 and 2012-2014, student test scores in Science reflects losses when comparing the Mean Differences (MD). Lastly, according to the test data in Table 13, when comparing the school years of 2011 to all subsequent school years, Social Studies shows statistically significant losses as well. Mathematics is the only subject area that reflects student test scores that generated a positive Mean Difference (MD) in the years following the implementation of Common Core.

Table 14

Comparison of TCAP Normal Curve Equivalency Means by Subject and Gender for fourth graders in Mathematics, Reading, Science, and Social Studies for School Years 2011 through 2014

Year	Mathematics		Reading		Science		Social Studies	
	M	F	M	F	M	F	M	F
2011	83.95	82.45	84.72	86.45	88.81	86.42	88.32	88.67
2012	82.15	80.86	84.60	85.61	88.91	86.48	88.86	88.31
2013	78.01	78.98	83.35	85.06	86.45	85.32	87.89	87.73
2014	79.80	79.09	83.31	84.69	86.15	84.64	85.29	86.06

Note: F = Female, M = Male

Table 14 compares the test NCE Mean scores for fourth graders in Mathematics, Reading, Science, and Social Studies for school year 2011 through school year ending 2014 by gender. The Mathematics Mean Difference (MD) score comparison indicates that the only school year where females did better than males was during the school year ending in 2013. Reading Mean Difference (MD) scores indicate that males had lower MD scores during all school years when compared to females. According to table 14, there was no school year in which females scored higher than males in Science. In the area of Social Studies, males generated Mean Difference (MD) scores higher during the school years of 2012 and 2013 but not during the school years of 2011 or 2014. In general, females and males in the fourth grade score lowest in the area of Mathematics and highest in the area of Social Studies. Females tend to have higher test scores in the area of Reading while their male counterparts tend to produce test scores that are higher or equal to females in all other subjects.

Research Question Three

Is there a significant difference in the academic performance of fifth graders on the TCAP after the implementation of the Common Core Standards?

Null Hypothesis Nine

There will be no statistically significant difference in the academic performance of fifth graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Mathematics after the implementation of the Common Core Standards.

Table 15 shows the use of descriptive statistics; a One-Way Repeated Measures Analysis of Variance (ANOVA) was used to compare fifth grade students TCAP Normal Curve Equivalency (NCE) scores in the areas of Mathematics, Reading, Science and Social Studies before and after the implementation of the Common Core State Standards.

Table 15

One-Way Repeated Measures Analysis of Variance (ANOVA) comparison of TCAP NCE scores for fifth graders for the school years 2011 – 2014 in Mathematics, Reading, Science, and Social Studies

Content	N	M 2011	M2014	MD	<i>p</i>
Mathematics	597	88.05	87.51	-.54	.023
Reading	597	86.66	84.20	-2.46	.000
Science	591	88.57	87.13	-1.44	.050
Social Studies	591	92.02	89.28	-2.74	.000

Note: $p < .05$, two-tailed; MD = Mean Difference

Table 16

One-Way Repeated Measures Analysis of Variance (ANOVA) comparison of TCAP NCE scores for fifth graders for the school years 2011 – 2014 in Mathematics

Content	N	M 2011	M2014	MD	<i>p</i>
Mathematics	597	88.05	87.51	-.54	.023

Note: $p < .05$, two-tailed; MD = Mean Difference

The p -value of .023 for the One-Way Repeated Measures Analysis of Variance (ANOVA) test comparing the Mathematics scores for fifth graders with a Mean Difference of -.54 clearly indicated that there was a statistically significant difference between the Mathematics scores for the fifth grade students tested prior to the implementation of Common Core Assessments and the Mathematics scores for the fifth grade students who participated in the Common Core curriculum and the accompanying assessment in Mathematics. Therefore, null hypothesis nine was rejected. (See Tables 15 and 16)

Null Hypothesis Ten

There will be no statistically significant difference in the academic performance of fifth graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Reading after the implementation of the Common Core Standards.

