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Academic Interventions and Academic Achievement
in the Middle School Grades

by

Toby G. Kite

November 2015

A Dissertation submitted to the Education Faculty of Lindenwood University in

partial fulfillment of the requirements for the degree of

Doctor of Education

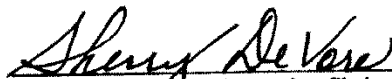
School of Education

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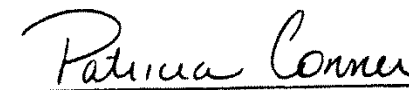
This Dissertation has been approved as partial fulfillment
of the requirements for the degree of
Doctor of Education
Lindenwood University, School of Education


Dr. Sherry DeVore, Dissertation Chair

11-18-2015
Date


Dr. Doug Hayter, Committee Member

11/18/15
Date


Dr. Patricia Conner, Committee Member

11-18-2015
Date

Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work at Lindenwood University and that I have not submitted it for any other college or university course or degree.

Full Legal Name: Toby G. Kite

Signature: Toby Kite Date: 11/18/15

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Abstract

After the passing of the Individuals with Disabilities Act of 2004, many schools began to use a Response to Intervention (RtI) model instead of the discrepancy model when identifying students with specific learning disabilities (National Center on Response to Intervention, 2011). When elementary schools adopted the RtI model, it was shown to be successful with any students who need academic interventions (National Center on Response to Intervention, 2011). The success at the elementary level has led to middle schools adopting the model with varying success (National Center on Response to Intervention, 2011). In this study, middle schools that have developed an academic RtI program through the Professional Learning Community (PLC) process were compared to non-PLC middle schools that may not provide a systemic process of academic interventions to determine if PLC schools produce higher academic achievement. Academic achievement was determined by students' Missouri Assessment Program (MAP) index scores in communication arts for seventh and eighth graders. As a result of the application of a *t*-test, there was not a significant difference between the scores of PLC schools and the scores of non-PLC schools. Building principals of the middle schools in the PLC group were surveyed to identify the characteristics of the RtI model that were in place. The survey results of the six top-performing PLC schools were analyzed and compared to the entire PLC group to determine what characteristics lead to improved academic achievement. The components of RtI present in the top-performing schools included interventions that were implemented for at least three years, interventions provided a minimum of three days per week, and a maximum of 70 minutes of intervention per week.

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Chapter One: Introduction

Public education in the United States has always had a significant impact on society and the development of upcoming generations. Due to this impact on the development of children, public education has been held more accountable in the past 20 years (Burt et al., 2014). With the emphasis on accountability, higher expectations are being placed on school districts across the country (Missouri Department of Elementary and Secondary Education [MODESE], 2012a). Along with this, public schools also face the challenge of students having more and more expectations placed on them due to responsibilities away from school (Barton & Stepanek, 2009). This dynamic is making it increasingly difficult for schools to meet the needs of a diverse student population (Harlacher & Siler, 2011).

Many schools are looking at different approaches to provide support to students to ensure educational growth (Harlacher & Siler, 2011). Schools are implementing intervention programs into the school setting to allow teachers time to meet with students who need additional support during the school day (Harlacher & Siler, 2011). The concept of interventions for students during the school day was the motivation for this research.

The background of the study, conceptual framework, problem statement, purpose of the study, research questions, and significance of the study are provided in Chapter One. This chapter also includes an overview of the limitations to the study and the definitions of terms. A summary is presented at the end of this chapter.

Background of the Study

As the accountability requirements for schools continue to increase under the No Child Left Behind Act (NCLB), schools are forced to look for different ways to improve student achievement scores (No Child Left Behind Act [NCLB], 2002). With this increased accountability, there has been a push in public education to incorporate Response to Intervention (RtI) programs into school settings (Brown-Chisdey & Steege, 2011). Response to intervention programs integrate assessments and intervention within a multi-level prevention system to maximize student achievement and reduce behavior problems (National Center on Response to Intervention, 2011). With the reauthorization of the Individuals with Disabilities Act in 2004, RtI has become more commonly implemented in special education (Barton & Stepanek, 2009).

In order to narrow the growing gap in accountability scores among students, educators believe the tiered approach to intervention, which is laid out in the RtI model, will help to improve overall scores in the general education population (Center on Response to Intervention, 2010). This philosophy has gained momentum as Professional Learning Communities (PLCs) continue to grow across the nation as well (DuFour & Fullan, 2013). The PLC model focuses on four key corollary questions:

1. What do we want each student to learn?
2. How will we know when each student has learned it?
3. How will we respond when a student experiences difficulty in learning?
4. How will we respond when a student does learn the material? (DuFour & Fullan, 2013, pp. 183-184)

When these questions are asked, student needs are most likely identified and addressed (DuFour & Fullan, 2013).

Momentum has developed due to the third corollary question of PLCs to incorporate RtI into general education (DuFour & Fullan, 2013). Studies have indicated early interventions with students will help get students back on target (DuFour, DuFour, Eaker, & Karhanek, 2009). As more school districts across the country implement an RtI approach to help unsuccessful students, the question begins to surface as to what characteristics of an RtI program have the biggest impact on improving student achievement (Buffum, Mattos, & Weber, 2009). With the growing pressure on schools to meet accountability expectations set forth by NCLB, it is increasingly important for educators to identify the interventions that have the biggest impact on student achievement and yield the best results (Buffum et al., 2009).

More data need to be analyzed to determine the relationship between RtI programs and student achievement in secondary-level schools (Levin, Belfield, Muenning, & Rouse, 2007). The intention of this study was to identify the significant difference, if any, that exists between student achievement of middle school students who attend PLC schools that have implemented response to intervention and students who attend non-PLC middle schools that may not have implemented a systemic process of academic interventions. The researcher also sought to identify characteristics of RtI programs that increase growth in student achievement.

Conceptual Framework

The research in this study was based on several conceptual models, the first being RtI. There are four essential components to RtI:

1. It is a school-wide, multi-level instructional and behavioral system for preventing school failure
2. Screening of students
3. Progress monitoring of students
4. Data-based decision making for instruction, movement within the multi-level system, and disability identification (Center on Response to Intervention, 2010, p. 1)

Educators proctor a series of benchmark tests to identify students performing below the expected learning outcome for a given objective (Buffum et al., 2009). Using the results from the benchmark tests, students are placed in one of three intervention tiers to receive additional instruction (Buffum et al., 2009).

The first level of intervention begins with evidence-based instruction, progress monitoring, and support provided to all students (Duffy & Scala, 2012). Students who have not had success in the first tier of RtI receive specific, targeted interventions in tier two (Duffy & Scala, 2012). Progress is monitored frequently in tier two, and if one intervention is not successful, another more intense intervention is implemented (Duffy & Scala, 2012). In the third tier, with parental consent, a comprehensive evaluation may be conducted by a team to determine eligibility for special education (Duffy & Scala, 2012). By following the RtI approach, general education teachers focus on the instructional

support provided to all students rather than identifying learning deficits in students who are not achieving at the level expected (Burns & Gibbons, 2013).

Another model central to this study is the work of DuFour and the development of PLCs. Through regular collaboration, teachers work together to identify the answers to the four corollary questions that are identified in a PLC (DuFour & Fullan, 2013). The third question of the PLC process specifically focuses on what steps will take place to intervene with students who experience difficulties learning (DuFour & Fullan, 2013). Professional Learning Communities are gaining momentum throughout the nation as research begins to shed light on the effectiveness of a PLC in meeting the academic needs of students (DuFour & Fullan, 2013).

Problem Statement

It is important to continue to research what impact RtI programs have on student achievement as these programs become more common within PLC schools. Specifically, more research needs to be conducted to show what effects interventions have on students at the secondary level (Allington, 2011). To this point, research compiled on RtI has been focused on students in the elementary grades.

It is also important to identify which parts of an academic intervention program have a positive effect on communication arts assessment results. With the departmentalization of core subject areas and the movement of students from classroom to classroom within a middle school setting, it is important to identify what pieces of an intervention program increase achievement of middle school students. As more schools begin to implement similar programs within districts, it is important to know what will make the programs successful at the middle school level.

After identifying the parts of an intervention program that enhance student achievement, school districts will be able to have more success in developing interventions that will impact the students within their schools. Identification of these elements will also improve a teacher's ability to help the students meet the given objectives of a course. Considering a middle school takes on a noticeably different learning environment compared to an elementary school, it is important to identify what works best at the middle school level.

Purpose of the Study

The purpose of this study was to examine the Missouri Assessment Program (MAP) communication arts index scores for years 2012, 2013, and 2014 of PLC middle schools that have implemented an RtI model and non-PLC middle schools that may not have implemented a systemic process of academic interventions. Also, a three-year review of the academic intervention components implemented through the PLC process in middle schools achieving above the Missouri average in the area of communication arts was conducted. This process allowed for identification of the difference, if any, in the effectiveness of interventions when developed collaboratively through the PLC process.

Summative assessment results from the participating schools were collected to determine which interventions have the greatest correlation to student achievement. The MAP index scores were used to analyze growth in student achievement. Identification of successful components will improve a teacher's ability to help students meet the given objectives of a course. A learning environment is not the same in a middle school when

compared to an elementary school, which is why it is necessary to determine what teaching strategies are more effective in the middle school (Brozo, 2009).

