The Effectiveness of the Teacher-leader Professional Development Model for Common Core State Standards Implementation

By

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Abstract

No Child Left Behind, hereafter referred to as NCLB, has given us an age of accountability for America's schools that includes high stakes tests for students at various grade levels. Those tests are used to measure a child's knowledge of standards in each core subject area including math, science, language arts, and social studies. The standards and tests that are used are developed by each state giving autonomy for the development of those standards, assessments, and accountability to be left as a local or state decision. The concept is that states have diversity that should be accounted for in education. Reformers in America today argue that states cannot be compared to each other regarding student achievement because of a lack of Common Core State Standards (CCSS) and assessments. President Barack Obama introduced the concept of Common Core State Standards for all states through his education reform initiative known as Race to the Top (RTTT). Ohio received federal grant money from Race to the Top in order to establish the Common Core State Standards and assessments that will be utilized to determine accountability measures for each Ohio public school district. The Ohio Department of Education (ODE) has chosen Ohio's system of educational service centers to provide teachers with professional development regarding implementation of those standards. The Mahoning County Educational Service Center (MCESC) has chosen the teacher-leader model to deliver the professional development to each school in the county. In the model, each district sends a teacher for each subject for elementary and secondary grades to a series of trainings on common core. Those teachers are then responsible for providing training back at their respective districts for all of the other teachers in their respective

subject and grade levels. The purpose of this dissertation is to determine the effectiveness of the model on student achievement through analyzing research and student assessment data from every school in Mahoning County. The schools that participated in the professional development model will be used as the experimental group, whereas the schools that have not participated will be used as the control group. The dependent variable of student achievement scores will be used to determine any significant change in scores.

Keywords: professional development, teacher-leader model, Ohio Achievement Assessments, Common Core State Standards

TABLE OF CONTENTS

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Dedication

This dissertation is dedicated, first, to my family. My wife Pam has supported me and allowed me to dedicate the time and effort necessary to complete this task. She is a great wife, mother, and teacher.

My sons Keary and AJ are everything a parent could want their children to be. It has always been my first purpose to provide love, guidance, and inspiration so that they might have a better life. I hope the completion of this research sets an example and provides inspiration.

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Chapter I

President Barack Obama introduced the concept of Common Core State Standards through his Race to the Top initiative. The initiative is meant to raise the level of accountability and competition in public education through comparisons and rank ordering of schools by implementing common assessments similar to the National Assessment of Educational Progress (NAEP). The state of Ohio was awarded an RTTT grant in the second round. The Ohio Department of Education (ODE) decided to use the system of educational service centers to deliver professional development to train teachers in the use of Common Core State Standards. The purpose of this study is to determine the effects on student achievement of the teacher-leader model for professional development in the Common Core State Standards used by the Mahoning County Educational Service Center (MCESC) with its 14 member school districts and one community school district. The independent variable in this study is the professional development offered to the districts. The dependent variable in this study is the test scores of all the students in the county on Ohio Achievement Tests administered in grades four through eight. The experimental group in the study is the group that attended and implemented the model. The control group includes data from schools that did not participate in the professional development. A comparison and analysis of the differences in scores determined the effectiveness of the professional development model. The study will be used as a guide for the other 54 ESCs across the state as well as by the Ohio Educational Service Center Association (OESCA) in an attempt to provide lawmakers with scientific evidence that will allow them to make informed decisions about future funding models for such development. It is relatively common to assume that there are

many other variables that are not taken into account in this study that might also affect data such as poverty levels, disabilities, efficacy, etc. The literature review includes a brief history of standards-based education in the United States and the movement towards a set of Common Core State Standards used by all schools in assessing students to provide comparisons of effective states, schools, teachers, universities, etc. It also includes information on professional development models and highlights the teacher-leader models that have been used and the research that has been conducted to determine its effectiveness. The literature review also includes information on educational service centers.

Problem Statement

The MCESC provides professional development for teachers and administrators on various components in education. The MCESC often acts as an arm of the ODE to help in implementing reform initiatives and other changes in requirements either voted in by legislators or acted on by other executive agencies. The MCESC is funded for this purpose through a formula that determines each district's contribution to curriculum and instruction supervision. There have been numerous discussions about ESCs and their function related to education in general and, more specifically, the cost of education. It is important for the survival of ESCs in Ohio to be able to provide information to lawmakers on the functions of ESCs and, more importantly, the effectiveness of ESCs. The teacher-leader model is the chosen model used by the MCESC to train teachers in 14 districts in Mahoning County on Common Core State Standards. This study measures its effect.

Potential Contributions

The potential contributions of this study are that other ESCs in the state of Ohio may use a similar study to determine the effectiveness of their professional development. Lawmakers in Ohio may have scientific evidence that ESCs are effective and are a vital component in raising student achievement. The outcome of this study will enable administrators to determine the best methods for professional development.

Outcome Measure

The outcome measure for this dissertation is student achievement. This variable contributes to the identification of moderators in the studies for the fixed effects model to analyze the impact of the teacher-leader model of professional development for Common Core State Standards.

Research Questions

The emphasis of this dissertation is to examine the effectiveness of the teacher-leader model of professional development for Common Core State Standards on student achievement. The question that frames the study is:

What is the impact on student achievement as determined by Ohio Achievement Test data as well as value-added data of the teacher-leader model used to train teachers on Common Core State Standards?

Limitations of Study

This study is designed to determine the effect on student achievement of the teacher-leader model of professional development used in training teachers on Common

Core State Standards. There are many variables that can affect student achievement. Some of these variables are not limited to, but may include:

- Lack of alignment of assessments to Common Core State Standards;
- Achievement test data that may not be a good indicator of student achievement;
- Achievement test data that may not be a good indicator of an effective teacher;
- The efficacy of the teacher-leader;
- The ability for each school to empower teacher-leaders to enable colleagues to implement Common Core State Standards;
- The efficacy of the Common Core State Standards trainer;
- Other factors that might impact student achievement beyond Common Core State Standards; and
- The fidelity of training district teachers.

It is relatively common to assume that any professional development in which teachers actively participate will raise student achievement. The teacher-leader model has shown to indirectly increase achievement by improving variables that effect achievement such as culture and efficacy.

Working Definitions

Professional Development – Teachers use training provided by an accredited source to remain current on research- based strategies and methods to help become more effective with student achievement.

Teacher-Leader Model – Professional development model for training teachers. A teacher from a district will be sent to receive training on standards and assessment for a particular subject. That teacher then trains other respective teachers in the school or district.

Ohio Achievement Assessments – Grade level, subject level tests used to evaluate student learning in Ohio. The tests are usually multiple choice and extended response in the subject areas of language arts and math for grades four through eight. The Ohio Graduation tests are given to tenth graders and the subjects include math, science, social studies, reading, and writing. The score ranges are basic, limited, proficient, advanced, and accelerated.

Common Core State Standards – Nationally recognized standards in each subject which all children should have knowledge of and be able to demonstrate skills. The state of Ohio has recently adopted Common Core State Standards in math, language arts, science, and social studies.

Chapter II

Literature Review

Chapter Two will present a history of events that led to Ohio's adopting Common Core State Standards to be used for assessing student achievement. It will include a summation of Common Core State Standards and a description of the teacher-leader model that is used to implement Common Core State Standards. This chapter will provide information that will support the need for the study and for the reader to better understand the components that determine the validity of the study both internally and externally. Also included are timelines, definitions, and other research done on the subject. A description of other forms of professional development and an overview of the functions of educational service centers are included.

No Child Left Behind

In 1965, President Lyndon B. Johnson signed into law the Elementary and Secondary Education Act (ESEA). The law was intended to improve education in the United States by providing funding to schools to be used in six areas known as Titles I-VI. Title I of the law provides funding for schools to be used for the education of children from low income families. Title II of the law provides funding for school library resources, textbooks, and instructional materials. The current funding for Common Core State Standards implementation in the states comes from Title II of No Child Left Behind (NCLB). Title III of the law provides schools with funding for supplemental educational centers and services. Title IV of the law provides schools with funding for research and

training. Title V of the law provides funding directly to states to strengthen their departments of education. Title VI of the law provides schools funding for the education of children with disabilities. Finally, in 1967 the law was amended to include Title VII which provides schools with funding for bilingual children educational programming (NCLB, 2004). The law was originally authorized until 1970. Congress has reauthorized the law every five years. In 2001, President George W. Bush signed into law the NCLB Act as the reauthorization of ESEA (NCLB, 2004).

The culture and circumstances that existed at the time ESEA was originally enacted were not unlike conditions in 2001 when NCLB was enacted, and recently, in 2009, as President Obama attempted to reinvent the act by allowing states flexibility through the RTTT initiative. Policy inputs can originate from many different sources. The educational political issues that surrounded the ideas of ESEA were specifically segregation and funding for sectarian, non-public schools. Title I of ESEA provided funding for the education of low income families. Title I also stipulated that any school receiving funding had to be desegregated. The federal budget for education jumped from $1.5 billion to $4 billion after the first year of its passage (Hanna, 2005). The original ESEA law enacted was successful in fighting against segregation. Schools in the south could not resist the federal aid provided for them by ESEA. They were forced to desegregate. With desegregation came schools that not only had mixed racial groupings, but also mixed ability groups. ESEA also revealed the achievement gap that existed between poor children and affluent children, between White and Black, and between males and females. The Coleman Report, in 1966, revealed that the education level in the

early years impacted student performance over an extended period of schooling (Hanna, 2005).

ESEA continued to provide an increase in funding for schools to be used to close the achievement gap. In 1979, President Carter signed the Department of Education Organization Act which created the United States Department of Education (ED). Initially, the mission of the Department was to gather statistics and report on the effectiveness of the title programs created by ESEA. When President Carter was defeated in 1980, there was fear that the Department might be abolished under the Reagan policies of limited federal government. In 1981, President Reagan appointed Terrel H. Bell as Secretary of Education. His original charge was to dismantle the department, but in 1983, the Department, under Bell's guidance and the National Commission on Excellence, released *A Nation at Risk*. The report found that 13% of 17 year olds were "functionally illiterate", SAT scores dropped to an all-time low, and many students needed remedial courses in college. According to the ED, university presidents, eminent scientists, policy makers, and educators said that the United States had "lost sight of the basic purposes of schooling, and of the high expectations and disciplined effort needed to attain them" (ED, 2008, p. 2). There have been numerous criticisms of *A Nation at Risk* including those who claim that statistics were overstated and that the report was a "manufactured crisis" to limit teacher unions and allow for school choice advocates to effectively lobby legislators for passage of accountability and standards legislation. The Commission also outlined recommendations for change in five different areas: curriculum content standards and expectations of students, time devoted to education, teacher quality, educational leadership, and the financial support of education (ED, 2008).

The two areas that truly affected the content of this dissertation came in its recommendations on curriculum and standards. ODE reported that the Commission recommended minimum state and local high school graduation requirements including English, math, science, and social studies (ODE, 2001). The creation of these minimum requirements also led the way for adoption of standards which, until then, was adamantly opposed because states and local school boards always had autonomy and control over curricular requirements. In 1983, the Commission recommended "that schools, colleges, and universities adopt more rigorous and measurable standards, and higher expectations for academic performance…and that four year colleges and universities raise their requirements for admission." (ED, 2008, p.5) Thus, the idea of "standards- based" education was born.

Many states began to implement their own system of standards. Ohio began its implementation of academic content standards with Language Arts in 2001 (ODE, 2001). Other states adopted standards as early as 1988. They were not often very clear, specific, or academically rigorous. The states worked next on creating tests and adopting textbooks that aligned to the standards (ED, 2008). Resources that were aligned to the standards were difficult to find. Because of the lack of resources, many teachers relied on old resources that were not fully aligned. Many schools had to focus attention on new forms of professional development to properly train teachers in the implementation of new standards and how to measure student progress in relation to the standards.