Table 17

One-Way Repeated Measures Analysis of Variance (ANOVA) comparison of TCAP NCE scores for fifth graders for the school years 2011 – 2014 in Reading

Content	N	M 2011	M2014	MD	p
Reading	597	86.66	84.20	-2.46	.000

Note: $p < .05$, two-tailed; MD = Mean Difference

The p -value of .000 for the One-Way Repeated Measures Analysis of Variance (ANOVA) test comparing the Reading scores for fifth graders with a Mean Difference of -2.46 clearly indicated that there was a statistically significant difference between the Reading scores for the fifth grade students tested prior to the implementation of Common Core Assessments and the Reading scores for the fifth grade students who participated in the Common Core curriculum and the accompanying assessment in Reading. Therefore, null hypothesis ten was rejected. (See Tables 15 and 17)

Null Hypothesis Eleven

There will be no statistically significant difference in the academic performance of fifth graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Science after the implementation of the Common Core Standards.

Table 18

One-Way Repeated Measures Analysis of Variance (ANOVA) comparison of TCAP NCE scores for fifth graders for the school years 2011 – 2014 in Science

Content	N	M 2011	M2014	MD	p
Science	591	88.57	87.13	-1.44	.050

Note: $p < .05$, two-tailed; MD = Mean Difference

The p -value of .050 for the One-Way Repeated Measures Analysis of Variance (ANOVA) test comparing the Science scores for fifth graders with a Mean Difference of -1.44 clearly indicated that there was not a statistically significant difference between the

Science scores for the fifth grade students tested prior to the implementation of Common Core Assessments and the Science scores for the fifth grade students who participated in the Common Core curriculum and the accompanying assessment in Science. Therefore, null hypothesis eleven was retained. (See Tables 15 and 18)

Null Hypothesis Twelve

There will be no statistically significant difference in the academic performance of fifth graders on the Tennessee Comprehensive Assessment Program (TCAP) tests in Social Studies after the implementation of the Common Core Standards.

Table 19

One-Way Repeated Measures Analysis of Variance (ANOVA) comparison of TCAP NCE scores for fifth graders for the school years 2011 – 2014 in Social Studies

Content	N	M 2011	M2014	MD	<i>p</i>
Social Studies	591	92.02	89.28	-2.74	.000

Note: $p < .05$, two-tailed; MD = Mean Difference

The *p*-value of .000 for the One-Way Repeated Measures Analysis of Variance (ANOVA) test comparing the Social Studies scores for fifth graders with a Mean Difference of -2.74 clearly indicated that there was a statistically significant difference between the Social Studies scores for the fifth grade students tested prior to the implementation of Common Core Assessments and the Social Studies scores for the fifth grade students who participated in the Common Core curriculum and the accompanying

assessment in Social Studies. Therefore, null hypothesis eleven was rejected. (See Tables 15 and 19)

Table 20

One-Way Analysis of Variance (ANOVA) Pairwise comparisons of TCAP Normal Curve Equivalency (NCE) scores for fifth graders in Mathematics, Reading, Science, and Social Studies for School Years 2011 through 2014

YS	YE	Mathematics		Reading		Science		Social Studies	
		MD	p	MD	p	MD	p	MD	p
2011	2012	-.844	.022	-.162	1.000	-.002	1.000	-.239	1.000
	2013	-.863	.919	-1.065	.190	-1.130	.323	-.660	.624
	2014	-.536	1.000	-2.462	.000	-1.445	.059	-2.734	.000
2012	2013	-.018	1.000	-.901	.454	-1.129	.318	-.421	1.000
	2014	.308	1.000	-2.298	.000	-1.443	.059	-2.496	.000
2013	2014	.327	1.000	-1.397	.067	-.315	1.000	-2.074	.000

Note: $p < .05$, two-tailed; YS = Year Start, YE = Year End, MD = Mean Difference

Table 20 shows the Pairwise comparisons for the Tennessee Comprehensive Assessment Program (TCAP) Normal Curve Equivalency (NCE) scores for fifth graders in Mathematics, Reading, Science and Social Studies when comparing the data for the school years 2011 – 2014. The Mean Differences data in Table 20 reflects data which generates a number of questions and relationships that should be noted and discussed. The Mean Differences (MD) are negative across, not only school years, but also across the various disciplines as well. Additionally, the data analysis indicates that in Mathematics, a statistically significant difference existed when comparing to the student

test scores from the 2011-2012 school year. Reading scores from student data for fifth grade students likewise reflected a statistically significant difference as indicated in Table 20. For the school years of 2011-2014 and 2012-2014, student test scores in Social Studies reflects losses when comparing the Mean Differences (MD). Lastly, when comparing Social Studies scores, each year shows a significant difference when making comparisons with the 2011 student test scores. Mathematics is the only subject area that reflects a positive Mean Difference (MD) in the most recent years since the implementation of Common Core.