Research questions and hypothesis. The following research questions and hypothesis guided this study:

1. What is the statistical difference between the Missouri Assessment Program (MAP) communication arts index scores of middle schools that have adopted the Professional Learning Community (PLC) model and have implemented Response to Intervention (RtI) and non-PLC schools that may not have implemented a systemic process of academic interventions, over a three-year period?

H1₀: There is no statistical difference between the Missouri Assessment Program (MAP) communication arts index scores of middle schools that have adopted the Professional Learning Community (PLC) model and have implemented Response to Intervention (RtI) and non-PLC schools that may not have implemented a systemic process of academic interventions, over a three-year period.

2. What components of academic interventions are implemented in middle schools that have adopted the PLC model and have achieved above the Missouri average on the MAP communication arts index scores over a three-year period?

Significance of the Study

This study adds to the collection of data that support, or contradict, the claim academic intervention programs improve achievement of middle school students. This study also adds to the current body of knowledge by identifying what characteristics of RtI, if any, are linked to improved student achievement. This information is important as more school districts continue the trend of adding RtI at their middle schools. By

identifying the parts of an intervention program that increase student achievement, school districts will have more success in developing interventions that impact the students within their schools.

Limitations and Assumption of the Study

The limitations of this study were as follows:

Sample size. The sample size of this study was limited to all participating Missouri school districts that are currently a PLC and have received PLC training through a Regional Professional Development Center (RPDC). The sample size of the study was primarily focused on rural and suburban school districts located in the midwest portion of the United States. The study did not take into consideration the impact RTI programs have in urban districts. The results of the study may not distinguish the characteristics that work best for grades seven and eight.

Survey instrument. Additionally, the survey instrument was created by the researcher; thus, reliability and validity of the instrument are a limitation. The questions were designed to determine the characteristics of interventions being implemented in the participating schools. Thus the study is limited by the levels of fidelity of the intervention programs which are implemented.

Teacher effectiveness. Another limit to the study is the variation in effectiveness of teachers implementing the intervention programs or the curriculum being utilized in the programs. The study was also limited to schools containing seventh- and eighth-grade students. Interventions introduced prior to middle school were not taken into consideration as part of the study.

Student demographics. Student demographics were another limitation. The researcher assessed how academic intervention affects student performance; however, student ethnicity, socio-economic status, and parenting status of students receiving the academic interventions were not considered. The population and size of each district also limited the study.

The following assumption was supported in this study:

1. Due to the number of possible types of academic interventions in non-PLC middle schools, it was assumed this group did not implement a systemic process of academic interventions.

Definition of Terms

For the purposes of this study, the following terms were defined:

End-of-course exams (EOC). The MODESE (2013) created the end-of-course (EOC) exams in an effort to adapt testing to the needs of Missouri districts, schools, teachers, and students, while meeting state and federal requirements. The following purposes were identified for the EOC assessments:

- Measuring and reflecting student mastery toward post-secondary readiness.
- Identifying students' strengths and weakness.
- Communicating expectations for all students.
- Serving as the basis for state and national accountability plans. (MODESE, 2013, p. 2)

The EOC Assessments are designed to meet these expectations.

Professional learning community (PLC). For the purpose of this study, a PLC was defined as a school in which the professionals (administrators and teachers)

continuously seek and share learning to increase effectiveness for students and to act on what is learned (Pruitt & Roberts, 2009).

Response to intervention (RtI). The RtI model “integrates assessment and intervention within a multi-level prevention system to maximize student achievement and to reduce behavior problems” (National Center on Response to Intervention, 2011, p. 2). When using an RtI model, a student’s progress is constantly monitored, and instruction is adjusted to the needs of the individual student (National Center on Response to Intervention, 2011). The model is also used to “identify students with learning disabilities or other disabilities” (National Center On Response To Intervention, 2011, p. 1).

Summary

The intention of this study was to identify the characteristics of an intervention program that will give middle school students the greatest opportunity to increase achievement in communication arts. As more pressure is placed on school districts to meet accountability requirements set in place by NCLB (MODESE, 2012a), educators across the country are looking for more innovative ways to meet the needs of students (DuFour & Fullan, 2013). This has led to an increase in the use of RtI models not only in special education, but in the general education setting as well (Buffum, Mattos, & Weber, 2010).

Some school districts have observed significant gains in student achievement due specifically to the intervention programs that have been implemented within the districts (Dobbins, Kurtts, & Rush, 2010). Other schools that have implemented intervention programs are only seeing modest, if any, improvement in student achievement (Dobbins

et al., 2010). By identifying the characteristics that make interventions successful, educators can fine tune the process of developing intervention programs that work. By doing so, students will have more success within the classrooms.

Chapter Two consists of the review of the literature related to the study and includes an overview of the increased emphasis placed on student achievement due to the passing of NCLB. The literature review also includes an examination of the development of PLCs due to the passing of NCLB and how PLC schools have demonstrated improved student achievement. The literature review also shows how PLC schools have developed pyramids of interventions to help improve student achievement.

Chapter Two: Review of Literature

Academic interventions are becoming more common in school districts across the nation (Burns & Gibbons, 2013). This increased trend in academic interventions is partially due to the increase in accountability imposed since the passing of NCLB (NCLB, 2002). Chapter Two is a literature review of the development and progression of academic intervention programs in public education.

The first section of the literature review focuses on the historical background of academic interventions and what changes took place to cause the implementation of interventions. The next section of the chapter includes an overview of the historical background and underpinnings behind the RtI approach to academic interventions and the impact RtI has had at the elementary level. This is followed by a section about the growth of the Professional Learning Community (PLC) model in public schools and how the PLC process has impacted the increase of academic interventions, similar to the RtI model. The final two sections of the literature review focus on the impact of Common Core standards on academic interventions, as well as the impact MSIP 5 will have on academic interventions.

Interventions Before RtI

Traditionally, teaching consists of instruction given to the entire group where the instruction focuses on a single topic (Galton, Hargreaves, & Pell, 2009), and regardless of each student's ability level, the instruction does not change. Teaching in this style greatly limits students from actively participating in the lesson and instead promotes whole-group instruction which is primarily led by the instructor (Galton et al., 2009). Also according to Galton et al. (2009), this whole-group instruction design allows students to

become passive learners and instead of actively seeking out the information on their own, students want the teacher to provide the information. Although the students have different learning abilities, they are provided with one method of teaching and either understand the material or fall behind their peers.

Students who are not able to maintain the pace of the classroom are usually referred to the special education department for testing (Duffy & Scala, 2012). Within this design a student must first fail and be labeled with a disability before he or she can access the help needed (Aron & Loprest, 2012). Using this design, students would typically not be identified with a learning disability until the end of second grade or the beginning of third grade (Dimino & Gersten, 2006).

Dimino and Gersten (2006) went on to state that once students have qualified for special education, they would be one to two years behind the other students in their class. After qualifying for special education, an individual education plan would be developed to help the student meet his or her educational needs (Aron & Loprest, 2012). This method of qualifying for special education prevents many students from receiving the necessary help they need to succeed in the classroom (Aron & Loprest, 2012).

Qualifying for special education often means the student will be sent to an outside classroom for special education instruction and will miss instructional time in the regular classroom (Dimino & Gersten, 2006). Since students who have learning disabilities also tend to show antisocial or problematic behaviors, teachers are quick to have these students removed from the classroom (Ingalls, Hammond, & Trussel, 2011). Ingalls et al. (2011) discovered interventions used in the resource room primarily focus on academic skills and do not address the behavioral needs of the students.

Special education classrooms focus instruction on specific skills which address a student's deficits in content (Dimino & Gersten, 2006). Dimino and Gersten (2006) stated in this type of setting students struggle to keep up with their peers who spend the entire day in the general education classroom. This tends to lead to fewer special education students receiving a high school diploma when compared to students who are in the general education setting (Aron & Loprest, 2012). Special education students face specific challenges in regard to achievement, high school graduation, and post-secondary education (Hernandez-Finch, 2012).

Historical Background of Academic Intervention

The concept of academic interventions has gained momentum in education over the past 10 years since the signing of the NCLB Act. The NCLB Act was originally passed by Congress in 2001 with the intent of placing more accountability on public education across the nation (NCLB, 2002). One of the primary components of the legislation was that 100% of all students receiving a public education would meet proficiency requirements in mathematics and communication arts by the year 2014 (NCLB, 2002). This accountability standard forced public school districts to reassess students' summative assessments and to make decisions concerning students who were not achieving at expected levels (Allington, 2011).

Effective in the 2012-2013 school year, the U.S. Department of Education approved Missouri's Elementary and Secondary Education Act (ESEA) waiver giving the

state flexibility from NCLB (MODESE, 2012b). To receive the waiver, the MODESE must accomplish the following:

- Implement higher academic standards
- Create one state system of accountability
- Allow more flexible Title I spending for schools
- Focus on school improvement
- Improve the teacher evaluation system. (MODESE, 2012b, para. 2)

The waiver allows Missouri to use its own accountability system to more effectively identify struggling schools, to efficiently direct resources to struggling schools, and to recognize schools achieving exemplary results (MODESE, 2012b).

Discrepancy model. Prior to RtI, students were basically provided two types of instruction. Students achieving at grade level were instructed in the regular classroom; if they were not on grade level, students were referred to special education (Aron & Loprest, 2012). If students qualified for special education, they were pulled out of the general classroom and placed in the special education classroom for children with disabilities (Nunn & Jantz, 2009).