Two pieces of legislation were passed under President Bill Clinton: The *Improving America's Schools Act of 1994,* which required state academic content standards along with assessments to measure those standards, and the *Goals 2000:*

Educate America Act, which provided for federal funds to aid states in writing those content standards. Both Acts were passed as the reauthorization of ESEA. Congress appropriated $105 million for the creation of world-class academic standards to measure student progress and to provide support and professional development to help students meet the standards. The laws included six education goals concerning school readiness, school completion, student academic achievement, leadership in math and science, adult literacy, and safe and drug free schools. The National Education Goals stated in the law were:

- All children in America will start school ready to learn;
- The high school graduation rate will increase to at least 90%;
- All students will leave grades four, eight, and 12 having demonstrated competency over challenging subject matter including English, mathematics, science, foreign languages, civics and government, economics, the arts, history and geography, and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our nation's modern economy;
- United States students will be first in the world in mathematics and science achievement;
- Every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship;

- Every school in the United States will be free of drugs and violence and the unauthorized presence of firearms and alcohol and will offer a disciplined environment conducive to learning;
- The nation's teaching force will have access to programs for the continued improvement of their professional skills and the opportunity to acquire the knowledge and skills needed to instruct and prepare all American students for the next century; and
- Every school will promote partnerships that will increase parental involvement and participation in promoting the social, emotional, and academic growth of children.

The Act also established a National Education Standards and Improvement Council to examine and certify national and state content standards and assessments. Finally, the National Skills Standards Board was created to establish standards for school-to-work (Guskey, 2002).

No Child Left Behind Act of 2001

George W. Bush was elected to the presidency in the fall of 1999. He quickly began to call for educational reforms at the federal level that would ensure accountability for public education. The 2001 reauthorization of the ESEA Act was titled *No Child Left Behind* and was passed by congress with a bipartisan majority and signed into law by Bush (ED, 2008). The law established:

- Annual testing in grades three through eight in reading and math. States' requirements to establish graduation tests in the four major subject areas;

- States' requirements to bring all students to the proficient level by 2014. Adequate Yearly Progress as a benchmark for schools on a yearly basis to reach the goal. Corrective measures established for schools that successively failed to reach the yearly benchmarks for three straight years;
- States' requirements to furnish annual report cards showing student achievement results broken into subgroups;
- That every teacher in core content areas by 2006 had to be "highly qualified" (HQT) in each subject taught. HQT criteria included semester coursework to certify and demonstrate proficiency in each subject. Para professionals' requirements to have at least an associate's degree to be qualified to work with Title I eligible students; and
- Reading First grants' availability in 2004 to help states set up scientific based reading programs for children in grades K-3.

The law caused considerable debate among lawmakers and educators regarding the federal mandates to typically state run public education systems. The validity of assessments and the use of mandated standards were questioned. An opinion poll released in December 2003 found that nearly half of school principals and superintendents found the law to be politically motivated or aimed at undermining public education (NCLB, 2004). Because of the requirement to evaluate school progress on the basis of demographic subgroups, the law might disproportionately penalize schools with diverse student populations (NCLB, 2004).

Reauthorization of ESEA, as stated earlier, usually occurs every five years. There has been considerable debate over the last 12 years about the effectiveness of NCLB. In

2007, in a study conducted by the Cato Institute, Neal McCluskey and Andrew Coulsen concluded that:

- The law did not appear to have a significant impact on improving math or reading achievement;
- It has not significantly reduced the achievement gap; and
- It did not enhance states that did not previously test for achievement.

This report refuted claims made by then Secretary of Education, Margaret Spellings, and Congressman John Boehner, that NCLB had been effective in closing gaps and increasing achievement (McCluskey, 2007). The report also concluded that there was "appreciable evidence that NCLB may have slowed or even partly reversed gains achieved before its passage" (McClusky, 2007).

The debate over the effectiveness of NCLB and the possible reauthorization has continued and, currently, the U.S. Congress has yet to reauthorize the ESEA Act.

Common Core State Standards

A critique of NCLB is that there is no federal mandate for Common Core State Standards and assessments that can be used to measure achievement and compare results from state to state through use of the National Assessment of Educational Progress (NAEP). Currently, states use state developed standards and assessments to measure achievement. These standards are not all currently aligned with the national assessment; therefore, argument can be made that it cannot be used for comparison. Also, a disparity in content rigor exists among the state developed standards (RTTT, 2009).

The current results from NAEP show American students falling behind other countries in math and science. The push for mandated Common Core State Standards has been the result of these shortcomings by NCLB. Common Core State Standards are defined as a set of content standards that define what students must know and be able to do that are substantially identical across all states in a consortium. A state may supplement the Common Core State Standards with additional standards provided the additional standards do not exceed 15% of the state's total standards for that content area (RTTT, 2009). Content is only a part of the fundamentals of Common Core. Common Core also refers to the acceleration of student achievement through continuous improvement of instruction and increased personal and shared accountability for raising levels of student achievement (ED, 2010).

Race to the Top

On February 17, 2009, President Barack Obama signed into law the American Recovery and Reinvestment Act of 2009 (ARRA), designed to stimulate a suffering economy (ED, 2009). The ARRA laid the foundation for education reform by supporting innovative strategies that would lead to long term effects (ED, 2009). A competitive grant process provided $4.35 billion through which states would be eligible based on applications that included conditions for reform (ED, 2009). States' applications would be judged based on the following reform areas (ED, 2009):

- Adopting standards and assessments that prepare students to succeed in college and the workplace and to compete in the global economy;

- Building data systems that measure student growth and success, inform teachers and principals about how they can improve instruction;
- Recruiting, developing, rewarding, and retaining effective teachers and principals, especially where they are needed most; and
- Turning around our lowest achieving schools.

The key point in the Race to the Top initiative (RTTT), in regard to this paper, is the criteria for application that included the adoption of Common Core State Standards and assessments. States would not be eligible for RTTT dollars if they did not include in their application a timeline for adoption and transition to Common Core State Standards in math, language arts, science, and social studies (ED, 2009). Secretary of Education Arne Duncan spoke about the need for Common Core State Standards during his speech announcing RTTT at the 2009 Governors Education Symposium. "Governor Hunt called for Common Core State Standards when it wasn't politically popular. His institute has done important work with the National Research Council that shows there is political will to accomplish this task today" (ED, 2010, p.1). Secretary Duncan also commented on the need for states to take responsibility for implementing national standards without fear of federal over-reaching. "Education is a state and local issue. You pay 90 percent of the tab, and our job is to support leaders like you" (ED, 2009, p. 4). Finally, Duncan made his case for the reason standards are necessary. "Today, our standards are too low and the results on international tests show it. Worse yet, we see the signals in the international economy as more and more engineers, doctors, and science and math Ph. Ds come from abroad" (ED,2010, p. 5).

Phase I of the grant began in January 2010. Awards for phase I were announced in April 2010. Tennessee and Delaware were the only states awarded at that time. Ohio did apply for phase I (ED, 2009). Winners of Phase II were announced in August of 2010. Ohio was awarded along with nine other states and the District of Columbia (ED, 2010). A total of 46 states applied for funds in phases I and II. All 46 states had to include adoption of Common Core State Standards in their applications in order to qualify for review (ED, 2010). The Ohio award initiated the process of the implementation of Common Core State Standards and assessments and the eventual implementation of the teacher-leader model as the professional development model used for implementation.

Application Criteria B: Standards and Assessments of Ohio's application for the RTTT grant include goals for Ohio to adopt new standards and assessments (ODE, 2013):

- Goal B (1) Ohio will adopt rigorous new standards, together with aligned assessments and teacher supports that will form the foundation of a comprehensive system to enable Ohio's students to succeed globally in the 21st century. Additionally, the adoption and implementation of new standards will ensure access to rigorous coursework and expectations for all of Ohio's students;
- Goal B (2) Ohio will adopt an effective system of student assessment that: (a) contains multiple measures that are employed throughout the course of learning, (b) blends traditional testing with curriculum-embedded performance tasks, (c) engages teachers as partners in the process and honors their judgments, (d) uses technology to assess various item types, provide immediate feedback, offer reliable data, and reduce costs, and (e) promotes a culture of continuously monitoring student growth; and

- Goal B (3) Within three years, every educator in Ohio is teaching to the State's enhanced standards and has the necessary supports and resources to do so effectively. All Ohio educators will utilize multiple forms of assessments, including summative and formative, to monitor student progress and to personalize instruction. The combination of rigorous standards and high-quality assessments will inform instruction, professional development, and policy.

According to the monthly report, 100 % of teachers, by the end of the 2013-2014 school year, shall have accessed newly revised standards and associated curriculum supports online as well as participate in at least one standards awareness or professional development program (ODE, 2013). Assurance area B had a total allocated budget of $19.9 billion (ODE, 2013).The quarterly benchmark chosen for year three activities was March 24, 2013 for the trainer sessions to be conducted on the newly adopted standards, model curriculum, and assessment (ODE, 2013).

Teacher-Leader Model

There are many methods of professional development that can be used to help schools implement a program or method of teaching. Educational professional development is defined as "a career-long process in which educators fine-tune their teaching to meet student needs" (Maggioli, 2004, p.2). Professional development can be accessed or delivered in many forms such as online courses or traditional direct graduate coursework. "What attracts teachers to professional development is their belief that it will expand their knowledge and skills, contribute to their growth, and enhance their effectiveness with students" (Guskey, 2002, p. 382). Professional development programs based on the assumption that change in attitudes and beliefs

comes first are typically designed to gain acceptance, commitment, and enthusiasm from teachers and school administrators before the implementation of new practices or strategies (Guskey, 2002). In general, though, reviews of professional development research consistently point out the ineffectiveness of most programs (Cohen, 1998). The majority of programs fail because they do not take into account what motivates teachers to engage in professional development and the process by which change typically occurs (Guskey, 2002). The teacher-leader model of professional development is based on trained or experienced teachers "coaching" other teachers on a particular method or program designed to change student outcomes (Institute for Educational Leadership, 2001). There is much research that shows a positive effect when the teacher-leader model is used in many capacities. There is not much research that specifically shows the effect of the train-the-trainer model of professional development on student achievement.

There is plenty of research that shows improved student achievement when collaboration, community, and professionalism are present in the culture of the educational process (Hickey, 2005).

Historically, overall responsibility for the schools' operation has fallen to a single individual: the principal - a role that through much of the last century has been largely vested in managerial expertise (Alejano, Knapp, Marzoff, & Portin, 2006). Reformers believe that the teacher's role in instructional leadership is important because of the greater demands on principals and that in order for true reform initiatives to take place, it must have the teacher as the leader in implementation (Institute of Educational Leadership , 2001) The rationale behind using teachers as

more than “funneling information into schoolchildren” is that there is infinite potential for teachers to share their “hard earned knowledge and wisdom with players in education’s decision-making circles”(Institute of Educational Leadership, 2001).

The concept that leadership makes a difference in schools is also a key component in determining that the teacher-leader model might be an effective model that would facilitate increasing student achievement. There is an abundance of research that shows a connection between instructional leadership and learning outcomes (Alejano et al., 2006). There is also much research that shows that the most important variable in determining student success is the teacher (Shelton, 2009).

There are many roles as leaders that are available for teachers. How schools use their teachers and in what capacity vary greatly (Shelton, 2009). The need for teachers to assume different roles other than the traditional roles is related to the workload and responsibilities that have been placed on building principals (Alejano et al., 2006). The leadership roles and responsibilities of principals have evolved greatly over the last three decades (Murphy, 1992). In the 1980s, the leadership roles began to transform because of the influence of *A Nation at Risk.* In the 1990s, reform laws such as Goals 2000 shifted groundwork for principals to become more involved with outcomes in the classroom. In the 2000s, the principal’s role has taken on accountability for student performance (Alejano et al., 2006). The shift from a focus on the individual titular leaders and individual behavior to a focus on the valued ends of the systems that leaders lead has helped to redirect attention from “management” of schools to “leadership” (Murphy, 2002). A new leadership agenda that includes guiding and improving the school implies a new set of roles and responsibilities and

the attendant authority to diagnose complex modern challenges and doggedly focus the attention of the school and its community on the aim of powerful and equitable learning opportunities (Alejano et al., 2006).