Table 21

Comparison of TCAP Normal Curve Equivalency Means by Subject and Gender for fifth graders in Mathematics, Reading, Science, and Social Studies for School Years 2011 through 2014

Year	Mathematics		Reading		Science		Social Studies	
	M	F	M	F	M	F	M	F
2011	87.60	88.57	86.23	87.13	89.50	87.50	92.00	92.01
2012	86.85	87.94	85.79	87.22	89.48	87.42	92.20	91.14
2013	87.48	86.94	85.07	86.12	88.28	86.53	91.51	91.36
2014	86.74	88.46	82.88	85.13	87.28	86.98	89.35	89.17

Note: F = Female, M = Male

Table 21 compares the fifth grade scores for all years and all contents by gender. The Mathematics Mean score comparison indicates that the only school year that males did better than females was in 2013. Reading Mean scores indicate that males generated

lower Mean scores in all testing years when compared to females. According to table 21, there was not a year that females scored higher than males in Science. Social Studies scores were the highest overall. Males scored higher than females every year tested except for 2011. In general, females and males in fifth grade score lowest in the area of Reading and generate the highest test scores in the area of Social Studies. Females score higher in Mathematics and Reading while males score higher Science and Social Studies.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The purpose of this study was to investigate the impact that the Implementation of Common Core has had on student achievement by analyzing Tennessee Comprehensive Assessment Program (TCAP) Normal Curve Equivalency (NCE) student test scores both before and after the implementation of Common Core. In the study, TCAP NCE scores for Mathematics, Reading, Science and Social Studies were used to measure achievement prior to the implementation in 2010-2011 compared to the NCE test scores following the implementation of Common Core assessments for school years 2011-2012, 2012-2013, and for school year 2013-2014. The study also analyzed statistical significance by year. Additional findings regarding gender and Mean scores were compared.

Common Core has received much scrutiny since its inception in 2010. School systems continue to work hard in the effort to better prepare students for the twenty-first century and the implementation of the Common Core State Standards were supposed to support their efforts. Ashoka (2014), points out that the education system has the ability to play an important role in the development of essential skills that students need to succeed. For this reason, it is important that schools know that the curriculum and processes for student development are working to increase student achievement.

Null Hypothesis Conclusions

The goal of this study was to determine if the implementation of the Common Core Initiative has had a significant impact on student achievement. Hypotheses one, two, three and four compared the third grade students' TCAP NCE Mathematics,

Reading, Science, and Social Studies scores prior to implementation in 2010-2011 to the student test scores following the implementation of Common Core assessments in 2011-2012, 2012-2013 and 2013-2014 using a One-Way Repeated Measures Analysis of Variance (ANOVA). All eight elementary schools were included in the analysis, which produced a sample size of 597 students. Results indicated that there was a statistically significant difference before and after the implementation of the Common Core Initiative in the areas of Reading and Social Studies for third graders in the study. Null hypotheses two and four were rejected, indicating that there was a significant change in the Reading and Social Studies TCAP NCE scores for third grade students that were tested before the implementation of the Common Core Initiative compared to the students who were later tested using the Common Core assessments following the implementation of Common Core.