This process provided no examination of interrelationships between regular and special education classrooms, nor did it incorporate any contemporary innovation in the school setting (Nunn & Jantz, 2009). This process cost up to three times more to educate a child with special needs compared to a student in the general education setting (Fitch, 2013). These concerns, along with other concerns, led those in education to search for a program that provided intervention sooner and minimized the costs.

For several years, a discrepancy model has been used to determine if a student is learning disabled (Buffum et al., 2010). Practitioners use a discrepancy model to determine if:

- A discrepancy exists between intellectual and cognitive ability.
- A deficit exists regarding cognitive processing.
- Educational needs cannot be met without special education. (Buffum et al., 2010, p. 10)

Under this model, often early elementary-aged students will be in the general education classroom for two or three years before they qualify for special education services (Restori, Katz, & Lee, 2009).

The discrepancy model does not account for students who do not qualify as learning disabled but still need instructional modifications within the classroom (Barnes & Harlacher, 2008). According to Barnes and Harlacher (2008), when utilizing a discrepancy model, it is not until third or fourth grade when a large enough discrepancy exists to qualify a student for special education. This process requires an extensive time lapse and waiting for a child to fail before services can be provided (Barnes & Harlacher, 2008).

IDEA 2004 and RtI. According to Brozo (2009), there is no way to determine if a child has a learning disability by using an achievement discrepancy model or by using a non-RtI model. This idea began a discussion about the ability to accurately identify students with learning disabilities. After years of using the “wait to fail” approach to identify students with learning disabilities, the United States Department of Education (2007) issued the following guidelines:

The provisions related to child find in section 612(1)(3) of the Individuals with Disabilities Act, require that a State have in effect policies and procedures to ensure that the State identifies, locates and evaluates all children with disabilities residing in the State, including children with disabilities who are homeless or are wards of the State, and children with disabilities attending private schools, regardless of the severity of their disability, and who are in need of special education and related services. (p. 1)

In order to meet these guidelines and mandates, the Department of Education began the process for districts to implement RtI (Burns & Gibbons, 2013). Once RtI was implemented in schools, educators discovered traditional special education categories to be less important (Burns & Gibbons, 2013).

In 2004 with the reauthorization of the IDEA, RtI became an important process for students who may be identified as having a learning disability. Prior to IDEA, Intelligence Quotient (IQ)-achievement discrepancy was primarily used to identify students with a learning disability in order to receive special services (Gersten et al., 2009). This revision in the law allowed educators to use RtI to qualify students for special education (Fuchs, Fuchs, & Compton, 2010). Countless secondary schools [middle schools] across the United States that had no structured literacy program, prior to the reauthorization of IDEA, began adopting the RtI model almost overnight (Brozo, 2009).

Advent of Response to Intervention in Schools

One of the models that has gained momentum is RtI, which was originally developed to improve the achievement level of students with special needs (Buffum et

al., 2010). Due to success with special need students, educators started utilizing RtI approaches with general education students as well, in an attempt to improve student achievement (Buffum et al., 2010). According to Barton and Stepanek (2009), schools must stop looking for answers to academic and behavioral problems by identifying a deficiency within the student (Barton & Stepanek, 2009). Struggling students are not identified as having specific learning disabilities until all other explanations have been ruled out and until the impact of instructional adaptations has been explored (Barton & Stepanek, 2009).

Approximately two-thirds of students in eighth grade read at a lower grade-level equivalency than what the National Assessment of Education Progress test, commonly known as NAEP, deems a proficient level (Rampey, Dion, & Donahue, 2013). A reason so many eighth graders read below grade level is because the discrepancy formula has been used in elementary schools for so long to identify students for special education (Ehren, 2012). According to Ehren (2012), due to this lack of assistance for elementary-aged students, middle school educators are likely to encounter students who have fallen through the cracks and are now having serious learning struggles.

Burns and Gibbons (2013) described RtI as a school-wide initiative that aligns itself with both school reform and school improvement efforts with the main objective being to help all students achieve proficiency. This shift in design moves away from the wait-to-fail method to one that intervenes immediately to prevent delays and challenges that may lead to the diagnosis of a learning disability (Greenwood et al., 2011). When RtI is implemented successfully, it can assist buildings in meeting their state

requirements by providing the greatest level of instruction to each student (Ysseldyke, Burns, Scholin, & Parker, 2010).

As RtI implementation becomes more widespread, evidence is accumulating about the framework's impact on school and student-level outcomes (Barton & Stepanek, 2009). Research and evaluation studies have linked RtI to the following results:

1. Improvements in student academic performance—including greater numbers of students who demonstrate proficiency on state tests, decreased rates of grade retentions, and more students who are served by school-based teams—without increasing special education referral rates.
2. Students who have been identified as unresponsive go on to experience positive outcomes for English language learners in gaining academic skills and closing performance gaps.
3. Improved reading performance for native English speakers and positive outcomes for English language learners in gaining academic skills and closing performance gaps.
4. A reduction in problem behaviors school wide and less disruptive behavior in the classroom. (Barton & Stepanek, 2009, p. 18)

Although RtI is most commonly used with general education students at the elementary level, there are more secondary schools beginning to implement RtI programs (Burns & Gibbons, 2013).

Whether incorporating RtI at the elementary or secondary level, teachers must engage in specific actions:

1. Correctly identify students who need intervention.

2. Deliver intervention that effectively resolves the learning problem for the majority of students exposed to the intervention.
3. Monitor the effects of the intervention and troubleshoot to ensure intervention integrity and positive effects on learning.
4. Make decisions about the need for more intensive or less intensive intervention.
5. Link resulting RtI data to referral and eligibility decisions in special education.
6. Link resulting RtI data to system programming changes. (VanDerHeyden, n.d., p. 1)

Data indicate RtI models that follow the above implementation components have successfully narrowed the student achievement gap of students with an individual education plan (VanDerHeyden, n.d.).

Response to intervention model. When a student lacks the capability to complete an academic task because of limited or missing basic skills, cognitive strategies, or academic-enabling skills, that student is still in the acquisition stage of learning (Gersten et al., 2009). The student cannot be expected to be motivated or successful as a learner unless he or she is first explicitly taught these weak or absent essential skills (Wright, 2012). Wright (2012) also stated to verify the presence of this motivation problem, the teacher collects information through observations of the student engaging in academic tasks; interviews the student; and examines work products, quizzes, or tests; all of which demonstrate the student lacks basic skills, cognitive strategies, or academic-

enabling skills essential to the academic task. Students who are not motivated because they lack essential skills need to be taught those skills (Wright, 2012).

According to Wright (2012), when teaching these skills, students benefit from a teacher following a direct instruction format which includes the following:

- Ensures that the lesson content is appropriately matched to students' abilities.
- Opens the lesson with a brief review of concepts or material that were previously presented.
- States the goals of the current day's lesson.
- Breaks new material into small, manageable increments, or steps.
- Throughout the lesson, provides adequate explanations and detailed instructions for all concepts and materials being taught.
- Regularly checks for student understanding by posing frequent and eliciting group responses.
- Verifies that students are experiencing sufficient success in the lesson content to shape their learning in the desired direction and to maintain student motivation and engagement.
- Provides timely and regular performance feedback and corrections throughout the lesson as needed to guide student learning.
- Allows students the chance to engage in practice activities distributed throughout the lesson.
- Ensures that students have adequate support to be successful during independent seatwork practice activities. (Ingalls et al., 2011, pp. 25-32)

Wright (2012) claimed students would benefit from teachers implementing direct instruction when introducing these skills.

Academic interventions under RtI are incomplete without data collected to document whether those interventions are actually benefitting students (Buffum et al., 2009). An RtI intervention can be viewed as fatally flawed if it lacks any one of these data elements:

1. Clear definition of the presenting student problems.
2. Calculation of the student's starting point, or baseline performance, in the identified area of concern.
3. Setting of a specific goal for student improvement.
4. Selection of a method to monitor the student's progress formatively during the intervention to judge whether the intervention is successful in helping the student attain the goal. (Wright, 2012, p. 4)

Clearly defining the student problem and collecting data are essential to implementing any school-based intervention.

Data collection. Since general education teachers are often the first responders who provide classroom interventions under RtI, they need to know how to set up a data collection plan that includes baseline, goal, and progress-monitoring (Ysseldyke et al., 2010). As teachers adopt the role of RtI classroom interventionist, they are likely to need assistance with the multi-step process of designing and implementing data collection, as well as interpreting the resulting data (Burns & Gibbons, 2013). Below are the essential steps teachers should follow to ensure data collection is adequate to the task of measuring the impact of classroom interventions:

- The teacher defines the student problem in clear, specific terms that allow the instructor to select an appropriate source of classroom assessment to measure and monitor the problem.
- The teacher chooses a method for collecting data that can be managed in the classroom setting and that will provide useful information about the student problem. When selecting a data collection method, the teacher also decides how frequently that data will be collected during intervention progress-monitoring.
- The teacher should collect 3-5 data-points prior to starting the intervention to calculate the student's baseline, or starting point, in the skill or behavior that is being targeted for intervention. The student's baseline performance serves as an initial marker against which to compare his or her outcome performance at the end of the intervention.
- The length of time reserved for the intervention should be sufficient to allow enough data to be collected to clearly demonstrate whether that intervention was successful.
- The teacher calculates a goal for the student that, if attained by the end of the intervention period, will indicate that the intervention was successful.
- Prior to the end of the intervention period, the teacher must decide how he or she will summarize the actual progress-monitoring data. (Burns & Gibbons, 2013, p. 14)

At the conclusion of the intervention, the teacher directly compares the actual student progress with the goal originally set, and if actual student progress meets or exceeds the goal, the intervention is judged to be successful (Burns & Gibbons, 2013).