Research exists that demonstrates that leaders affect students' learning (Alejano et al., 2006). The teacher-leader model was chosen by the MCESC because of the research that shows the effect of the teacher-leader assuming other leadership roles and responsibilities on how students perform. Leaders' effects on learning appear to involve more than just student learning. In this broader conception, leadership practice relates, in principle, to a broad learning improvement agenda in the school around three learning tenets:

- Student learning – framed in broad terms to include more than achievement on single measures such as test scores;
- Professional learning – including the array of skills, knowledge, and values that teachers and administrators gain from practice itself, formal attempts to develop their professional capacities while on the job, and from initial preparation for their professional positions; and
- System learning – conceived of as "insight into the functioning of the system as a whole to develop and evaluate new policies, practices and structures that enhance its performance." (Knapp, 2003, p.11)

It is clear that initial preparation for school leadership can never teach aspiring leaders all they need to know to assume the kind of school leadership roles envisioned in the concept of the teacher-leader model for professional development (Davis, 2005). New practices and strategies have been developed by school systems to redefine

leadership roles, responsibilities, and authority allocations (Alejano et al., 2006). One such practice involves developing new models of leadership based on distributing leadership practices across the school organization (Alejano et al., 2006). Included among those leadership practices are:

- Creating instructional specialists or "coaching" roles;
- Formalizing teacher-leadership roles focused on instructional improvement;
- Creating or fostering professional learning communities; and
- Redesigning and differentiating administrative roles.

The teacher-leader model for professional development was developed out of these concepts. Rather than create wholly new instructional leadership positions, as in the coaching arrangements, this system seeks to designate teachers in formal roles of "teacher-leader" or "mentor" which places the teacher at the center of instructional improvement (York-Barr & Duke, 2004). An example of the model is Connecticut's Beginning Educator Support and Training (BEST) program, which provides new teachers with an induction support team of veteran teachers (Murphy, 1992). Accomplished teachers attaining National Board Certification are also being used in some jurisdictions to support instructional practice of their colleagues (Berry, Johnson, & Montgomery, 2005).

Current Research

The train-the-trainer model is being used by some states to implement Common Core State Standards (Kavanaugh, 2012). In Tennessee and Ohio for example, the state

selects exemplary educators to serve as core coaches who facilitate training sessions across the state (Kavanaugh, 2012). As stated earlier, there is a lack of research that specifically links the achievement levels of students to specifically common core professional development using the teacher-leader model. There is also limited research that links student achievement to the train-the-trainer-model for any professional development. There is also little known about the other types of professional development and the methods used to deliver Common Core State Standards in each of the states that have participated (Center, 2013). A preponderance of the existing research on the impact of a train-the-trainer type of professional development is related to some qualitative evidence that links an increase in school culture variables such as collaboration and professionalism. An example of the type of research that has been conducted is a study in rural Texas. The district conducted surveys of both the teachers who conducted the professional development as well as those who were active participants. The results showed that peer-led professional development is strongly perceived by the presenters as increasing faculty togetherness or community (Hickey, 2005). As is the case in much of the current research, no additional investigation examined impact on student achievement to research increased student achievement in the district for those teachers that expressed an increase in professionalism and collaboration as a result of the professional development they received using the train-the-trainer model.

One such study in Arizona examined the use of the train-the-trainer model, using the incorporation of student formative assessments in an effort to measure the impact. The training that was provided was collaborative, job-embedded, ongoing, and adaptable in

order to meet the requirements of a School Improvement Grant. A mixed-methods design was used to measure quantitative and qualitative results. The research question examined the influence of train-the-trainer professional development on classroom instruction as measured by the use of student formative assessments in an effort to measure the impact (Pollnow, 2012). The researcher used surveys and observations to determine the effect of the professional development as perceived by both the trainers and the teachers who participated. The researcher also measured the amount of formative assessments used by teachers after the professional development was given as opposed to teachers who did not participate (Pollnow, 2012). In the case of the qualitative study, the professional development was perceived as effective by the trainers but not as effective by the teachers (Pollnow, 2102). The number of formative assessments did increase significantly more for those teachers who participated in the professional development as opposed to those who did not participate (Pollnow, 2012). As with other research, no specific analysis was conducted to measure student achievement as a result of the professional development. In the absence of research it can only be assumed that a more efficient use of variables such as the use of formative assessments, increased learning goals, and teacher professionalism are all contributing variables to increased student achievement.

In conclusion, the proposed investigation will add to the paucity of existing research examining the impact of the teacher-leader model of professional development using measures of student achievement. As stated, there is a limited quantity of research that has measured the effects of teacher-leaders on student achievement. This investigation will provide school leadership with a model of how to use available empirical evidence to help them make informed decisions about programs that will affect

the achievement, culture, and overall success of school. This research will also benefit the MCESC as well as all ESCs in Ohio and in other states. ESCs are continually evolving into service oriented organizations and state governments are continually decreasing subsidized funds to ESCs and statutory requirements that limit districts in their ability to choose an ESC. The current investigation can provide a model of how data can be used to show the worth and value of programs, as well as provide information for program improvement. This approach to evidence-based services is imperative to provide credibility and evidence to assist districts in choosing services that will best facilitate their students' needs. It will also increase awareness of the roles ESCs play in improving the quality of education to legislators charged with determining funds available for the necessary work and services ESCs provide.

Chapter III

Method

Chapter three will highlight the methods used to gather and analyze data. It will describe the participants used in the study as well as the criteria used to sort each district for comparisons and correlations. Chapter three will also describe the types and levels of metrics for the information used in the current investigation, including descriptions of the data as it were accessed from the various state level portals. Lastly, the procedures for the intervention are discussed.

Participants

The participants in the current investigation included fourth through eighth grade teachers from the various school districts in Mahoning County and surrounding counties. The subject areas taught included math and language arts. The districts that participated were Austintown, Beaver Local, Boardman, Campbell, Canfield, Columbiana, Girard, Jackson-Milton, Lowellville, Poland, Sebring, South Range, Springfield, Struthers, West Branch, Western Reserve, and Youngstown City. Teachers from four of the districts were considered to be members of the control group, in that they were not included in the professional development. Teachers from the other 13 districts participated in at least one of the professional development offerings.

Districts that participated in the teacher-leader model were assigned values ranging from T1 through T13. The districts that did not participate were assigned values ranging from C1-C4. Descriptions of the districts used in this study are included in the table. Districts are classified by type, (rural, suburban or urban, treatment or control

indicated with a “T” or “C”), enrollment (number of total students grades k-12), disadvantaged pupil population (the number of students who qualify for free lunch), mobility (the percentage of students in the district for less than one year), and race (the percentage of non-Hispanic White students). This information is provided in Table 1.

Table 1

District Information

District	Type	Enrollment	Disadvantaged	Mobility	Race
T1	Suburban	5285	47%	6.7%	82%
T2	Urban	1211	82%	14.6%	40%
T3	Suburban	2804	14%	3.1%	93%
T4	Suburban/Rural	1036	37%	6.8%	94%
T5	Suburban/Rural	850	47%	6.1%	97%
T6	Suburban	607	43%	2.6%	91%
T7	Suburban	2163	1%	3.6%	95%
T8	Suburban/Rural	584	62%	12.8%	95%
T9	Suburban/Rural	1214	26%	4.4%	98%
T10	Suburban/Rural	1093	35%	5.6%	97%
T11	Suburban/Urban	1973	61%	8.4%	84%
T12	Suburban/Rural	2206	37%	7.0%	97%
T13	Rural	718	28%	5.4%	97%
C1	Rural	1953	41%	7.7%	97%
C2	Suburban	4530	42%	8.3%	77%
C3	Suburban/Urban	1735	59%	6.9%	84%
C4	Urban	5239	99%	21.1%	15%

Student data in those districts were derived from those fourth through eighth graders who had taken the Ohio Achievement Assessments in reading and math during the 2013 administration.

Instrumentation

Appendices D and E show the schedule of meetings and the activities that were performed on those dates. The professional development was delivered to teachers by grade level bands/subject areas as follows:

- 4-5 grade language arts/ teacher-leaders;
- 4-5 math/ teacher-leaders;
- 6-8 language arts/ teacher-leaders; and
- 6-8 math/ teacher-leaders.

The professional development began in December 2011 and concluded with a reflection and evaluation in January, 2014. The assessments used for elementary student test scores were the Ohio Achievement Tests given in spring 2013. The tests used were as follows:

- 4^{th} grade reading and math;
- 5^{th} grade reading and math;
- 6^{th} grade reading and math;
- 7^{th} grade reading and math; and
- 8^{th} grade reading and math.

Traditionally, data from these assessments are collected and used to measure student achievement at that grade level and for that particular subject. Accountability measures for the school and district are also measured based on the results from these tests.

Recently, value-added data have been added as part of the accountability measures now used to measure the effectiveness of the classroom teacher and grade level as a whole. Value-added analysis is a statistical method that helps educators measure the impact schools and teachers have on a student's academic progress rates from year to year. Each district receives a score for each grade based on a calculation that measures each student's growth. Value-added scores are used in Ohio's new Teacher Evaluation System and is an integral part of the accountability system in Ohio. The value-added scores that were used in this study were retrieved from each district's local report card. The report cards provide value-added ratings for each grade level.

Value-added psychometric information is relatively guarded information by the Ohio Department of Education. Investigation into possible models used in generating value-added numbers reveals that there are multiple models used (Wright, 2010). In general, all forms of the value-added models take one of two forms: the Multivariate Response Model (MRM) or the Univariate Response Models (URM). The MRM is a multivariate repeated measures ANOVA model. The URM is a traditional ANOVA model. The data provided can be used to predict scores on tests the students have yet to take (Wright, 2010). Currently, in Ohio, math and reading value-added scores are calculated using the MRM method which compares the average growth of students in the most recent year to the average growth of students in 2010, which is the state's baseline year. The growth expectation is defined as maintaining placement in the distribution of normal cure equivalency (NCE) scores from one year to the next (Meade, 2013). NCE is similar to a percentile rank in that scores are derived from scaled scores and ranked based upon performance and is an equal interval scale, different from a percentile rank (Meade,

2013). Value-added scores used at each grade level are calculated by using a multi-year average composite of up to three years. The score is calculated by dividing the mean gain by the standard error at each grade level. A growth index is calculated by dividing the estimated gain by the associated standard error and a letter grade is given to each grade level based upon the gain index (Meade, 2013). There is currently debate at the state level as to whether the information should be used to evaluate teachers or be used solely to predict student achievement.

Procedures

Professional development intervention. The teacher-leaders chosen committed to three days of professional development involving in-depth standards as well as strategies for working with colleagues on implementation of the standards. They were also responsible for developing a plan with building or district administration for implementation of the standards. The teacher-leaders chosen received professional development opportunities, resources to assist with implementation, and the ability to participate as part of the Teacher-Leader Endorsement cohort (Appendix A). Instructional consultants from the MCESC received training in Common Core State Standards for each subject area and by grade level from the ODE. The Ohio Standards for Professional Development were employed to deliver the professional development to the teacher-leaders. There are six standards that are considered best practice:

- Purposeful, structured, and continuous process that occurs over time;
- Informed by multiple sources of data;
- Collaborative;

- Varied learning experiences that accommodate individual skills;
- Evaluated by short term and long term impact on student achievement; and
- Results in acquisition, enhancement, or refinement of skills and knowledge. (ODE, 2007)

Teacher-leaders were selected from each school district, from each grade level, and subject to participate in the MCESC teacher-leader model of professional development for Common Core State Standards for math and language arts. The purpose of the model is to build capacity for implementation of the Common Core State Standards. The teachers chosen to participate in the leader portion of the development were suggested based on their ability to:

- Know and demonstrate skill in evidence-based principles of effective leadership and teacher learning;
- Promote the use of data-based decisions and evidence-based practice;
- Facilitate a collaborative learning culture;
- Participate in developing and supporting a shared vision and clear goals for their schools; and
- Promote and model ongoing professional learning and improved practice within a learning community.

The sessions began in December of 2011 and are scheduled to continue with a reflection and evaluation in January 2013.

Additional considerations were taken into account such as longevity, willingness to attend and participate in scheduled meetings, and willingness to communicate with

MCESC consultants. The control participants included those teachers and students from districts that did not participate in the professional development.

The instructional consultants worked in teams of two to provide the professional development which consisted of three separate days for math and four separate days for reading lasting from 8:30 a.m. to 3:00 p.m. each day. There was also a professional development opportunity for principals of all district buildings involved in the implementation process and suggestions for efficient and effective professional development to allow the teacher-leaders to train other staff. Examples of the activities provided are located in Appendices F and G.