Table 1 data reflects a decline in TCAP NCE Mean scores when comparing the Mean Differences (MD) for each content area for the third grade assessment. Both Reading and Social Studies showed a statistically significant decline at the $p < .05$ level over the four years of 2011-2014 with .000 p -value for Reading and a p -value of .000 for Social Studies as well. When analyzing the data for both Reading and Social Studies further through an examination of the Pairwise ANOVA comparisons in Table 6, one can readily discern at the exact testing point that the statistical significance in comparisons occurred. The Reading data reflected a steady and statistically significant decline in the Mean Difference (MD) each year following the implementation of the Common Core assessments. Statistical significance in the Social Studies scores appeared during the middle of the testing years. The Mean Differences (MD) during the 2013-2014 school

year were less negative than they had been in the previous year for Mathematics, Science and Social Studies. However, that did not hold true for Reading which had a negative Mean Difference (MD) score that was rather sizeable in comparison to the other content areas for that school year. This could be a result of more support for the implementation of Common Core in the areas that made improvements in the test scores.

When comparing males to females in all content areas for third graders (see Table 7), all students TCAP NCE Mean scores clearly reflected some interesting differences. In all content areas, males consistently produced test score Mean Differences (MD) that were more negative than the test score Mean Differences (MD) for the females since 2011. This would lead us to believe that females are more receptive to the methods currently being used to implement the Common Core Standards in the third grade.

Hypotheses five, six, seven, and eight compared the fourth grade students' TCAP NCE test scores in Mathematics, Reading, Science, and Social Studies prior to implementation in 2010-2011 to the student test scores following the implementation in 2011-2012, 2012-2013 and 2013-2014 using a One-Way Repeated Measures Analysis of Variance (ANOVA). All eight elementary schools were included in the analysis, which gave a sample size of 597 students. Results indicated that there were statistically significant differences in test scores when comparing the results for fourth graders prior to the implementation to the student test scores following the implementation of the Common Core assessments in Mathematics, Reading, Science, and Social Studies. The null hypotheses five, six, seven and eight were rejected indicating that there was a statistically significant difference in the TCAP NCE test scores for fourth grades when comparing the pre implementation of the Common Core assessment results and the post

Common Core assessment results in Mathematics, Reading, Science, and Social Studies.

The TCAP NCE Mean Differences (MD) reflected in Table 14 indicates a decline in TCAP NCE Mean scores when comparing Mean Differences (MD) for each content area on the fourth grade assessment. All tested subjects had test results that reflected a statistically significant decline over the four years at the $p < .05$ level of significance.

To further examine the differences in the student test scores when comparing pre and post implementation of Common Core and their significance, a Pairwise Analysis of Variance (ANOVA) comparison was completed. By looking at the student test score Mean Difference (MD) and p -values in Table 13, the data indicates that the Mean Differences (MD) for Mathematics, Science and Social Studies were statistically significant at the $p < .05$ level when comparing the 2011 school year pre-Common Core assessment data to the 2014 post-Common Core assessment implementation for the 2014 school year. The p -value for the comparison of test data for pre-Common Core assessment data compared to the post-Common Core assessment data was .000 with a Mean Difference (MD) of -3.147 for Mathematics; a p -value of .002 with a Mean Difference (MD) of 2.270 for Science; and a p -value of .000 with a Mean Difference (MD) of -2.893 for Social Studies. Additionally, the Science test scores were statistically significant when comparing the student test data from pre-Common Core assessments for 2011 to the student test data from the post-Common Core assessment year of 2014. Additionally, statistically significant results occurred when comparing the fourth grade Science test scores between 2012 to 2013 with a p -value of .035, and from 2012 to 2014 with a p -value of .001.

Social Studies tests were determined to be statistically significant for each comparison year with p -values for the comparison years as follows: 2011-2012, p -value was .000 with a Mean Difference (MD) of .099; p -value for 2011-2013 was .305 with a Mean Difference of -.866; 2011-2014 the p -value was .000 with a Mean Difference of -2.893; 2012-2013 the p -value was .172 with a Mean Difference (MD) of -.965; 2012-2014 the p -value was .000 with a Mean Difference (MD) of -2.992; and 2013-2014 the p -value was .000 with a Mean Difference (MD) of -2.027. Mathematics data produced a positive Mean Difference (MD) when comparing test data between 2013 and 2014. The other content areas, Reading, Science, and Social Studies had smaller Mean Differences (MD). This indicates a degree of improvement from previous testing years.