Implementing Response to Intervention at Various Grade Levels

According to Ehren (2012), successful implementation of an RtI program can translate into fewer individualized education plans, reduced rates of student disengagement, and increased numbers of students achieving grade-level standards in general education. However, Sansosti, Noltemeyer, and Goss (2010) argued while the elementary level is modifying classroom practices in general and special education settings to support RtI, research authenticating the application of RtI within secondary settings is limited. Allington (2011) reiterated this claim saying there is essentially no research on RtI implementation at the middle school level.

The empirical foundations of RtI have been developed within the research of early literacy, specifically in the elementary school context (Fagella-Luby & Wardell, 2011). Fagella-Luby and Wardell (2011) reported the use of early literacy research causes many problems when the model is directly applied to the middle school setting. However, Ehren (2012) noted elementary school-level instruction that has been validated is also effective at the middle school level. The middle school setting increases the challenge of implementation due in part to the complexity of the organization compared to the elementary school and the immense challenge of scheduling (Ehren, 2012).

Although research is readily available for elementary implementation of RtI, the difference in middle school design reflects multiple alterations in implementation (Evelyns & Lori, 2011). Therefore, RtI in the middle school must have a different format

and design than at the elementary level (Vaughn & Fletcher, 2010). Pyle and Vaughn (2012) supported the idea for a middle school RtI model, teachers must have the skills needed to address a varied level of learners, primarily those struggling in literacy. Instruction, as well as intervention, at the middle school level is conceptually different than what is found at the elementary level (Pyle & Vaughn, 2012).

Leaders responsible for implementing RtI at the middle or high school level are hesitant to replicate the elementary design due to its foundational basis on early literacy (King, Lemons, & Hill, 2012). Due to this, secondary administrators are cautioned to avoid the same approach taken by early education specialists regarding tiered interventions (King et al., 2012). As opposed to a pull-out system found in the elementary setting, Burns and Gibbons (2013) found interventions within the middle school level are typically implemented in specially designed courses.

Allington (2011) argued before beginning implementation, educators must first realize there is limited research to draw upon that shows the effectiveness of RtI at the middle school level. Regardless of the design or method of implementation, RtI may relieve the issues related to the ability-achievement discrepancy model, but secondary schools have shown little success from applying the intervention approach (Edmonds et al., 2009). Edmonds et al. (2009) also claimed gains similar to the elementary design have not been observed for students at the secondary level.

At the middle school level, RtI has the potential to build capacity for meeting the needs of all students (Evelyns & Lori, 2011), but without adequate implementation of the key elements, success is unlikely. Ehren (2012) pointed out by the time some students reach middle school, their experience with academic failure is so complex interventions

are often ineffective, even through high school. Ehren (2012) also wrote the complexity of the organization, in addition to the complexity of student scheduling, creates an increased challenge over the elementary setting. Because the schedules are more flexible, elementary schools are more successful in modifying and implementing interventions throughout the school day (Burns & Gibbons, 2013).

Because of the difficulty in modifying schedules in middle schools, tier one intervention is most utilized to meet the needs of the students (Dorn & Schubert, 2008). These tier one interventions include quality core curriculum and interventions provided to students while supporting the teachers with professional development (Dorn & Schubert, 2008). Along with the challenges of modifying schedules, staff responsibilities, course requirements, and school culture also make it challenging to integrate RtI into the middle school setting (Pyle & Vaughn, 2012).

Because of these challenges, alterations to RtI programs need to be considered at the middle school level. There is a need for studies which focus on intervention for students at any grade level who are identified as inadequate responders (Vaughn & Fletcher, 2010). Across the country, school districts are continuing to implement RtI programs at the middle school level (Allington, 2011). These middle schools need additional research that supports the RtI system is successful at this level. Due to the struggle with meeting tier two and tier three needs, RtI may not be an adequate route for students who show chronic problems in the middle school (King et al., 2012).

Challenges to Implementing RtI

While RtI has many anticipated benefits in the school setting, there are limitations to the design (Keller-Margulis, 2012). Barnes and Harlacher (2008) were concerned that as RtI has progressed from research to practice, a constricted model is being presented to educators as opposed to the flexible model that was originally designed. Response to intervention should not only rely on evidence-based instruction, but must also include a method that provides a high level of support for students (Beecher, 2011).

According to Beecher (2011), the success of students relies heavily on a positive relationship between school and home. It is crucial to keep parents informed so they understand the RtI process and how it benefits their children (Friedman, 2010).

According to Kashima, Schleich, and Spradlin (2009), students demonstrate positive attitudes in regard to learning and school, higher achievement scores, improved behavior, increased homework completion and attendance, more participation in academic activities, and fewer mislabels of special education when families are more involved in their students' education. If parents do not understand and support RtI, the system may not be able effectively implemented in the school.

The communication process between the special education teacher, who designs the intervention, and the general education teacher can also impede the implementation of RtI (Sanger, 2012). According to Sanger (2012), it is very important to avoid power struggles between the classroom teacher and those trained to provide specialized services, such as the special education teacher or the speech-language pathologist. Teachers are encouraged to examine their current strategies and ensure the focus is on scientifically based instruction to include differentiated instruction (Ehren, 2012).

Tier one of RtI is the most debated level in literature due to the difference between the classroom teachers' views and those of the intervention team (Hernandez-Finch, 2012). Additional research is needed to design an outcome that can be agreed upon to measure tier one success (Hernandez-Finch, 2012). This idea was supported by Dimino and Gersten (2006), who stated the teacher's lack of effective training was the cause of the child not to respond in tier one. Dimino and Gersten (2006) went on to state teachers argue benchmarks of success indicate nothing more than guidelines for where a student should be academically at a certain point throughout the year.

Differentiated Instruction

Students of today come from a wide range of diversity: culturally, linguistically, cognitively, and among learning styles (Huebner, 2010). It is natural to use differentiated instruction to meet the needs of students who are all at different learning levels. The main goal of differentiated instruction is to minimize the number of diverse students who receive special education services (Walker-Dalhouse et al., 2009).

The long-term goal of differentiated instruction is for teachers to avoid following skilled sequence mastery that does not match students' ability levels and instead to adjust instruction based on students' individualized needs (Fox & Hoffman, 2011). Another goal of differentiated instruction is to decrease the number of students struggling in the classroom as a result of inadequate instruction (Walker-Dalhouse et al., 2009). Data-driven differentiated instruction can mediate reading problems when implemented appropriately (Fox & Hoffman, 2011).

There are many reasons to avoid a classroom that does not implement differentiated instruction. According to Tomlinson (2005), a uniform classroom exists

because teachers lack high-quality professional development relating to differentiated instruction. A review was provided by Rock, Gregg, Ellis, and Gable (2008) about the vast amount of research proving positive student growth outcomes relate to the complete implementation of differentiated instruction within a mixed-ability classroom. Students who are instructed through differentiation and the utilization of same-level groups demonstrate significantly higher achievement over students whose teachers utilize whole-class instruction (Fox & Hoffman, 2011).

Instructors must be well-trained in differentiated instruction in order to adequately implement tiered intervention in the general classroom (Jones, Yessel, & Grant, 2012). According to Fuchs and Deshler (2007), scientifically validated instruction focuses on a process in which tested instructional procedures are implemented to accomplish student achievement. Differentiation must be included in the classroom instruction to meet the many different learning styles of students (Northey, 2013). This is why differentiated instruction is necessary to meet the requirements of tier one RtI.

Teachers must receive productive professional development if they are to successfully incorporate differentiated instruction in the classroom (Jones et al., 2012). In order to develop the skills they need to implement differentiated instruction, teachers must be provided needed professional development (Fuchs & Deshler, 2007). The training teachers receive must help them become cognizant of the correlation between student assessment and instruction (Demos & Foshay, 2009). When teachers have received the proper training, they will be able to better identify each student's unique learning style as well as learning preferences (Demos & Foshay, 2009).

Interventions in a Professional Learning Community

Many secondary schools are beginning to integrate intervention programs due to the growth of the PLC model (Buffum et al., 2009). The purpose of a PLC is to create a school environment that focuses on data-driven analysis and emphasizes a results-oriented approach to education (DuFour & Fullan, 2013). To successfully accomplish this, the school must function as a collaborative community where communication among staff becomes the normal routine of building functions (DuFour & Fullan, 2013). As opposed to decisions made by administration and implemented by teachers, decisions are made by the whole group through the collaborative process (DuFour & Fullan, 2013).

For this shift to occur, the building of educators must share a mission and vision and have common values and goals (DuFour & Fullan, 2013). This is the foundation that allows a PLC to grow. As a collaborative culture begins to take hold within the school, educators begin to examine challenges from a different perspective (DuFour et al., 2009). There are four corollary questions of a PLC that guide the decision-making process:

1. What do we want students to learn?
2. How will we know if the students learned the material?
3. What will we do if students do not learn?
4. How we will celebrate when students learn the material?

(DuFour & Fullan, 2013, pp. 183-184)

By analyzing the third corollary question, educators actively assess what accommodations need to be made to assist students who are not learning the material (DuFour et al., 2009).