The control group participants received professional development typically through limited group time that was spent doing gap analysis between the Ohio standards and the new Common Core State Standards. Control group schools indicate that this generally occurs during teacher planning periods.

Teacher-leader delivery. Districts in the treatment group used various methods for the teacher-leaders to train teachers in their respective districts. As stated earlier, principals engaged in discussions about effective methods used by the teacher-leaders. The consensus among principals and teacher-leaders was that the leaders were given release time on different occasions throughout the school year to train staff. Grade level and subject area meetings were held. Districts also held professional development waiver days, granted by the ODE, to allow leaders to train other staff. Teacher-leaders were also given the opportunity to provide 15 hours of professional development for Common Core State Standards outside of the school day. Although the delivery of the professional

development by each teacher-leader took place in a variety of forms, this varied delivery potentially enhances the external validity of this investigation.

Data Collection and Organization

Data were collected from each district by accessing the statewide test site located on the webpage of the ODE. The data are public record and readily available, however, all district leaders were informed of the research and the methods for collection of data were approved. Usernames and passwords to access district data on the statewide test site were made available. The data were downloaded into Excel spreadsheets and then exported into SPSS.

Value-added data were obtained by accessing district data from the interactive local report cards located on the ODE website. Each district was given a value-added overall score and each grade level was also highlighted on the report card. The value-added data were listed as:

- 2.0 and up = A
- 1.0 to 1.9 = B
- -1.0 to .09 = C
- -2.0 to -1.1 = D
- Below -2.0 = F

Individual teacher value-added scores were not used for analysis. The data were not consistently available for each of the districts used in the study. The data that were available, specifically related to individual teachers, were inconsistent because the data reflected up to three years per teacher depending on the amount of time that particular

teacher had taught the grade/subject. In many cases, teachers at the middle school level have multiple students from various classes during the day.

Chapter IV

Results

Data were collected by obtaining test results from all the districts used in the study via the statewide testing site located on the ODE website. Once the data collection was completed, the results were downloaded into Microsoft Excel spreadsheets and then imported and analyzed using SPSS Version 18. Also, value-added data for each district were obtained by accessing the districts' local report cards via the ODE website. That data were then transferred into Microsoft Excel spreadsheets and imported and analyzed using SPSS Version 18. Student level data were available for both reading and mathematics achievement across both the treatment and control groups. However, only grade level data were available for reading and mathematics value-added data across both the treatment and control groups. The information was transferred into a Microsoft Excel spreadsheet and imported and analyzed using SPSS Version 18.

Demographics

The data analysis process began by looking at aggregate values for the treatment and control group across the mathematics achievement scores. Scores were drawn from n = 4850 students attending the control group schools, and n = 8541 students from the treatment group schools. The aggregate mathematic scores are presented in Table 2.

Table 2

Student Achievement Mathematics Data by Group

Group	Mean	SD	Skewness	Kurtosis
Control	418.92	36.3	0.244	0.118
Treatment	429.71	33.63	0.21	0.465

As seen in Table 2, aggregate scores from the treatment group are higher than the aggregate scores from the control group. A similar analysis for reading scores is presented in Table 3.

Table 3

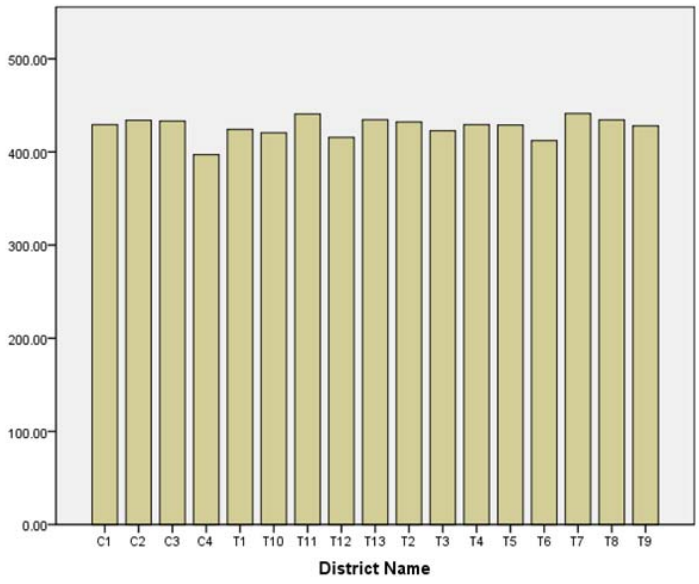
Student Achievement Reading Data by Group

Group	Mean	SD	Skewness	Kurtosis
Control	418.92	28.70	-0.33	0.34
Treatment	428.13	24.95	-0.21	0.46

As seen in Table 3, aggregate scores from the treatment group are higher than the aggregate scores from the control group.

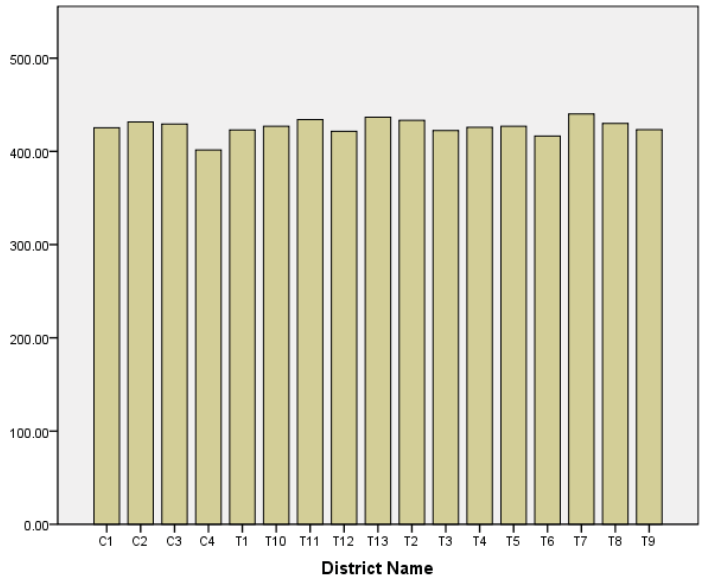
Figure 1 provides a graphical image of each district's mathematics achievement aggregate scores. Visual examination of the mathematics scores reveals a fairly level distribution with low aggregate values represented by both groups (C4, T12, and T6).

Figure 1. Average Mathematics Scores by District



Visual examination of the reading achievement scores reveals a similar pattern of level distribution with low aggregate values represented by both groups (C4, T12, and T6), seen in Figure 2.

Figure 2. Average Readings Scores by District



In deeper exploration of the scores, data analysis examined the reading and math scores' values by grade level, across the two groups. The mathematics aggregate data are presented in Table 4.

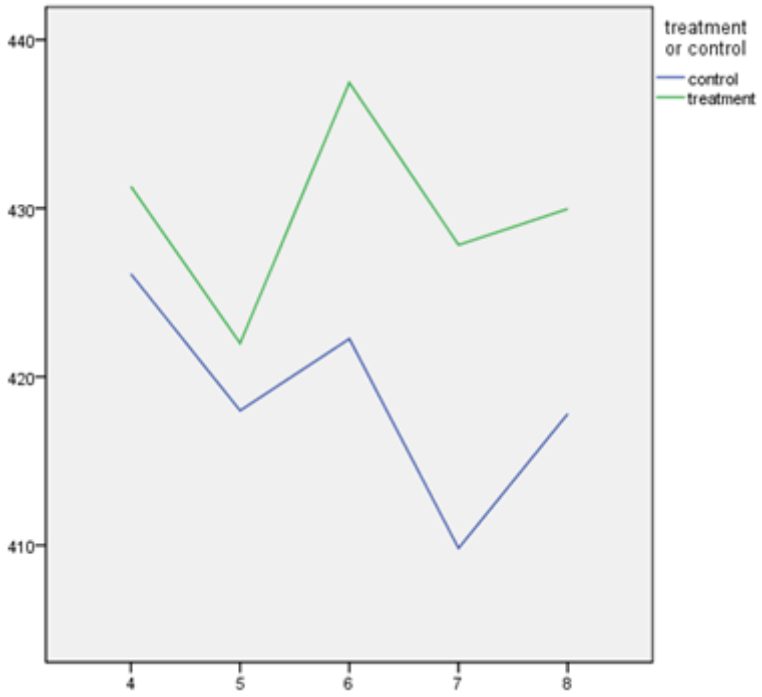
Table 4

Student Math Achievement by Grade

Grade	Group	Mean	SD	Skewness	Kurtosis
4th	Control	426.10	34.20	-.02	.41
	Treatment	431.29	32.10	.26	.86
5th	Control	417.99	36.25	.22	.55
	Treatment	421.98	34.69	.19	.35
6th	Control	422.25	41.46	.26	-.25
	Treatment	437.46	38.76	.13	.36
7th	Control	409.83	32.20	.35	.05
	Treatment	427.82	31.24	.14	-.40
8th	Control	417.80	33.49	.29	-.11
	Treatment	429.96	29.02	.17	.39

As seen in Table 4, treatment group scores are higher than their control group counterparts when examining student level data by grade. A graphical depiction of these results is provided in Figure 3.

Figure 3. Graphical Image of Mean Mathematics Scores (vertical axis) Across Treatment and Control Groups by Grade Level (horizontal axis)



The reading aggregate data are presented in Table 5.

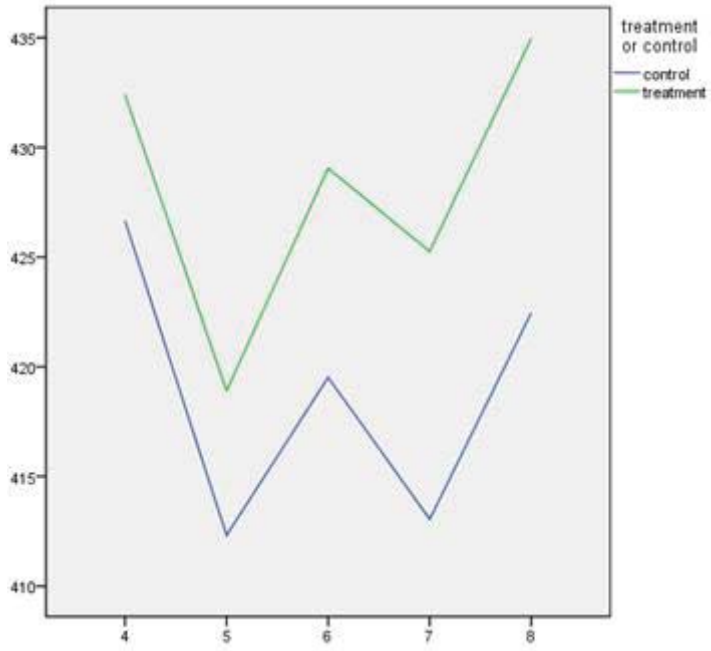
Table 5

Student Reading Achievement by Grade

Grade	Group	Mean	SD	Skewness	Kurtosis
4th	Control	426.67	24.61	-.63	.68
	Treatment	432.41	21.43	-.44	1.55
5th	Control	412.31	27.82	-.37	-.03
	Treatment	418.90	25.36	-.35	.26
6th	Control	419.52	28.68	-.34	-.34
	Treatment	429.05	24.65	-.17	-.06
7th	Control	413.05	27.77	-.17	-.17
	Treatment	425.26	23.90	-.06	.23
8th	Control	422.46	31.25	-.25	-.23
	Treatment	434.98	25.86	-.12	.32

As seen in Table 5, treatment group scores are higher than their control group counterparts when examining student level data by grade. A graphical depiction of these results is provided in Figure 4.

Figure 4. Graphical Image of Mean Reading Scores (vertical axis) Across Treatment and Control Groups by Grade Level (horizontal axis)



Mathematics and reading achievement data are further broken down to provide aggregate information for each district by grade level and by group. These results are depicted in Appendix A and Appendix B.

Value-added Results

Value-added data are presented for the control group relative to the treatment group in Table 6.