Using Table 14 to compare the Mean scores between males and females in the fourth grade, the data results reported in the table indicates that no content area tested generated a positive difference in the Mean score. Therefore, since the implementation of Common Core, TCAP NCE scores have not shown significant growth differences between the male and female students. In the content area of Science, fourth grade female Mean scores were less than the male Means for the test years 2011, 2012, 2013, and 2014. In Mathematics, fourth grade female students had lower Mean scores than male students in 2011, 2012, and 2014. In Social Studies, fourth grade female Mean scores were less for the test years 2012 and 2013. However, in the content area of Reading, fourth grade female test Mean scores were less than male Mean test scores for every year tested, 2011, 2012, 2013, and 2014.

Hypothesis nine, ten, eleven and twelve compared the fifth grade students' TCAP NCE Mathematics, Reading, Science, and Social Studies scores prior to the

implementation of the Common Core assessments in 2010-2011 to the fifth grade assessment scores after the implementation of the Common Core assessments in 2011-2012, 2012-2013 and 2013-2014 using a One-Way Repeated Measures Analysis of Variance (ANOVA). All eight elementary schools were included in the analysis, which produced a sample size of 597 students. Results indicated that there was a statistically significant difference when comparing student test scores prior to the implementation of Common Core assessments and the test scores following the implementation of Common Core Assessments. Null hypotheses nine, ten and twelve were rejected indicating that there was a statistically significant difference in test score results in Mathematics, Reading, and Social Studies TCAP NCE scores for the students that were tested prior to the implementation of the Common Core and the assessments compared to the test scores for the students tested subsequent to the implementation of the Common Core and the accompanying assessments.

Table 15 provides test data Mean Difference (MD) scores for fifth graders tested prior to the introduction of the Common Core testing compared to the test scores for fifth graders tested after the implementation of the Common Core Initiative. Table 15 indicates a decline in the TCAP NCE Mean scores when comparing the Mean Differences (MD) for each content on the fifth grade test. Tests conducted on the test scores in Mathematics, Reading and Social Studies generated test results that reflected a statistically significant difference at the $p < .05$ level of significance. The p-value for Mathematics was .023 with a Mean Difference (MD) of -.54; a p-value for Reading of .000 with a Mean difference of -2.46; a p-value for Social Studies of .000 with a Mean Difference (MD) of -2.74. All content test scores reflected negative results when

comparing fifth grade test scores prior to the implementation of Common Core to the student test results after the implementation of Common Core. This reflects a decrease in student test score for Mathematics, Reading and Social Studies for the fifth graders. Science test scores were borderline between statistically significant and not being statistically significant with a p-value of .050 and a Mean Difference (MD) of -1.44. Across the board, student test scores decreased after the implementation of the Common Core Initiative as is illustrated in their Mean Differences in Table 15.

Using Table 20, a One-Way Analysis of Variance (ANOVA) Pairwise Comparison was completed to analyze where the statistical significance existed. Mathematics TCAP NCE means scores reflected a statistically significant difference when comparing 2011 and 2012. Comparisons for Reading scores for the school years of 2011-2013, 2011 and 2014, and 2012-2014 have shown statistically significant differences also. Additionally, Social Studies produced a statistically significant difference at the $p < .05$ level every post-Common Core test year when compared with the pre-Common Core test year of 2011. The differences are negative, assuming a decrease in student achievement after the implementation of Common Core. Mathematics shows a positive mean difference for comparison years of 2012 and 2014, as well as between 2013 and 2014.

TCAP NCE scores were also compared to analyze females and males in the fifth grade. According to Table 21, all content areas for both male and female students show no gains in NCE Mean scores after the implementation of Common Core. In all subjects except Social Studies, female fifth graders had a smaller negative mean difference than

males. Therefore, males have shown a larger negative mean difference in Mathematics, Reading, and Science.

Recommendations

Based on the results of this field study, the following recommendations are made:

1. This field study revealed a negative statistical change in student achievement for third grade students in the areas of Reading, and Social Studies after the implementation of the Common Core Initiative. The Dickson County School System could use these results to find ways to enhance the current implementation of the Common Core Standards to increase student achievement for third grade students.

2. This field study revealed a negative statistical change in student achievement for fourth grade students in all contents after the implementation of the Common Core Initiative. The Dickson County School System could use these results to find ways to enhance the current implementation of the Common Core Standards to increase student achievement for fourth grade students.