The pyramid of intervention is based on the premise some students need more time and support to ensure their learning (Buffum et al., 2009). It encourages educators not to wait until students possess the correct label to provide support, because the students could fall so far behind they can never catch up with grade-level expectations (Buffum et al., 2009). The pyramid provides a systemic process of intervention that is implemented school-wide, rather than varying from teacher to teacher (Buffum et al., 2009). The pyramid also provides academic and behavioral interventions; the academic interventions are for those who cannot learn and the behavioral interventions for those who refuse to learn (Buffum et al., 2009). The pyramid of interventions utilizes a system of interventions that are increasingly more intensive and directive and are commonly represented visually by pyramids with three tiers (Center on Response to Intervention, 2010).

The base level of the pyramid of intervention includes the “initial interventions” that are implemented when some students do not learn essential skills (Buffum et al., 2009, p. 6). Students are then screened to identify who may need additional time and support (Buffum et al., 2009). According to Buffum et al. (2009), schools use a variety of different screening processes; many schools use benchmark assessments that are already built into their assessment program to screen students. Once students have been identified to receive tier two interventions, educators must then frequently monitor progress of the students in order to determine if the interventions are improving achievement (Buffum et al., 2009).

In a pyramid of intervention, it is important for this progress monitoring to be timely and data-driven (Burns & Gibbons, 2013). It is not uncommon for PLC schools to

modify the master schedule in order to provide time for interventions to take place during the school day (Buffum et al., 2009). This modification in the schedule allows students to receive interventions without missing regular classroom instruction.

It is also important for students to receive timely interventions that begin as soon as need for support arises (Buffum et al., 2009). Students are not given the option for additional support; those students who need the intervention are not allowed to opt out of the intervention process (Buffum et al., 2009). The interventions are designed to build on each other, from least intensive to most intensive, and if students are unsuccessful in narrowing the achievement gap through tier one interventions they are then placed into the second tier of interventions (Buffum et al., 2009).

Tier two interventions are immediate and powerful, targeted interventions systematically applied and monitored for any students who are not achieving (Buffum et al., 2009). The third and final tier of intervention consists of the most intensive interventions focused on closing the achievement gap and impacts the fewest number of students (Buffum et al., 2009). This level consists of extremely intensive interventions that are provided one-on-one or in a very small group (Buffum et al., 2009). In theory, a small number of students require tier three interventions, as most students should be successful in narrowing the achievement gap through the interventions in tier one and tier two (Buffum et al., 2009).

Impact of Common Core Standards on Academic Interventions

Over the past decade, more and more research has indicated the increased importance of postsecondary education (Robert, 2012). In a 2004 study, labor economists Frank Levy and Richard Murnane found technology is transforming the

workplace by reducing the need for routine skills and placing a premium on problem-solving and communication skills (Robert, 2012). Levy and Murnane projected 62% of jobs in the United States in 2018 will require education beyond high school (Robert, 2012).

According to these findings, the proportion of students with college degrees is not rising fast enough to meet the demand for the U.S. workforce (Robert, 2012). Experts believe one reason for the shortfall in postsecondary success is the inadequate preparation of students in high school (Robert, 2012). There is a growing belief the current K-12 curriculum standards are inadequate, ultimately causing a shortfall in the number of students graduating from high school who are ready for the current U.S. workforce (Robert, 2012).

In order to address this shortfall, state leaders in 2006 began to consider developing standards that would be common among states, not only to reduce variability but also to ensure the expectations match the requirements of postsecondary education (Common Core State Standards Initiative, 2010). In April 2009, the project was launched and divided in two parts (Robert, 2012). First, teams developed anchor standards for college and career readiness in communication arts and mathematics, which indicate the knowledge and skills students need at the end of high school (Common Core State Standards Initiative, 2010).

A second team began the process of designing grade-by-grade standards in math and communication arts that led to the anchor standards (Robert, 2012). The final set of Common Core standards was released in June 2010 (Robert, 2012). According to the design of the Common Core standards, students who meet the standards should be able to

enroll in postsecondary education without needing remediation (Robert, 2012). Students will be ready to enroll in a two- or four-year postsecondary education without remediation, or students will be ready for workforce training (Common Core State Standards Initiative, 2010).

Within the new standards, the reading standards place a heavy emphasis on the ability to comprehend complex text (Common Core State Standards Initiative, 2010). The writing standards reflect college and career readiness by reducing the traditional emphasis on narrative writing and placing a greater emphasis on informational and explanatory writing (Common Core State Standards Initiative, 2010). According to Robert (2012), the mathematics standards are intended for all students and represent the threshold level necessary for college and career readiness. Much of the mathematics necessary for postsecondary success is taught in grades six through eight (Robert, 2012).

Pros of the Common Core standards. Although the topic of the Common Core standards is widely debated, there are some pros of the implementation of the standards. First, the Common Core standards allow all states to compare standardized test scores in an accurate manner (Dalien, 2014). According to Dalien (2014), if each state is teaching the same curriculum, there will be no difference in how test results are measured across the board.

Another pro to implementing the Common Core standards is the point that standards are internationally benchmarked, which means Common Core should compare favorably to the education standards of other countries (Dalien, 2014). Over the years, the United States has dropped in several educational rankings (Chappell, 2013). It is expected the Common Core standards will help improve these results (Dalien, 2014).

Another advantage to the Common Core standards is that states will have a truly common way of comparing themselves (Catapano, 2012). This will mean for families always on the move for one reason or another, the Common Core standards will allow children to continue their education right where they left off, no matter in what state they may reside (Dalien, 2014). The new standards also place more accountability on students through testing and homework, which means students can no longer provide a simple right answer for a question (Dalien, 2014). Dalien (2014) went on to state the students must show the process by which they arrived at the answer, eliminating cheating and mathematical calculator work.

Cons of the Common Core standards. Along with the positive views of the Common Core curriculum, there are also negative views as well. The Common Core standards are broad and vague, which can lead to confusion in how the curriculum should be taught (Dalien, 2014). While there are definite rules for education regarding children up until grade eight, it seems that grades nine through 12 do not have any set regulations or content that needs to be provided, which is then left up to the school's discretion (Dalien, 2014).

Implementing the Common Core standards requires a significant amount of professional development for certified staff because of the shift in the type of questions that need to be posed to students (Conway, 2013). The Common Core also relies heavily on technology to complete the outlined curriculum (Conway, 2013). This, along with the professional development needed for staff, places a heavy financial burden on schools as computers and other technological media replace textbooks (Dalien, 2014). Another con to the implementation of the Common Core standards is the tendency for any subject

aside from mathematics and language arts to be sacrificed to make time for more preparation on the standards (Munoz, 2014). According to Dalien (2014), the Next Generation Science Standards were introduced in 2013; however, they do not directly relate to Common Core standards.

The Common Core assessment tests are not designed for children with special needs, nor is there an equivalency test (Common Core State Standards Initiative, 2010). This means that when a school reports their test scores, 100% accountability goes to each and every student, regardless of disability (Dalien, 2014). Dalien (2014) also pointed out the concern educators will step down from their positions to pursue other educational avenues due to the difficult transition to the Common Core standards.

With the new emphasis on college and career readiness with the Common Core standards, teachers must be prepared to teach the standards. Also, appropriate assessments must be in place to measure if students are attaining the standards (Hwang, McMaken, Porter, & Yang, 2011). With the emphasis placed on the Common Core standards, many schools are taking measures to build interventions into the school day in order to allow faculty the opportunity to work with students who are falling behind the grade-level expectations (Burns & Gibbons, 2013). If this does not occur, students will fall further behind and struggle even more in high school with the new standards.

According to a recent study, middle grades are the last chance to identify students at risk of academic failure and get them back on track in time to succeed in high school (Trish et al., 2011). Due to this fact, schools hosting the middle grades are beginning to place an emphasis on interventions that have a positive impact on the performance of all students enrolled in the building (Trish et al., 2011). In an attempt to identify the

educational practices that positively impact student outcomes in the middle grades, EdSource and Stanford University conducted a study of 303 middle grade schools in California during the 2008-2009 school year (Trish et al., 2011). It is important to note the researchers did not find a consistent or strong association between student outcomes on standards-based tests and school grade configuration or organizational models of teachers and instruction (Trish et al., 2011).

MSIP 5 Impact on Academic Interventions

Missouri School Improvement Program cycle five (MSIP 5) is also placing a larger emphasis on classroom interventions. The Missouri School Improvement Program has been in place for over 20 years and focuses on school improvement to ensure a quality public education system is available for its citizens throughout the state (MODESE, 2014). The fifth cycle of the Missouri School Improvement Program focuses on the following goals:

- To articulate the state's expectations for districts in driving actions for improving student achievement with the ultimate goal of all students graduating ready for success in college and careers.
- Distinguish performance of schools and districts in valid, accurate and meaningful ways so that districts in need of improvement can receive appropriate support and interventions to meet expectations and high-performing districts can be recognized as models of excellence.
- Empower all stakeholders through regular communication and transparent reporting of clear data on performance and results, so that they can take action appropriate to their roles.

- Promote continuous improvement and innovation within each district on a statewide basis to advance the opportunity for success for each student.
- Establish the state's expectations for districts in driving actions for moving student achievement to top ten status with the ultimate goal of all students graduating ready for success in college and careers. (MODESE, 2011, p. 1)

These are the goals for which school districts will be held accountable by the MODESE (2011).