Table 6

Overall Value-Added Score by Group

Group	Mean	SD	Skewness	Kurtosis
Control	-.73	5.75	.45	.51
Treatment	1.28	4.91	.47	-.72

As seen in Table 6, value-added scores are higher for the treatment group than the control group overall. Table 7 depicts reading value-added scores separated by grade level and group.

Table 7

Reading Value-Added Scores by Grade and by Group

Grade	Group	Mean	SD	Skewness	Kurtosis
4th	Control	2.74	1.6	.28	-2.6
	Treatment	.72	2.47	-.15	-.76
5th	Control	-2.23	.94	1.46	1.75
	Treatment	.24	1.40	.16	-.96
6th	Control	-1.55	5.03	.22	1.76
	Treatment	.16	1.86	.29	-1.24
7th	Control	-2.28	3.2	-1.02	1.95
	Treatment	-1.79	2.58	.12	-1.47
8th	Control	.29	3.36	1.45	1.66
	Treatment	.33	2.37	.36	-.44

As seen in Table 7, reading value-added scores are fairly consistent among grade levels. The treatment group scores are higher for fifth through eighth grade.

Table 8 depicts math value-added scores by grade level and by group.

Table 8

Math Value-Added Scores by Grade and by Group

Grade	Group	Mean	SD	Skewness	Kurtosis
4th	Control	.22	4.77	.24	-2.22
	Treatment	-.76	4.06	-.46	.53
5th	Control	-3.38	7.73	-1.28	2.44
	Treatment	.51	4.06	-.73	-.19
6th	Control	-3.09	7.73	-1.28	-3.95
	Treatment	.23	7.04	.72	-.39
7th	Control	.43	.85	1.73	2.92
	Treatment	1.51	4.23	-.45	-1.3
8th	Control	7.06	8.70	.16	-5.08
	Treatment	2.57	5.40	1.16	1.04

Math value-added scores by group reflect much the same as reading scores. The treatment group scores reveal higher mean scores in the fifth through eighth grades, with fourth grade being the exception. Likelihood analyses were conducted and provide evidence that the treatment scores are significantly higher than control group scores for the overall value-added data, $p = .06$, $\alpha = .10$. Appendix C depicts value-added scores for reading and math by group, grade, and district.

Preliminary Analysis

Zero-order correlations were analyzed across all potential dependent variables in order to assess the relationship between them. The dependent variables for the current investigation include reading value-added scores, mathematics value-added scores, reading achievement aggregate scores, and mathematics achievement aggregate scores. These results are presented in Table 9.

Table 9

Zero-Order Correlation of Dependent Variables

	1	2	3	4	5
Overall(1)	1	.275*	.370**	.204	.297**
ReadVA(2)		1	.366**	.325**	.249*
MathVA(3)			1	.178	.261*
ReadAG(4)				1	.823**
MathAG(5)					1

As seen in Table 9, a large significant correlation exists between aggregate math achievement scores and reading achievement scores, with moderate correlations presenting between the other potential dependent variables. The large significant correlation between the math and reading scores potentially creates a multicollinerity issue. Additional zero-order correlations were examined between potential independent variables on dependent variables. These results are presented in Table 10.

Table 10

Zero-Order Correlations of Independent and Dependent Variables

Variables		2	3	4	5	6	7	8	9
Overall Value-Added	1	.275*	.370**	.204	.297**	-.018	-.365**	-.168	.204
READ VA	2	1	.366**	.325**	.249*	-.143	-.105	-.102	.115
Math VA	3		1	.178	.261*	.070	-.141	-.055	.065
Read AG	4			1	.823**	-.216*	-.710**	-.707**	.632**
Math AG	5				1	-.146	-.745**	-.713**	.649**
Enrollment	6					1	.193	.315**	-.473**
Disadvantage	7						1	.876**	-.790**
Mobility	8							1	-.853**
Race	9								1

*. Correlation is significant at the 0.05 level (2-tailed).

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

As indicated in Table 10, large significant correlations exist between disadvantage, mobility, and race. Notably, the correlations between the value-added dependent variables and the independent variables are predominantly small and negative, while correlations between the achievement scores and the independent variables are predominantly large, negative, and significant.

Based on the zero-order correlations and the research questions being examined, three possible approaches to data analyses are viable: Analysis of variance (ANOVA), Discriminate function analysis (DFA), and Multivariate analysis of variance (MANOVA). DFA is not being used because aggregating data has reduced the sample size to $n = 85$, therefore restricting power β (Tabachnick & Fidell, 2009). ANOVA can be

used to assess group differences with each dependent variable independently, however, performing multiple ANOVAs will potentially inflate Type I error. Additionally, ANOVA will negate the ability to highlight the overlap of the dependent variables' potential impact on group membership (Field, 2009). MANOVA can provide the power to detect group differences across the dependent variables while also assessing the impact of each dependent variable (Field, 2009).

Assumptions

In an effort to assess the viability of MANOVA for the current investigation, it is necessary to test a number of assumptions: linearity, homogeneity of variance, homogeneity of covariance matrices, and homoscedasticity (Field, 2009). Curve estimation is used to assess the linearity of each dependent variable across group membership. Linearity was found to be tenable across all dependent variables, $p < .05$.

Homogeneity of variance was assessed using Levene's test of equality of error variances. Results were found to be tenable for overall value-added and math value-added, however, were found to be untenable for reading value-added, math achievement, and reading achievement. According to Tabachnick and Fidell (2009), this violation will not present an issue for MANOVA analyses with error $df > 20$.

Homogeneity of covariance matrices was assessed using the Box's test of equality of covariance matrices. Results were found to be tenable for both reading values (Box's *M*: $F[6, 7449.56 = 1.984, p = .064]$) and math values (Box's *M*: $F[6, 7449.56 = 1.848, p = .086]$).

Homoscedasticity was assessed by analyzing scatterplot of standardized residual values across standardized predicted values as recommended (Tabachnick & Fidell, 2009). Homoscedasticity was found to be tenable.

Primary Analysis

Initially an independent samples *t* test was used to examine group differences across math achievement and reading achievement with student level data. These analyses reveal significant differences across groups for both mathematics achievement, t (9450.33) = -17.31, p <.001, CI_{95}[-12.035, -9.541], and reading achievement, t (8943.18) = -18.76, p <.001, CI_{95}[-10.29, -8.29], making needed adjustments to degrees of freedom. These results suggest student achievement in the treatment group was significantly higher for both reading and math relative to control group achievement.

Two separate MANOVA models were analyzed, one for reading scores and one for math scores. This approach to analysis is suggested by Cole, Maxwell, Arvey, and Salas (Field, 2009, p.586) which indicates that MANOVA models perform best when dependent variables are only moderately correlated. As seen above, math achievement is highly correlated with reading achievement. Therefore, the analysis is being conducted with reading value-added and reading achievement in Model 1 and math value-added with math achievement in Model 2. The overall value-added was found to be moderately correlated to all dependent variables and will be included in both models.

Model 1: Multivariate analysis of variance revealed no differences across groups for the reading measures, $F(3,81) = 1.986$, $p = .123$. Test of between-subjects-effects revealed significant differences across groups on reading achievement, $F(1,83) = 4.70$, p

= .033. No differences were found across groups on reading value-added or overall value-added scores.

Model 2: Multivariate analysis of variance revealed no differences across groups for the math measures, $F(3,81) = 1.169$, $p = .327$. Test of between-subjects-effects revealed no significant differences across groups on math achievement and math value-added.

Summary

Chapter four examines the student level and grade level achievement data and grade level value-added data, across treatment schools and control schools. Descriptive analysis reveals that achievement scores from the treatment group are higher than the control group in reading and math. Similar results are found when examining data from achievement scores broken down by grade level; achievement scores from the treatment group by grade level are higher than scores from the control group in both reading and math. Similar results also exist when examining value-added scores. Overall value-added scores are higher for the treatment group than the control group. Descriptive analysis reveals that value-added scores in reading and math are higher for the treatment group in most grade levels than the control group.

Zero-order correlations were examined across grade levels revealing that a significant correlation exists between aggregate math achievement scores and reading achievement scores. Moderate correlations exist between the potential dependent variables.

Finally, MANOVA was used to detect group differences across the dependent variables. A number of tests were used to assess the viability of MANOVA. Separate

models were used and both indicated no differences across groups when examined with the multivariate dependent variables combining the two mathematics measures and the two reading measures.

Chapter V

Discussion

Chapter five summarizes the findings from the investigation into the effects of the teacher-leader model of professional development on achievement scores. Specific topics derived from the research include a re-examination of the research questions, summary of the findings, limitations, future research, and concluding thoughts.

Initial Research Questions

The MCESC provides professional development for its member districts mainly for teaching and learning initiatives that have either been mandated by state and federal agencies or for training district personnel on best practices intended to improve student achievement. Educational Service Centers (ESC) across the state have unique approaches to the delivery of professional development. It is important for ESCs to accurately measure the effectiveness of the delivery systems and to constantly improve maximizing the effect resulting in greater gains in student achievement. It is for this purpose that this research was chosen. The study shows the impact on student achievement and value-added scores of the teacher-leader model of professional development used to train teachers on Common Core State Standards. The results can be used to evaluate the MCESC practices in delivery of professional development, particularly when training teachers and helping districts implement new practices. The results can be further used to help other ESCs across the state in choosing professional development models. Because there is little known about the effectiveness of models used by states to implement

Common Core State Standards (Center, 2013), this research could also be used at the state level in determining recommended models to be used in implementation.

Summary of Findings

As stated earlier, most of the research conducted regarding the teacher-leader model is related to qualitative evidence that links increased student achievement to improved culture created by peer-led professional development. One Arizona study used results from student formative assessments to measure impact. In this case, a mixed method design was used to measure quantitative and qualitative results. The research questions were similar to this research (Pollnow, 2012). In the Arizona study, the number of formative assessments increased for those teachers who participated in the teacher-leader professional development (Pollnow, 2012). There is no specific research on the correlation between formative assessments and increased achievement although it can be easily assumed that increased formative assessments would be beneficial in allowing teachers to provide more informed and individualized instruction resulting in higher achievement.

This research examined student achievement and value-added scores in reading and math for grades four through eight in 17 districts throughout Mahoning, Columbiana, and Trumbull counties. Thirteen districts were used in the treatment group and the remaining districts were included in the control group. The treatment group consisted of districts that participated in the professional development provided by the MCESC using the teacher-leader model of delivery. The control group included the districts that did not participate. The dependent variables of student achievement scores and value-added

scores were the measures of the effects. The overall student sample size was n = 13,391, from n = 17 schools. Scores were drawn from those students in both reading and math. The results reveal that there is a significant increase in mean scores in reading and math among the treatment group compared to the mean scores of the control group. However, when math and reading scores are examined by grade level, district, and group, results reveal that there are no significant pattern differences in scores for both reading and math across both groups.

Research does suggest that use of the teacher-leader model, which increases the positive achievement variables such as culture and self-efficacy, does impact student achievement (Pollnow, 2012). This is the first known study that specifically demonstrates the impact that professional development through the teacher-leader model is associated with higher achievement. The results of this investigation support Pollnow's conclusions.

In this investigation, a positive and significant correlation exists between math and reading achievement scores. Research exists that explains correlations between math and reading scores. Most research suggests a correlation exists (Larwin, 2010). There is research that suggests the correlations are not as significant as one might assume (Villa, 2008).

Value-added scores yield similar results to achievement scores. Overall value-added scores are higher for the treatment group compared to the control group. Results depicted by grade level show higher value-added scores in grades five through eight in reading and math for the treatment group. The fourth grade results are different in reading and math where the treatment scores are slightly lower than the control group.

Possibilities for these results include, but are not limited to, the significance of the recent implementation of the third grade reading guarantee. Schools are now required to implement interventions at the third grade level for those students who are low achieving. If the control group scores are lower than the treatment group scores, this may reflect that more interventions were in place for that group resulting in higher value-added scores as evident with control group C4. The eighth grade math results are also higher for the control group. A possible explanation for this result is that two schools in the control group had abnormally high calculated value-added scores. C1 scored 16.35 and C2 scored 12.57, significantly impacting the average results.

Unlike achievement scores, value-added math scores are not as highly correlated to reading value-added scores. The correlation of math to reading value-added scores in this investigation is moderate, positive, and significant.