3. This field study revealed a negative statistical change in student achievement for fifth grade students in the areas of Mathematics, Reading, and Social Studies after the implementation of the Common Core Initiative. The Dickson County School System could use these results to find ways to enhance the current implementation of the Common Core Standards to increase student achievement for fifth grade students.

Conclusions

Schools continue to face the increasing demands for student growth in the twenty-first century. Expectations of students after graduation continue to increase and become more challenging for schools and students in their quest for higher achievement scores.

The Common Core Initiative was created to fit the mold for those needs so that students are better prepared. The Common Core Initiative is still new in its implementation. It is important to realize that the newly implemented process is providing an increase in student achievement.

Based on this study, there was a statistically significant difference between the implementation of Common Core State Standards and student achievement on the TCAP based on NCE scores. Each grade level had different results, but all have shown a negative mean difference since the implementation of the new standards. Schools who have decided to adopt the initiative need to monitor student achievement to see if it is providing positive results for student's readiness.

In conclusion, during the implementation process, data should be analyzed and professional development should be provided for areas where negative significant differences exist. Due to the fact that the Common Core Initiative is new, it is possible that the methodology used is new for many teachers in today's schools making it that much more important to support them appropriately by providing professional development and support.

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APPENDICES

APPENDIX A

Letter from the Dickson County School System Granting Permission to Conduct the
Study

Stewart, Gary

From:
To:
Subject:

Alysia Latchford <latcam10@hotmail.com>
Wednesday, May 07, 2014 6:03 PM
Stewart, Gary
FW: Alysia Durham - ED.S Program @ APSU

Dr. Stewart,

Here is my consent from Dr. Weeks.

Alysia

> From: Alysia.Durham@am.dodea.edu
> To: latcam10@hotmail.com
> Subject: FW: FW: Alysia Durham - ED.S Program @ APSU
> Date: Tue, 15 Apr 2014 12:51:08 +0000

> -----Original Message-----

> From: Danny Weeks [mailto:DWeeks@dcbe.org]
> Sent: Tuesday, April 15, 2014 7:48 AM
> To: Durham, Alysia, Ms., CIV, OSD/DoDEA-Americas
> Subject: Re: FW: Alysia Durham - ED.S Program @ APSU

> Alysia,
> I am very good with the study - if you need a formal letter of permission, I will be glad to provide one.
> Please let me know what our office can do to assist.

> Danny L. Weeks, Ed.D.
> Director of Schools
> Dickson County Schools
> Dickson, TN 37055
> 615 446-7571

> "Much is Expected" - Lk 12:48

> >>> "Durham, Alysia, Ms., CIV, OSD/DoDEA-Americas" <Alysia.Durham@am.dodea.edu> 4/7/2014 1:31 PM
>>>

> Good afternoon,
> I just wanted to touch base and make sure that I am good-to-go with the topic that we discussed. Hope all
well in your part of town!

> Alysia Durham

APPENDIX B

Approval Letter from the Austin Peay State University Institutional Review Board

Granting Permission to Conduct the Study



**AUSTIN PEAY STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD**

Date: 6/2/2014

RE: 14-025 The Impact of Common Core on Student Academic Achievement

Dear Alysia Durham,

We appreciate your cooperation with the human research review process at Austin Peay State University.

This is to confirm that your research proposal has been reviewed and approved for exemption from further review. Exemption is granted under the Common Rule 45 CFR 46.101 (b) (4); the research involves only the study of existing data, the data is recorded in such a manner that the subjects cannot be identified directly or through identifiers.

You may conduct your study as described in your application, effective immediately. Please note that any changes to the study have the potential for changing the exempt status of your study, and must be promptly reported and approved by APIRB before continuing. Some changes may be approved by expedited review; others require full board review. If you have any questions or require further information, you can contact me by phone (931-221-6106) or email (shepherdo@apsu.edu).

Again, thank you for your cooperation with the APSU IRB and the human research review process.

Sincerely,

Omie Shepherd, Chair
Austin Peay Institutional Review Board

Cc: Dr. Gary Stewart