In order to meet the goals of MSIP 5, the MODESE has developed several process standards which districts are expected to meet (MODESE, 2011). Many of these standards directly impact the way schools intervene with struggling students (MODESE, 2011). The following standards all impact the way schools approach academic interventions:

1. The board of education adopts and district staff implement, review and revise a rigorous, guaranteed and viable curriculum for all instructional programs. Requiring staff identify essential content and skills that all students should know and be able to do.
2. The district administers state-required tests and other assessments and uses disaggregated and longitudinal data to inform and adjust curriculum and instructional practices.
3. Instructional staff use effective assessment practices to monitor student learning and adjust instruction. (MODESE, 2014, p. 9)

These are the standards for which school districts will be held accountable. However, the process standard that has the biggest impact on academic interventions is the following standard:

1. Instructional staff routinely provide effective instruction designed to meet the needs of all learners.
 - a. In order to accomplish this, instructional staff use evidence-based instructional practices to meet the learning needs of all students.
 - b. Instruction is routinely differentiated to address the needs of all students.
 - c. Instructional staff routinely use student data to provide interventions to address a continuum of student needs. (MODESE, 2014, p. 6)

This is the first time in the 20-plus year history of the Missouri School Improvement Program a standard specifically emphasizes the interventions a district must put in place to meet student needs (MODESE, 2012a). By addressing this, the MSIP 5 document requires districts to research ways in which intervention programs may better meet the academic needs of a district's students.

Summary

There are several factors which have caused an increased emphasis on academic interventions in public schools. One of these factors is the growth and success of interventions that have been implemented by schools through the RtI process. Although these interventions initially were developed for the special education environment, studies have indicated the RtI model has had success improving student growth in the general education setting as well (Burns & Gibbons, 2013).

The expansion of the Professional Learning Community philosophy has also increased the emphasis on academic interventions. In an attempt to address the third corollary question of a PLC, many schools have begun implementing an academic intervention program (DuFour & Fullan, 2013). Through collaboration and analysis of student data from formative and summative assessments, many schools are taking the approach that providing time for academic interventions with students will significantly improve student achievement.

Process standard nine of the MSIP 5 cycle specifically states instructional staff are expected to routinely use student data to provide interventions to address a continuum of student needs (MODESE, 2011). With this integration of the MSIP 5 cycle, schools that are not implementing RtI or PLC will have to consider what interventions they offer to students who are in need of academic assistance. With the emphasis placed on academic interventions, it is important for school districts to identify what characteristics of an intervention program are successful. The intent of this study was to identify those qualities.

In the next chapter, the methodology of the study is discussed including how the data were collected. Next, the academic achievement and the results of the middle school building surveys are analyzed. Then, an analysis of the demographics of the surveyed middle schools is considered in Chapter Four. Finally, in Chapter Five a summary of all the findings related to the study is provided.

Chapter Three: Methodology

As schools across the country look for different approaches to narrow the student achievement gap and meet the accountability standards set forth by NCLB, many of these schools are becoming Professional Learning Communities, or PLCs (McLaughlin & Talbert, 2006). As schools try to answer PLC corollary question number three (How will we respond when a student experiences difficulty in learning?), many of these schools have developed a pyramid of intervention (Buffum et al., 2009). A pyramid of intervention allows educators to identify students in need and to assign proper intervention strategies to ensure better understanding and mastery of objectives (Buffum et al., 2009).

According to Burns and Gibbons (2013), “Research has consistently found that RtI initiatives lead to gains in student achievement and school wide improvements, such as reduced referrals to and placements in social education and a higher rate of students scoring proficiently on state tests” (p. 382). Burn’s research was focused on elementary-aged students receiving RtI prior to middle school (Burns & Gibbons, 2013). The International Reading Association Commission on RtI (2009) suggested secondary-level [to include middle school] educators should not institute RtI based on elementary approaches.

The research of this study was quantitative in nature. Quantitative research is used to answer questions about the measured differences between variables with the purpose of explaining, predicting, and controlling phenomena (Leedy & Ormrod, 2014). A quantitative study was used, because this study involved comparison of MAP communication arts index scores of middle schools which have adopted the PLC model

and have implemented RtI and non-PLC middle schools that may not have implemented a systemic process of academic interventions. The methods used to collect, sort, and analyze the data indicating the difference between student achievement growth of the two groups are described in this chapter. Included in Chapter Three are the problem and purpose overview, research questions, research design, population, sample, instrument, and method for collection of the data.

Problem and Purpose Overview

The purpose of this study was to examine the Missouri Assessment Program (MAP) communication arts index scores for 2011, 2012, and 2013 of PLC middle schools that have implemented RtI and non-PLC middle schools that may not have implemented a systemic process of academic interventions. Also, a three-year review of the academic intervention components implemented through the PLC process in middle schools achieving above the Missouri average in the area of communication arts was conducted. This process identified the difference, if any, in the effectiveness of interventions when developed collaboratively through the PLC process.

By identifying the parts of an intervention program that show a correlation to student achievement, school districts will have more success in developing interventions that will impact the students within their schools (DuFour et al., 2009). Summative assessment results from the participating schools were collected to determine which interventions have the greatest correlation to student achievement. The MAP index scores were the summative assessment used to analyze growth in student achievement. Being able to identify successful components will also improve a teacher's ability to help students meet the given objectives of a course (Buffum et al., 2010). Middle schools take

on a different learning environment compared to elementary schools; therefore, it is important to identify what works best at the middle school level (Brozo, 2009).

Research questions and hypothesis. The following research questions and hypothesis guided this study:

1. What is the statistical difference between the Missouri Assessment Program (MAP) communication arts index scores of middle schools that have adopted the Professional Learning Community (PLC) model and have implemented Response to Intervention (RtI) and non-PLC schools that may not have implemented a systemic process of academic interventions, over a three-year period?

H1o: There is no statistical difference between the Missouri Assessment Program (MAP) communication arts index scores of middle schools that have adopted the Professional Learning Community (PLC) model and have implemented Response to Intervention (RtI) and non-PLC schools that may not have implemented a systemic process of academic interventions, over a three-year period.

2. What components of academic interventions are implemented in middle schools that have adopted the PLC model and have achieved above the Missouri average on the MAP communication arts index scores over a three-year period?

Research Design

The MAP scores from each participating school district were analyzed to determine the impact RtI programs have on improving a school district's summative assessment scores. The three-year MAP index average of PLC middle schools was compared to the MAP index three-year average of non-PLC middle schools to determine if RtI in PLC middle schools led to increased student performance. Surveys were then

sent to principals from the participating school districts. The survey questions were developed to gather input from the principals regarding their perceptions of the interventions and the impact interventions have on improving student achievement (Fisher & Frey, 2013).

Population

A population consists of all the possible subjects or cases of interest (Salkind, 2013, p. 387). The population of this study was 76 middle-level schools in the state of Missouri that have been through regional PLC training and have already implemented a pyramid of intervention within the school districts. The demographics of the school districts ranged from rural schools throughout the state to PLC schools that are located within urban areas. The principals of these schools were surveyed to determine the characteristics of their pyramid of interventions.

Sample

The participants in the study were a sample of middle school administrators from across the state in schools which implemented RTI within the schedule. The students had also participated in the MAP test. Principals from each participating district were surveyed to determine the characteristics implemented within that district's intervention program.

The sample size of the study was determined by the results received from surveys sent to 76 administrators of PLC school districts across the state of Missouri. Of all principals surveyed, 30-50 needed to participate in order to have a sufficient sample size for the study (Bluman, 2013). A total of 30 principals agreed to participate in the survey.

Instrument

The data collection instruments used in the study consisted of MAP index scores from participating schools. Survey questions (see Appendix A) were developed to gather input from the principals regarding their perceptions of the interventions and the impact interventions have on improving student achievement. Survey questions were created based on findings from relevant literature (Sansosti et al., 2010). Initial questions were field-tested by colleagues not involved in the study for clarity, understanding, and intent. The survey consisted of 11 multiple-choice questions and provided data showing the frequency with which different academic interventions were implemented. A coding system was utilized to assure the responses to the survey questions remained anonymous.

Data Collection

Approval from the Lindenwood University Institutional Review Board (IRB) was received (see Appendix B). Administrators from 76 Missouri middle schools, who have received PLC training through the RPDC, were asked to participate in the survey. The researcher contacted the Missouri RPDC to identify the districts in the state that had received PLC training. Of the 76 administrators who were asked to participate (see Appendix C), 30 administrators consented (see Appendix D) to participate in the study. The MAP mean scale scores for middle schools were gathered for 2012, 2013, and 2014 from the MODESE website. Additionally, a random sampling of all of the other districts in Missouri was used to identify 30 non-PLC school districts to survey. A *t*-test for independent samples was used to compare the mean communication arts index scores of PLC and non-PLC schools (Bluman, 2013).

The survey was administered, electronically, to building principals from the population. As the educational leaders of the buildings (Blase & Blase, 2012), principals were chosen to complete the survey in order to determine what academic interventions were being implemented in each school. Surveys that were returned from the administrators were coded to match with the MAP results from the same districts.

Descriptive statistics. Frequency charts were used to display the results gathered from the surveys. Data were displayed using bar graphs and frequency charts (Salkind, 2013).