There is considerable research regarding correlations between math and reading achievement and other independent variables that may have an effect on achievement (Konstantopoulos, 2013). Independent variables such as income, mobility, and race are highly correlated to achievement. This study also indicates that math and reading achievement scores are correlated to those same independent variables, however the effect is relatively large, negative, and significant. The same correlations do not exist for value-added scores and the independent variables. Those correlations are predominantly small and negative.

Research has determined that correlations exist between reading achievement and math achievement (Larwin, 2010). Usually poor reading ability automatically undermines

a student's likelihood of success in math achievement. (Larwin, 2010). One suggestion for the correlation is that many of the math problems today are structured as word problems in which children must read a scenario and determine the proper procedure for solving, as opposed to a traditional numerical problem such as long division or multiplication tables. In the case of word problems, there are more reading skills that need to be utilized than mathematical skills, thus creating the correlation. Other research, such as the study conducted in Indiana, found a correlation between improved reading and math scores after teachers implemented a new system of interim assessments (Konstantopoulos, 2013). The study showed when increases in reading were shown after treatment, they usually occurred in math as well (Konstantopoulos, 2013).

Two separate MANOVA tests were conducted due to the sample size reduction, resulting from aggregating data, $n = 85$. The reduced sample size and the number of variables made MANOVA the most appropriate method. The multivariate results reveal no differences across groups for the reading measures. However, tests of between-subjects-effects revealed *significant* differences across groups in reading achievement; no differences were found across groups on reading value-added or overall value-added scores. The second MANOVA results reveal no differences across groups for all math measures including achievement and value-added scores. While MANOVA provided a mechanism to conduct a more powerful analysis, the limited sample size, $n = 85$, likely limited the results from showing significant outcomes.

Limitations

Many contributing variables influence the outcomes of achievement testing. To say that one variable is the sole cause of an outcome is not defendable. Current research suggests that there are many variables that affect achievement (Lewis et al., 2010). For example, efficacy of the classroom teacher and teacher-leaders can positively affect achievement while poverty and mobility can negatively affect achievement. Macro level factors such as economic instability or political influences can also impact achievement. For this reason, directly linking achievement scores to any independent variable has its limitations. The goal of the current investigation is to examine impact, if any, of an ongoing teacher-leader model of professional development that focuses specifically on Common Core State Standards. As such, this investigation simply utilized existing student data from school districts that participated in the intervention. Additionally, matching control group schools were incorporated. No manipulation of the data or selection of the participants occurred. Therefore, the results reflect the differences seen for those who received the intervention as opposed to those districts that did not participate. In this investigation, the independent variables that may have confounded results were relatively balanced across both the control and treatment groups.

Second, there are limitations to using test scores as a measurement of an indirect intervention, such as events that occur outside the classroom that might impact one aspect of the educational process. Additionally, while test scores are not the best measure of student achievement, currently, they are generally accepted for accountability and measurement (Bell, Wilson, Higgins, & McCoach, 2010). According to Thomas (2013), it is rare to connect student achievement to interventions that are not directly delivered to

students. However, the current investigation was, in fact, able to demonstrate a link between an indirect intervention and differences in student achievement via test results.

Similarly, the impact of this professional development delivery system on student achievement at this time may have been mitigated by the educational climate with favorable results. Over the past two years an educational reform initiative in Ohio known as the Ohio Teacher Evaluation System (OTES) was implemented and mandatorily included in each teacher's evaluation. Because OTES uses student achievement as an indicator of effectiveness, it is in the teacher's best interest to implement any strategy that would positively influence the achievement of students. Subsequestly, teachers were more likely motivated to implement the Common Core State Standards, the focus of the intervention provided by the MCESC, in an effort to raise achievement.

Third, in this investigation districts C4 and T2 are relatively matched demographically. However C4 does present some unique political and cultural climates that inhibit abilities to raise student achievement. These conditions are reflected in their data used in this investigation. Currently C4 has implemented a plethora of programs intended to raise achievement levels without much success. However, as indicated by the outcomes in the current investigation, C4 demonstrated gains in value-added beyond districts in the control and treatment groups. Likewise, T2, which is demographically similar to C4 also showed similar positive patterns in achievement as the other treatment group districts. Also, C4 and T2 had similar value-added data.

Potential Contributions

The ODE awarded the MCESC a grant to implement Ohio's Common Core State Standards as part of Ohio's RTTT initiative. Research was conducted by the MCESC previous to writing the grant application to determine the most effective way to deliver professional development for the implementation of the CCSS to the districts in Mahoning County. After much research, it was decided that the teacher-leader model would be the most cost effective and the most efficient means, educationally, to deliver the professional development. There is limited research about the effect of the teacher-leader model directly related to student achievement. This investigation is the first of its kind. The contribution of this research will benefit educational entities that are in the decision making process as to which model of professional development would be most effective in relation to raising student achievement. Timely, ongoing, and effective professional development will be instrumental in implementing the standards (Center, 2013).

The MCESC currently does not have an active process for measuring the effect of programs such as professional development. Information regarding the effectiveness of the programs it has to offer would be beneficial for internal evaluation and for those entities such as school districts that are seeking effective programs that will raise student achievement. Based on the results of this investigation, the MCESC was effective in providing professional development for the school districts that participated. Also based on the results, there are opportunities for the MCESC to improve the model and add components to provide a better investigation and evaluation such as a qualitative type of feedback from teachers who participated regarding the model and the implementation

within the school districts. That type of information would allow for more in depth analysis of other independent variables that might have an effect on the outcomes and would provide the evidence needed to most effectively improve the ongoing professional development delivery.

The Ohio Department of Education released the applications for implementation of CCSS in August 2011. Currently, there is no research available that measures the effectiveness, as a whole, on the implementation of CCSS across the state of Ohio. Brand new statewide assessments are scheduled for release in 2015 and will completely align to CCSS. It would be a benefit for ODE to measure school readiness regarding the new standards by evaluating the professional development that has been used. It would be beneficial for the state to recommend or award entities that use the most effective models for the professional development used.

The Race to the Top Initiative and the movement to implement new Common Core State Standards has been in effect for three years. There is little known on a national level about the aspects of professional development related to the CCSS, including which entities are responsible for providing it, what kinds of professional development are being offered, how many teachers and principals have received training to date, and what challenges states are confronting as they try and meet this need (Center 2013). The Center on Education Policy (CEP) at the George Washington University releases surveys to state superintendents and their deputies regarding the professional development used in the implementation of the CCSS (Center, 2013). The CEP conducted three surveys since 2010 when the CCSS were first introduced. The findings of the surveys were as follows:

- More than half of the states surveyed, a majority of K-12 teachers of math and ELA, have participated in at least some CCSS related professional development but fewer states report that a very large proportion of their educators have been served;
- States, school districts, and other entities are providing CCSS-related professional development services for teachers and school principals;
- States are providing various types of professional development on the CCSS; and
- The majority of states reported major challenges in providing CCSS-related professional development (Center, 2013).

As seen by studies, many states are facing challenges in the implementation of CCSS and as assessments are continually introduced and more accountability is related to the outcomes, it is paramount that the services delivered for professional development are of high quality (Center, 2013). Investigations such as this will be helpful in ensuring entities of that quality.

Future Research

The limitations presented earlier were meant to caution any assumptions that this investigation proves the value of the intervention. There are possible adjustments that could be implemented to further investigation that could strengthen the internal and external validity of an investigation such as this.

A year-over-year analysis of test scores and value-added scores would lessen the impact of some of the independent variables such as mobility and strengthen the power by adding more scores.

Initially, in this investigation, value-added scores for each teacher were going to be used to strengthen the power of the MANOVA. This is the first year that individual teacher value-added scores have been calculated and reported as part of evaluations and accountability. As a result, there are inconsistencies in the calculations of value-added scores for each teacher. Because of the inconsistencies, teacher value-added data would have weakened the internal validity of this investigation had they been used. An investigation that would use individual teacher value-added data would provide for a clean analysis of each teacher who participated in the treatment group and those who might not have participated, yet, their scores are included in the treatment group.

Along the same lines, fidelity of delivery on the teacher-level or school-level implemented the CCSS after receiving the professional development is not measured. A qualitative study that coincides with this investigation regarding the implementation process of the teacher-leader model that measures the attitudes of the teachers and administrators who participate would also add a variable that would be interesting to measure its impact. Such an investigation would also provide some insight into the fidelity of the implementation process.

Lastly, as indicated by the study conducted by the CEP at George Washington University, there are many different models of professional development that are being utilized to deliver CCSS professional development. An investigation that compares the similar achievement scores and value-added scores based on the professional development model used would lend insight into the most efficient model.

Conclusion

Continual research into the effects of programs on student achievement is paramount particularly in this era of educational reform. Public scrutiny regarding education has increased rapidly over the years. Initiatives like NCLB, RTTT, and CCSS are meant to increase student achievement to help our nation compete in a global society. The true measures of effectiveness are conducted using scientific research. Stakeholders in education need to be able to evaluate programs, initiatives, and the effectiveness of schools in general to be able to make good decisions that will affect student outcomes. It is my hope that this investigation contributes to that process.

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Appendix A

Student Achievement in Math by District, by Grade and by Group

Group	District	Grade	Mean	SD	Skewness	Kurtosis
Control	C1	4th	438.84	32.79	0.55	1.36
		5th	423.52	31.98	0.38	0.97
		6th	429.83	37.95	0.07	-0.61
		7th	416.71	30.87	0.48	0.45
		8th	437.73	31.01	0.81	0.48
Control	C2	4th	437.17	30.87	0.2	0.08
		5th	425.55	34.06	0.41	0.4
		6th	444.84	37.7	0.06	0.4
		7th	429.64	29.6	0.15	0.46
		8th	432.7	29.25	0.17	0.05
Control	C3	4th	437.17	26.07	0.05	-0.04
		5th	441.17	33.77	0.39	0.13
		6th	432.93	31.02	-0.9	0.59
		7th	423.46	29.64	0.5	0.52
		8th	427.87	28.1	0.36	0.9
Control	C4	4th	406.92	31.77	-0.18	-0.16
		5th	398.93	31.48	-0.16	0.36
		6th	395.72	33.87	0.92	1.52

		7th	390.18	24.95	0.34	0.33
		8th	393.56	23.85	0.41	0.33
Treatment	T1	4th	424.93	28.15	0.15	0.3
		5th	415.7	34.4	0.07	0.29
		6th	431.4	39.32	0.15	0.13
		7th	423.6	31.4	0.16	-0.62
		8th	425.9	28.81	0.11	0.19
Treatment	T2	4th	409.17	31.02	0.37	0.44
		5th	406.09	28.21	0.32	-0.21
		6th	422.77	38.74	0.41	-0.23
		7th	408.87	26.28	0.43	0.18
		8th	414.15	29.63	-0.11	-0.74
Treatment	T3	4th	444.93	31.35	0.38	0.23
		5th	436.36	35.46	0.23	0.54
		6th	455.5	37.14	0.51	0.88
		7th	436.68	29.88	0.18	-0.19
		8th	443.02	29.76	0.33	0.48
Treatment	T4	4th	432.51	28.93	0.37	-0.18
		5th	416.01	30.74	0.02	-0.4
		6th	451.01	35.96	0.14	1.07

		7th	433.67	30	0.66	-0.12
		8th	438.9	24.23	0.18	0.71
Treatment	T5	4th	430.13	29.21	-0.07	0.92
		5th	428.42	33.14	0.12	1.32
		6th	430.79	37.48	-0.27	-0.07
		7th	422.87	33.85	0.17	-0.21
		8th	428.15	25.03	-0.11	0
Treatment	T6	4th	411.15	20.35	-0.21	-0.77
		5th	409.17	29.39	0.1	-0.96
		6th	433.63	33.61	0.5	-0.46
		7th	429.62	29.01	0.67	1.92
		8th	419.19	21.67	0.51	0.04
Treatment	T7	4th	445.29	32.21	0.75	0.99
		5th	434.7	37.44	0.47	0.46
		6th	457.91	37.27	0.28	0.79
		7th	430.39	29.24	-0.1	-0.48
		8th	435.54	27.8	-0.02	-0.48
Treatment	T8	4th	428.15	32.06	0.07	-0.38
		5th	417.52	33.84	-0.52	0.1
		6th	404.14	34.09	-0.07	-0.57