Survey. Surveys were used to collect data (Bluman, 2013). The researcher developed a survey which was utilized to gather the perceptions of principals regarding the evaluation of the pyramid of intervention in place within their districts (Buffum et al., 2009).

Statistical *t*-test. A *t*-test is a statistical test for the mean of a population, used when the population is normally distributed, the population standard deviation is unknown, and the sample size is less than 30 (Bluman, 2013). The *t*-test was utilized to analyze if there was a high level of significance between the different implementations of RtI used throughout the participating districts and what impact that had on student achievement.

Ethical Considerations

Coding systems were used on all student scores to guarantee confidentiality. Surveys received from principals were also assigned codes to ensure anonymity. All efforts were made to ensure the security and confidentiality of all records. No

participants in the survey were introduced to research that might cause any harm to the individual.

Summary

This study was conducted, in a quantitative manner, to compare MAP communication arts index scores of PLC middle schools which have implemented RtI and non-PLC middle schools that may not have implemented a systemic process of academic interventions. Buildings selected to be in the study contained seventh and eighth grades and had received PLC training.

There are 76 public school districts in the state of Missouri that have received PLC training and contain seventh- and eighth-grade students. A survey was sent to the building principals of these schools to gather data about the RtI programs in their buildings. Of these 76 schools, 30 responded to the survey. The communication arts three-year MAP index average was calculated for the 30 participating schools. Three-year MAP index averages were also calculated for 30 non-PLC schools which were randomly chosen. The three-year MAP index averages were compared to determine if there is a statistical difference between the MAP communication arts index scores of middle schools that have adopted the PLC model and middle schools that have not adopted the PLC model.

Surveys were also used to identify specific characteristics of the interventions that are in place within the participating school districts. The surveys also revealed the principals' perspectives on the interventions that are incorporated. A comparison of the data allowed for identification of the most productive characteristics of an intervention program that improves student achievement.

In the following chapter, an analysis of the data gathered in the study is presented. The MAP index scores for PLC and non-PLC schools were analyzed and compared to determine the statistical difference between each population. Survey results were tallied from each participating building and analyzed to determine which academic intervention characteristics are prevalent in schools that have higher MAP index scores in communication arts. Once this was completed, demographics analysis was also reviewed of the 30 PLC schools. This analysis was used to compare the demographics of the 30 PLC schools and the interventions that are implemented.

Chapter Four: Analysis of Data

This study involved a review of data from PLC middle schools in the state of Missouri that have implemented RtI programs within the school day. The researcher also examined the Missouri Assessment Program (MAP) index scores in communication arts for years 2012, 2013, and 2014 of the schools participating in the study. The scores were compared to scores from a random sampling of 30 non-PLC middle schools in the state which may not have implemented a systemic process of academic interventions. This was completed to determine if there is a statistical difference in MAP index scores of schools that have implemented RtI using the PLC model and those non-PLC schools which may not have implemented a systemic process of academic interventions.

A three-year review of RtI components implemented through the PLC process in middle schools achieving above the Missouri average in the area of communication arts was conducted. This process allowed for identification of what components of an RtI program have a positive effect on student achievement. Differences were identified in the success of interventions developed through the PLC process when compared to schools which may not have implemented a systemic process of academic interventions.

Additionally, summative assessment results from the participating schools were collected to determine which interventions have the greatest correlation to student achievement. The MAP index three-year average of PLC schools was compared to the MAP index three-year average of non-PLC schools to determine if RtI programs implemented in PLC schools led to an increase in student performance on the MAP test. Therefore, the purpose of this study was to determine what characteristics of RtI are being implemented in high-achieving middle schools.

Survey Process

To gather data on RtI programs that have been implemented in middle schools, a survey instrument was developed for the study. Building principals were selected to respond to the survey, because as the educational leaders of the buildings, they would have the best understanding and knowledge of any interventions being implemented in their buildings. Their knowledge of the interventions provided insight into what level of implementation exists within the buildings. The individuals recruited to take part in this survey were building principals of middle schools that house seventh- and eighth-grade students and whose districts have received PLC training through the regional RPDCs. The survey administered to the building principals was developed through Google Forms.

The survey was developed to determine what characteristics of interventions were present in the RtI programs in each building. All building principals were recruited through an electronic letter of introduction to participate in the survey. The survey was developed in a manner conducive with purposive sampling. The survey consisted of 11 questions. By clicking on the link that was attached to the electronic letter, the principal voluntarily agreed to participate in the study. The respondent was then asked a series of information-gathering questions related to the components of the RtI program implemented within their buildings.

Building principals were provided a series of multiple choice answers in relation to each of the 11 survey questions. The multiple choice-style questions provided data which showed the frequency with which each characteristic of a response to intervention program was implemented throughout the surveyed buildings. The survey questions also provided demographic data for each building.

In Missouri, 259 schools had received PLC training through regional RPDCs. Of the 259 schools which had received PLC training, 76 were buildings which contained seventh- and eighth-grade students. The building principals from each of these 76 schools received the request to complete the survey through an introductory email. Initially, nine principals responded to the request to complete the survey. Additional email requests and phone calls were made to the remaining 67 principals, which resulted in a total of 30 principals completing the survey.

By completing the survey, the 30 principals agreed for their school districts to participate, and this identified the 30 PLC school districts that would be a part of the study. A random sampling of all of the other districts in Missouri identified the 30 school districts that made up the data set of non-PLC schools that would be a part of the study. The list of non-PLC schools that was randomly chosen was then cross-referenced with the list of schools that had received PLC training to determine if any of the schools were on both lists.

Four school districts were identified as having received PLC training. Those schools were removed from the study, and an additional random sampling of school districts was performed in order to identify 30 school districts to include in the study that had not received PLC training. This process provided for a group of 30 PLC schools and 30 non-PLC schools to participate in the study.

The researcher then gathered 2012, 2013, and 2014 MAP index scores for each PLC and non-PLC school that was part of the study. These scores were accessed from each district's Achievement Level 4 Public Reports, located in the Missouri Comprehensive Data System on the MODESE website (MODESE, 2014). Table 1

represents the 2012, 2013, and 2014 MAP index scores for the 30 schools which made up the PLC group for the study. Table 2 represents the 2012, 2013, and 2014 MAP index scores for the 30 schools which were randomly chosen to make up the non-PLC group for the study. The mean and standard deviation were then calculated for the 2012, 2013, and 2014 MAP results for each school in the PLC group and non-PLC group (see Table 3).

Table 1

MAP Index Scores for PLC Schools

Building	2012	2013	2014
1	294.6	295.5	318.2
2	342.7	338.9	340.2
3	358.2	346.7	350.7
4	350.0	367.2	367.7
5	363.7	364.6	364.6
6	352.3	334.9	307.3
7	367.7	387.4	382.7
8	391.2	392.1	389.5
9	330.6	341.2	320.7
10	368.8	360.9	356.5
11	357.0	364.6	354.7
12	359.9	366.3	360.1
13	383.4	383.0	380.0
14	376.5	382.0	369.4
15	337.2	330.8	329.5
16	357.2	333.9	347.5
17	372.9	373.2	371.9
18	364.0	372.1	372.6
19	394.4	393.9	398.1
20	382.0	385.4	382.1
21	349.2	352.2	354.2
22	387.9	396.4	383.1
23	343.0	338.9	329.8
24	317.3	311.3	299.7
25	373.5	378.1	373.3
26	362.5	372.0	367.7
27	358.7	350.3	353.3
28	364.7	367.7	367.5
29	366.7	360.8	351.2
30	341.0	323.8	327.9

Note. MAP index scores were collected for buildings whose principals completed the survey. These scores indicated the level of academic achievement for each building on the 2012, 2013, and 2014 communication arts MAP test.

Table 2

MAP Index Scores for Non-PLC Schools

Building	2012	2013	2014
A	342.1	350.8	332.1
B	237.3	235.7	235.4
C	346.6	349.4	355.3
D	351.1	357.1	361.4
E	372.5	376.4	376.9
F	359.1	360.7	360.6
G	334.7	327.6	343.7
H	386.3	382.5	371.8
I	367.5	366.8	372.9
J	358.4	361.4	346.6
K	365.9	364.8	371.9
L	365.5	364.3	360.4
M	366.3	363.2	360.2
N	375.9	383.1	370.3
O	367.7	374.6	368.6
P	368.4	376.6	361.1
Q	360.8	358.5	354.2
R	365.9	360.9	356.2
S	351.8	362.0	361.7
T	343.7	342.2	337.1
U	370.2	374.0	362.8
V	373.4	378.7	379.9
W	343.0	349.7	348.3
X	359.9	360.7	364.0
Y	370.3	367.8	376.0
Z	372.1	361.7	368.9
AA	356.5	354.1	350.0
BB	363.5	362.1	361.8
CC	303.5	299.6	298.6
DD	346.5	335.8	327.2

Note. MAP index scores were collected for buildings which were randomly chosen to be part of the non-PLC group. These scores indicated the level of academic achievement for each building on the 2012, 2013, and 2014 communication arts MAP test.