		7th	414.84	30.6	0.24	-0.45
		8th	413.89	33.29	-0.03	-0.44
Treatment	T9	4th	448.95	32.12	0.63	0.93
		5th	428.4	33.89	-0.46	0.72
		6th	435.68	30.5	-0.22	-0.26
		7th	435.75	31.19	-0.23	0.04
		8th	424.31	29.31	0.87	1.38
Treatment	T10	4th	433.65	28.55	0.12	-0.15
		5th	426.33	30.17	-0.25	-0.37
		6th	440.58	37.33	-0.39	0.08
		7th	435.44	27.23	0.48	-0.06
		8th	425.4	23.93	-0.1	-0.57
Treatment	T11	4th	421.19	30.42	-0.1	-0.57
		5th	416.04	31.68	0.18	0.67
		6th	425.37	32.23	-0.23	-0.19
		7th	425.61	33.35	0.16	-0.74
		8th	425.59	27.5	0.31	0.46
Treatment	T12	4th	430.16	35.08	-0.03	0.47
		5th	417.64	34.31	0.35	-0.13
		6th	435.11	37.34	-0.26	0.33

		7th	430.68	31.23	-0.03	-0.77
		8th	433.8	29.43	0.25	0.7
Treatment	T13	4th	429.32	24.57	-0.31	0.42
		5th	426.84	31.29	0.25	0.07
		6th	422.4	28.29	0.29	-0.49
		7th	427.91	28.83	0.19	-0.62
		8th	437.98	24.01	0.11	0.28

Appendix B

Student Achievement in Reading by District, Grade, and Group

Group	District	Grade	Mean	SD	Skewness	Kurtosis
Control	C1	4th	431.29	18.59	-0.47	1.09
		5th	417.33	24.58	-0.09	0.09
		6th	425.08	22.61	0.04	-0.25
		7th	421.77	24.13	-0.24	-0.24
		8th	431.6	24.9	-0.36	0.49
Control	C2	4th	436.03	19.61	-0.34	0.55
		5th	421.47	25.46	-0.63	0.11
		6TH	435.45	24.9	-0.05	0.01
		7th	428.64	22.35	-0.25	0.03
		8th	437.28	25.19	-0.1	1.15
Control	C3	4th	436.75	19.19	-0.25	1.49
		5th	422.13	20.67	-0.36	0.46
		6th	428.22	19.11	0.24	0.5
		7th	422.23	23.24	0.12	0.7
		8th	437.36	25.65	0.12	1.12
Control	C4	4th	412.5	25.1	-0.38	-0.03
		5th	397.28	27.66	-0.21	-0.43
		6th	401.13	26.72	-0.52	2.7

		7th	396.26	23.72	-0.07	0.15
		8th	400.82	27.57	-0.09	0.26
Treatment	T1	4th	430.93	28.15	0.15	0.3
		5th	412.51	26.63	-0.32	0
		6th	423.79	24.94	-0.11	0.31
		7th	419.16	22.71	0.22	-0.08
		8th	425.9	23.92	-0.26	-0.08
Treatment	T2	4th	419.94	23.4	-0.57	0.47
		5th	406.58	24.31	-0.23	-0.4
		6th	418.62	23.66	-0.12	-0.36
		7th	416.71	21.29	-0.12	-0.04
		8th	420.29	28.83	-0.08	-0.18
Treatment	T3	4th	441.83	18.23	0.31	1.4
		5th	433.54	21.24	-0.36	1.68
		6th	441.8	20.8	0.06	-0.08
		7th	435.04	21.77	-0.09	0.91
		8th	448.37	24.46	-0.39	0.94
Treatment	T4	4th	432.94	20.86	-0.65	0.86
		5th	415.68	21.6	-0.26	-0.6
		6th	433.12	24.33	0.13	-0.37

		7th	429.52	25.01	0.26	0.43
		8th	438.58	23.9	0.42	0.52
Treatment	T5	4th	429.13	22.44	-0.05	0.69
		5th	418.02	18.69	0.11	-0.33
		6th	418.05	24.4	0.01	-0.8
		7th	422.48	25.37	0.42	1.42
		8th	428.56	22.43	-0.25	-0.73
Treatment	T6	4th	424.25	21.17	-0.93	1.32
		5th	413.41	21.76	0.2	0.96
		6th	434.02	22.92	0.39	-0.79
		7th	430.27	19.83	-0.42	-0.5
		8th	432.71	23.42	0.55	0.27
Treatment	T7	4th	437.1	17.89	0.46	1.9
		5th	427.84	21.3	-0.35	0.17
		6th	440.01	21.05	-0.44	0.37
		7th	426.9	24.61	0.11	1.98
		8th	438.48	26.54	-0.23	0.93
Treatment	T8	4th	428.15	23.67	-0.52	0.95
		5th	415.14	26.29	0.12	-0.12
		6th	413.42	21.01	0.11	-0.34

		7th	420.25	27.86	-0.15	-0.64
		8th	430.58	25.24	0.09	0.92
Treatment	T9	4th	445.11	19.16	0.54	2.57
		5th	430.03	24.84	-0.39	0.72
		6th	435.02	20.48	0.18	-0.04
		7th	434.59	22.75	-0.55	0.37
		8th	438.41	24.91	0.04	0.47
Treatment	T10	4th	434.7	19.34	0.19	3.54
		5th	425.53	26	-0.73	1.18
		6th	433.39	24	-0.4	-0.23
		7th	432.14	21.04	-0.02	-0.4
		8th	440.74	24.45	-0.33	0.3
Treatment	T11	4th	429.1	22.17	-0.45	0.67
		5th	410.47	24.11	-0.5	0.67
		6th	424.48	25.5	0.04	-0.29
		7th	421.41	23.19	-0.12	-0.61
		8th	426.61	24.98	-0.08	0.51
Treatment	T12	4th	425.98	25.72	-0.8	0.79
		5th	415.11	24.72	-0.3	-0.12
		6th	423.77	23.98	-0.42	-0.35

		7th	424.77	26.02	-0.55	0.26
		8th	439.72	25.01	-0.14	0.69
Treatment	T13	4th	432.86	16.54	0.32	3.17
		5th	420.02	18.77	0.08	-0.8
		6th	422.62	21.48	-0.3	0.21
		7th	421.68	18.71	-0.27	0.12
		8th	437.86	25.4	0.54	0.63

Appendix C

Value-added Scores by, Group, District and Grade Level

Group	District	Grade	Reading	Math
Control	C1	4th	1.08	2.2
		5th	-2.26	-1.59
		6th	4.25	2.33
		7th	-1.42	-0.09
		8th	0.22	16.36
Control	C2	4th	3.44	-2.31
		5th	-2.92	-14.29
		6th	0.9	7.32
		7th	0.97	1.67
		8th	-1.95	12.58
Control	C3	4th	1.83	-4.88
		5th	-2.86	3.97
		6th	-4.62	-12.95
		7th	-1.99	0.28
		8th	5.06	-0.29
Control	C4	4th	4.64	5.88
		5th	-0.89	-1.63
		6th	-6.73	-9.06

		7th	-6.69	-0.15
		8th	-2.17	-0.41
Treatment	T1	4th	-3.34	-9.47
		5th	1.59	2.03
		6th	-2.4	5.02
		7th	-0.73	1.86
		8th	-2.62	2.33
Treatment	T2	4th	2.82	2.86
		5th	-0.19	3.09
		6th	1.88	-2.51
		7th	1.75	5.19
		8th	-0.78	-0.58
Treatment	T3	4th	4.98	1.5
		5th	1.27	-7.8
		6th	1.45	14.1
		7th	-5.11	-1.35
		8th	4.86	14.02
Treatment	T4	4th	2.22	-2.57
		5th	0.76	0.43
		6th	1.46	10.08

		7th	-5.01	-4.81
		8th	-0.125	-0.92
Treatment	T5	4th	-1.55	-2.85
		5th	-1.12	3.81
		6th	-2.04	-2.75
		7th	1.44	4.49
		8th	1.4	4.47
Treatment	T6	4th	-2.23	-4.19
		5th	-1.61	-1.85
		6th	3.24	-1.42
		7th	-4.99	-4.58
		8th	1.55	1.7
Treatment	T7	4th	1.16	6.21
		5th	2.8	3.1
		6th	0.43	7.82
		7th	-3.31	-4.56
		8th	-3.19	1.01
Treatment	T8	4th	1.05	1.62
		5th	0.9	-3.4
		6th	-1.39	-3.05

		7th	0.47	-0.03
		8th	-2	0.32
Treatment	T9	4th	2.41	0.92
		5th	-0.43	-4.95
		6th	-1.27	-9.2
		7th	-3.5	6.15
		8th	-0.74	-4.06
Treatment	T10	4th	0.74	0.35
		5th	0.45	-0.86
		6th	-1.39	-2.96
		7th	1.7	1.69
		8th	-0.82	-3.76
Treatment	T11	4th	3.1	-4.26
		5th	1.57	6.3
		6th	-0.56	-7.2
		7th	-3.02	5.34
		8th	1.05	2.11
Treatment	T12	4th	0.24	2.51
		5th	-1.26	3.49
		6th	2.78	1.18

		7th	-1.54	3.5
		8th	3.53	12.48
Treatment	T13	4th	-2.2	-2.55
		5th	-1.58	3.28
		6th	-0.14	-6.11
		7th	-1.46	6.73
		8th	2.16	4.25

Appendix D

Teacher-leaders

2011-2012

Purpose of Teacher-leaders:

To build building-level capacity for supporting implementation of the revised Ohio Academic Content Standards and Common Core State Standards

Teacher-leaders should possess the capability to develop the following skills:

1. Know and demonstrate skill in evidenced-based principles of effective Institute of Educational Leadership and teacher learning.
2. Promote the use of data-based decisions and evidence-based practice.
3. Facilitate a collaborative learning culture.
4. Participate in developing and supporting a shared vision and clear goals for their schools.
5. Promote and model ongoing professional learning and improved practice within a learning community.

Additional considerations:

1. Longevity
2. Willingness to attend and participate in scheduled meetings
3. Willingness to communicate with MCESC consultants

Teacher-leaders will:

1. Attend three (3) days of professional development involving in-depth standards work as well as strategies for working with colleagues on implementation of the standards.
2. Develop a plan with building (district) administration for implementation of the standards.

Teacher-leaders will receive:

1. Professional development opportunities.
2. Resources to assist with implementation.
3. Ability to be part of a Teacher-leader Endorsement cohort (tentative).

Appendix E

Implementation Plan:

BUILDING (DISTRICT) IMPLEMENTATION

District information	
District and Building:	
Teacher-leaders:	
Grades and/or Contents:	
Details	
What will the venue be for working with all teachers (including special education) in the grade level and/or content? (grade level meetings, waiver days, other)	

Schedule for professional development:	
What support will be needed? (resources, technology, administrative, etc.)	

_____ _____

Signature of Teacher-leader Signature of Teacher-leader

_____ _____

Signature of Principal Date

Appendix F

ELA Teacher-leader Meeting

November 28, 2012

8:30-3:00

Quick Write

How you do feel about change? Teachers' highlights…

-Sometimes necessary.

-Can cause excitement or reluctance.

-Better if we are in control

-Mind stimulating

-Can be frightening.

-Not always a fan.

Initiatives slide is shown, listing all of the "changes" in education currently being promoted. Knowledge often helps alleviate some of the anxiety around change.

Writing Standards Review

Writing Standards 1-3

- First three standards cover the types of writing:
  -opinion, explanatory, narrative.

  -after fifth grade there is a shift from opinion to argumentative (more evidence)

- Lucy Calkins *Pathways to the Common Core*

Writing Standards 4-6

- Cover the production and distribution
- Include technology

Writing Standards 7-9

- Cover Research

Writing Standard 10

- Begins in grade 3
- Writing over time.

Activity: In pairs or at tables… highlight the additions between grade 3-4 and 4-5. Summary:

- More changes from 3-4 than 4-5.
- Standards 1-3 read almost like a rubric. The standards can and should be incorporated into evaluating student writing.
- Teachers must look at the standards from the year before, in order to add competencies to students' writing.
- 90 minutes of ELA is recommended and backed by research.

Some Controversy: Topics for Further Discussion

Third grade Guarantee.

Multi-grade level classroom?

How do teachers prepare students for a fifth grade test if they cannot read fifth grade text?

What do you notice about changes from third to fourth grade standards?

- 1. Must show support for ideas with facts, opinions, reasons, etc. and concrete details.
- What are examples of concrete details? Maybe as evidenced by specific examples, descriptions, sensory words, or quotes. Helping kids get what is in their heads down on paper.
- 2. Addition of multimedia production
- 3. Orienting the reader by establishing a situation.

- 4-6. Loses the "guidance and support" idea. Students working more independently, or in student groups.
- 6. Demonstrate sufficient command of keyboarding skills to type a one page paper in a single setting.
- 7. Research is through investigation.
- 8. Take and categorize notes
- 9. Begins in grade 4. An additional type of writing.
- 10. Begins in grade 3. Same in grade 4.

What do you notice about changes from fourth to fifth grade?

- 8. Summarizing and paraphrasing that information. Using evidence for research.

A Tidbit: Clauses v. Phrases

Clause can stand on its own, with a subject and a verb.

Phrases are work clusters lacking subject and verb combinations.

Another Tidbit: Teaching Grammar

Within Daily Oral Language

Within text bound reading and writing.

Ex: When kids are adding /s/ to everything, teach the difference between possessive and plural. Teach on Demand

Teaching Writing Standards in the Classroom

Activity: In groups of three, Types of Writing: Brainstorm a list of genres that will lend itself to this type of writing. What different kinds of writing can students do? Take a gallery walk and add what you can!

Informative/Explanatory

- Some were general suggestions, and some were specific.
- How to…
- Sequence of events

- Investigations
- Response to non-fiction
- Opinion-steps to
- Research topics: historical figures, inventors, curricular themes

- Directions to solve math problems

Opinion/Argumentative

- Letters to the editor, parent, friend, teacher, principal, B.O.E., official to persuade about…
- Debate
- Journals
- Tie to history or other content

- Movie, book or product review
- Compare themes or point of view in a text.
- Blog
- Twitter
- Response to literature

Narrative

- Journals
- Poetry
- Personal narratives
- Historical narrative
- Imaginative narrative
- Realistic fiction
- Journals
- Responding to Literature
- Author a story from a different point of view.
- Letter writing
- Poetry
- Mystery
- Science Fiction

Activity: Using an iPad investigate content topics in the science and social studies that would invite writing experiences. We will share out.

Lunch

Science	Social Studies
Weathering v. erosion	Often focus summative assessments on essential questions from the model curriculum. Design a writing rubric to evaluate.
Biotic and abiotic factors	Compare and contrast living in different places in the Western Hemisphere
Report on humans' affect on the local environment	Primary v. Secondary sources: create a personal narrative.
Create design and describe your own planet.	Biography or Autobiography/Memoirs
Different seasonal patterns.	Critique of laws/rules
Research cycles and patterns in the solar system	Civic participation
Narrative "What if…" Stories. What if there is no moon?	Arguments for founding the U.S.
Explain the causes of the War of 1812	Convincing family to move to Ohio in the 1790s
	Report/Respond to articles from the Cold War. Would blowing up the moon show that the U.S. was dominant?
	Boston Tea Party
	Rationing Debate

	How did Ohio play a role in the anti-slavery movement?

Tidbits: By high school, 70% of reading should be on non-fiction text, but there are still courses designed around British Literature.

Collaboration between ELA and content area teachers is essential in order to determine who will be assessing writing standards.

Websites:

www.TeachingthatMakesSense.org

-Shows many ideas for writing workshop

-Six Traits of writing information

-Graphic organizers for idea generation: What, why, how chart.

-Choosing topics for research

-Prompted writing

http://www.corestandards.org/ELA-Literacy

-Appendix C is writing exemplars, include teacher annotations.

www.readingandwritingproject.com

-Lucy Calkins website

-Hierarchy of writing examples.

www.parcconline.org

-Draft form of test items

-Test blueprint

Activity: Discuss next steps towards implementations with those from your district.

Next meeting will be focused on Reading. Please bring standards.

Exit Slips completed.

4/5 Mathematics Teacher Leader Meeting

October 30, 2012
8:30 a.m.-3:00 p.m.

Presented by: Christine Sawicki

Norms

- Equity of voice
- Active listening
- Respect for all perspectives
- Manage technology

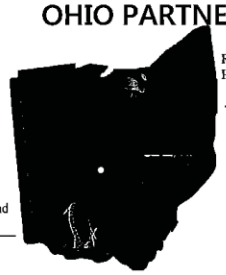
Welcome

- Consensograms
- Introductions
  - Name
  - Grade level you teach
  - District/Building
  - How many years you have taught

Determine Roles

- Note-taker
- Process observer
  - To help groups self monitor
  - The individual should be fully engaged in the conversation and at the same time watch and listen to the group's dynamic
    - Exs- time control, talk time, relevance, ground rules, quality, etc.

OHIO PARTNERS



Rock and Roll Hall of Fame

Indian Mounds

King's Island

Thinkers	Shakers
Likes the big picture including the pros and cons. Can see the possibilities but would rather wait. Let's think about this awhile.	Likes ACTION. Go for it. Give it a try. We'll figure out the details later. A rolling stone gathers no moss!
Feelers	**Doers**
Likes it when everyone is getting along and feeling good. It's important that everyone feels good about the decision.	Likes to have all the details about tasks to be accomplished. Who is doing it? What will happen? When are we starting? Are we ready?

Teacher Leaders will:

- Promote the use of data-based decisions and evidence-based practice.
- Facilitate a collaborative learning culture.
- Participate in developing and supporting a shared vision and clear goals for their schools.
- Promote and model ongoing professional learning and improved practice within a learning community.

- What are the strengths of our style? (4 adjectives)
- What are the limitations of our style? (4 adjectives)
- What style do we find the most difficult to work with and why?
- What do other people need to know about us so that we can work together more effectively?

Implementation

- Teacher leaders will meet with their administration to develop a plan.

Why are you here?

- **Purpose of Teacher Leaders:**
  - To build building-level capacity for supporting the implementation of Ohio's New Learning Standards and the Common Core Standards.

In your groups…

- Discuss the following two bullets and select someone to report out.
  - Tell me something you already know about the CCSS for mathematics.
  - Tell me something you hope to learn more about in terms of the CCSS for mathematics.

Introduction to the Common Core Standards

Mathematical Practices

On the road to 2014-2015

Are we there yet?

Mathematical Practices

- Count off by 8's
- Get into assigned groups
- Everyone will read the introduction and the closing paragraphs.
- As a group, read your assigned practice and complete the worksheet
- Select a reporter
- Share out

Where is everything located?

- Tour of ODE and the documents that are available

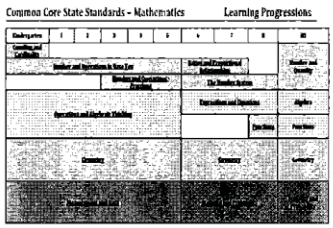
CCSS MATHEMATICAL PRACTICES

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

**These need to be embedded within the content standards.*

CCSS Principles

- Focus
  - Identifies key ideas, understandings and skills for each grade or course
  - Stresses deep learning, which means applying concepts and skills within the same grade or course
- Coherence
  - Articulates a progression of topics across grades and connects to other topics
  - Vertical growth that reflects the nature of the discipline

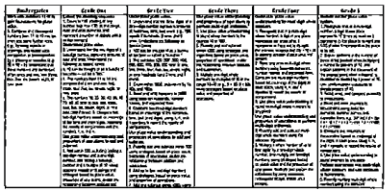


Change of Emphasis K-Grade 5

K-2
- Greater development of how numbers work
- Data analysis is just a tool for working with numbers and shapes

Grades 3-5
- Fractions then decimals
- Multiplication with inverse division
- Operation strategies and relationships developed BEFORE algorithm procedures

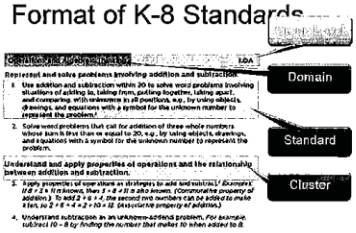
Standards Progression: Number and Operations in Base Ten



Change of Emphasis Grades 6-8

- Beginning of Data Analysis and Probability
- Introduction of Integers, Coordinate Graphing
- Focus on Linear Algebra: numerically, graphically and symbolically
- Completion of Operations with fractions and decimals

Format of K-8 Standards



Critical Areas of Focus

Cross-cutting themes

Mathematics | Grade 2

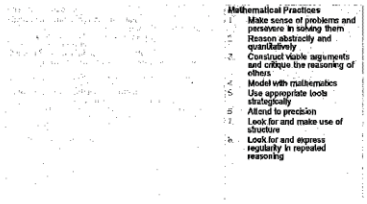
In Grade 2, instructional time should focus on four critical areas: (1) extending understanding of base-ten notation; (2) building fluency with addition and subtraction; (3) using standard units of measure; and (4) describing and analyzing shapes.

(2) Students use their understanding of addition to develop fluency with addition and subtraction within 100. They solve problems within 1000

Critical Areas of Focus Activity

- With a partner...
- Read the 4th or 5th grade level Critical Areas of Focus
  What are the concepts?
  What are the procedures and skills?
  What relationships are students to make?
- Look at the domains, clusters and standards for the same grade(s).
  How do the Critical Areas inform their instruction?
- Report out

Grade Level Overview



Mathematical Practices

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Concepts, Skills and Procedures

Concepts

- Big ideas
- Understandings or meanings
- Strategies
- Relationships

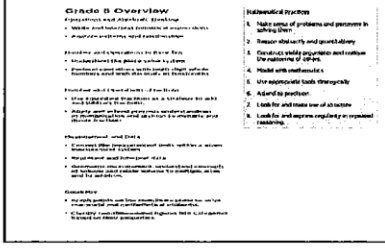
Understanding concepts underlies the development and usage of skills and procedures and leads to connections and transfer.

Skills and Procedures

- Rules
- Routines
- Algorithms

Skills and procedures evolve from the understanding and usage of concepts.

Grade Level Overview



Grade 5 Overview

Mathematical Practices

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

Concepts, Skills and Procedures

Grade 4 Number and Operations in Base Ten

Generalize place value understanding for multi-digit whole numbers.

- Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.*
- Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
- Use place value understanding to round multi-digit whole numbers to any place.

Activity 2:
Task Analysis with CCSSM

- Individually work the Sub problem (Adapted from Mathematics in Context)
- With a partner share your solution then:
  - –Identify the Mathematical Practices
  - –Identify grade level and Critical Area of Focus (use online documents)
  - –Identify the related Clusters and Standards
- Report out

Thank you for your time today!

- Evaluation
- Next Meeting:
  - – November 29, 2012

Wrap up

- Closing Questions
  - – Reflect & Debrief
- Process Observer Report Out

Home Play

- Schedule time to meet with your administrator and complete your implementation sheet for our next meeting.

Youngstown
STATE UNIVERSITY

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Fax 330.941.2705

March 21, 2013

Dr. Karen Larwin, Principal Investigator
Mr. Ronald Iarussi, Co-investigator
Department of Educational Foundations, Research, Technology & Leadership
UNIVERSITY

RE: HSRC Protocol Number: 144-2013
Title: The Effectiveness on Student Achievement of the Teacher Leader Professional Development Model for Common Core Standards Implementation

Dear Dr. Larwin and Mr. Iarussi:

The Institutional Review Board has reviewed the abovementioned protocol and determined that it is exempt from full committee review based on a DHHS Category 5 exemption.

Any changes in your research activity should be promptly reported to the Institutional Review Board and may not be initiated without IRB approval except where necessary to eliminate hazard to human subjects. Any unanticipated problems involving risks to subjects should also be promptly reported to the IRB.

The IRB would like to extend its best wishes to you in the conduct of this study.

Sincerely,

Cathy Bieber Parrott
Chair, YSU Institutional Review Board

CBP:cc

cc: Mr. Joseph Edwards, Interim Chair
Department of Educational Foundations, Research, Technology & Leadership