Table 3

Average MAP Index Scores in ELA for PLC and Non-PLC Schools

	PLC (<i>n</i> = 30)		Non-PLC (<i>n</i> = 30)		<i>t</i> -test
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i> (62)
Com. Arts 2012	358.96	-21.6	354.45	-26.8	0.718
Com. Arts 2013	358.87	-25.22	355.17	-28.12	0.537
Com. Arts 2014	355.72	-24.83	353.13	-27.94	0.38

Initial analysis of the three-year communication arts scores indicated schools of the PLC group outperformed schools from the non-PLC group. In 2012, the mean MAP index score in communication arts for PLC schools was 358.96 compared to the mean MAP index score in communication arts for non-PLC schools of 354.45. In 2013, the mean MAP index score in communication arts for PLC schools was 358.87 compared to the mean MAP index score in communication arts for non-PLC schools of 355.17. In 2014, the mean MAP index score in communication arts for PLC schools was 355.72 compared to the mean MAP index score in communication arts for non-PLC schools of 353.13.

For the three years included in the study (2012, 2013, and 2014), the mean MAP index score in communication arts for PLC schools was 357.85. For the three years included in the study (2012, 2013, and 2014), the mean MAP index score in communication arts for non-PLC schools was 354.25. These data show the MAP index scores in communication arts for the PLC group were, on average, 3.6 points higher than the MAP index scores in communication arts for the non-PLC group during the three-year time span.

A *t*-test was then run to determine if there was a significant difference in MAP performance index scores for 2012, 2013, and 2014 between PLC schools and non-PLC schools. When using the 2012 MAP communication arts data, the *t*-test was calculated to find a *p*-value of .718. When using the 2013 MAP communication arts data, the *t*-test was calculated to find a *p*-value of .537. When using the 2014 MAP communication arts data, the *t*-test was calculated to find a *p*-value of .38. The MAP index values for all the years which were included in the study resulted in *p*-values greater than .05. Therefore, after running the *t*-test for each year, it was determined there was not a significant difference between the MAP scores of schools in the PLC group and schools in the non-PLC group.

Although the results of the *t*-test indicated there was not a significant difference between the MAP scores of the PLC group and non-PLC group, it was evident the PLC group had a slightly higher mean score in each year of MAP testing. Additional demographic data were pulled for each school in both the PLC and non-PLC groups to further analyze the results. For each school included in the survey, the following additional demographic data were collected from the Missouri Comprehensive Data System on the MODESE website: school enrollment, ethnicity (percentage of Caucasian students), average daily attendance, percentage of students eligible for free or reduced price meals, student-to-classroom teacher ratio, and average years of experience of professional staff (see Table 4 and Table 5).

Table 4

Demographic Data for PLC Schools

Building	Enroll.	Eth. %	Att. %	FR Ratio	Ratio	Exp.
1	947	9.7	72.2	84.7	18	9.5
2	693	93.9	86.4	54.0	17	13.2
3	100	96.0	95.7	64.4	12	11.9
4	193	98.4	90.7	54.9	15	8.2
5	366	95.6	89.8	37.8	22	14.1
6	63	96.8	84.1	55.8	8	9.0
7	268	94.4	87.8	67.6	15	14.0
8	644	84.2	91.4	15.1	17	11.3
9	687	8.6	82.2	71.1	15	13.6
10	370	95.7	89.2	75.8	20	11.2
11	622	80.7	92.6	63.5	19	11.1
12	666	82.3	92.1	50.3	18	11.0
13	749	92.8	89.5	31.8	20	12.0
14	729	91.2	94.6	41.0	20	12.7
15	307	67.4	92.6	81.6	17	16.2
16	193	96.4	93.1	66.3	14	9.1
17	388	98.2	86.8	70.8	17	15.1
18	349	95.1	85.8	61.4	18	13.7
19	867	91.1	91.5	34.2	18	14.3
20	850	90.7	91.0	33.6	17	13.0
21	529	95.3	92.6	64.3	16	13.1
22	723	83.0	85.3	52.5	21	12.7
23	499	77.6	81.0	72.9	19	13.5
24	407	74.2	75.9	88.0	16	12.8
25	709	89.1	92.9	34.2	19	15.7
26	326	96.0	94.6	44.2	17	11.3
27	185	96.8	89.4	75.1	15	12.6
28	720	93.6	90.8	47.9	18	12.4
29	593	92.2	90.8	50.7	18	9.9
30	235	92.3	84.0	63.7	15	7.2

Note. Enroll = building enrollment; Eth. % = percentage of Caucasian students; Att. % = average daily student attendance; FR Ratio = percentage of students eligible for free or reduced price meals; Ratio = ratio of students per certified teacher; Exp. = average years of experience per certified teacher.

Table 5

Demographic Data for Non-PLC Schools

Building	Enroll.	Eth. %	Att. %	FR Ratio	Ratio	Exp.
A	586	55.6	92.6	67.2	15	12.2
B	278	1.4	66.9	94.1	24	12.0
C	586	55.6	92.6	67.2	15	12.2
DD	311	94.2	91.7	52.1	16	11.1
E	229	94.8	92.5	41.2	18	10.1
F	387	68.5	88.5	59.8	18	10.9
G	379	84.4	85.2	71.1	15	11.2
H	687	87.8	96.0	49.0	20	10.1
I	327	95.7	93.5	34.4	17	10.0
J	813	85.7	84.4	62.0	20	13.1
K	332	96.1	94.4	46.0	17	14.0
L	471	94.9	92.3	57.1	17	12.0
M	920	52.8	83.3	41.9	18	12.1
N	642	93.8	86.9	54.9	16	13.8
O	59	100.0	92.3	59.6	14	12.5
P	532	79.7	89.1	45.4	14	14.7
Q	946	73.2	87.3	54.5	19	12.9
R	975	64.3	91.2	52.7	19	13.5
S	217	98.6	91.4	59.6	20	9.6
T	309	66.7	91.6	70.3	14	14.0
U	617	88.5	90.9	27.3	16	11.5
V	283	89.8	96.1	21.9	13	10.4
W	1471	88.5	87.2	44.3	22	10.6
X	331	90.6	90.4	37.1	18	12.7
Y	349	91.1	89.3	49.0	18	14.9
Z	575	92.0	92.5	47.2	18	14.9
AA	433	95.6	93.0	71.3	18	11.8
BB	499	96.0	96.3	47.8	19	15.7
CC	592	5.2	90.1	92.0	21	9.4
DD	239	64.0	90.8	66.5	15	13.6

Note. Enroll = building enrollment; Eth. % = percentage of Caucasian students; Att. % = average daily student attendance; FR Ratio = percentage of students eligible for free or reduced price meals; Ratio = ratio of student per certified teacher; Exp. = average years of experience per certified teacher.

Once the demographic data were pulled for each PLC and non-PLC school, the mean and standard deviation (see Table 6) for each category were calculated in order to compare the overall demographics of each group included in the study.

Table 6

Demographic Characteristics of PLC and Non-PLC Schools

	PLC (n =30)		Non-PLC (n =30)	
	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>
Enrollment	499.23	-246.86	512.5	-291.41
Attendance %	88.55	-5.44	90.01	-5.45
Free/Red. %	56.97	-17.65	54.82	-16.25
White %	84.98	-21.96	78.17	-24.76
Teacher-Student	17.03	-2.77	17.48	-2.57
Experience	12.18	-2.17	12.25	-1.72

Note. Attendance % = Average Daily Attendance of all students enrolled. Free/Red. % = the percentage of enrolled students which qualify for either free or reduced price meals based on household income. White % = the percentage of students who enrolled claiming Caucasian as their primary ethnicity. Teacher-Student = the ratio of the number of students per teacher employed in the school. Experience = the average number of years of experience per certified staff member.

When reviewing the demographic data of the PLC group versus the non-PLC group, there was not a significant difference in the demographics of the two groups being compared in the study. Schools identified as non-PLC schools had an average of 13.27 more students compared to the average enrollment of PLC schools. Non-PLC schools also had a 1.46% higher average daily attendance and a 2.15% lower percentage of students who qualify for free or reduced price meals when compared to the schools in the PLC group. Ultimately the data indicate the schools that participated in the study and

make up the PLC group and non-PLC group are statistically similar based on demographic data. The similarities in the demographic data suggest the academic intervention programs which have been implemented through the collaboration process followed by PLC schools may account for the slight increase in yearly MAP index scores in communication arts.

Analysis of Survey Responses

Those building principals who agreed to participate in the survey were asked a series of 11 multiple choice questions. The intent of the survey questions was to gather data on the characteristics of the RtI programs which have been implemented in each building.

Survey question 1. What is the name of your school building?

This question was asked to determine school districts that were willing to participate in the study. From the responses, 30 schools were identified as PLC schools which incorporate an RtI program in their daily schedules.

Survey question 2. How many students are enrolled in the school building?

This question was asked to identify the size, based on student enrollment, of each school participating in the study. This information was used to determine if districts have an advantage on student assessments based on size. Schools that have a larger enrollment also have a larger teacher population. This may allow the district the opportunity to provide more options to students during the RtI period. Those surveyed were asked to choose which of the following categories describe their school based on student enrollment: less than 250; between 250-500 students; between 501-750 students; or more than 750 students. Of the 30 schools that participated in the survey, five schools (17%)

responded they have a student enrollment of less than 250 students, whereas 16 schools (53%) responded they have a student enrollment of greater than 500 students (see Table 7).

Table 7

Size of PLC Schools in Sample

	Number	Percentage
< 250 students	5	16.70%
250-500 students	9	30.00%
501-750 students	9	30.00%
>750 students	7	23.30%

Survey question 3. How many years has your school been a member of a Professional Learning Community?

Principals were given the following options from which to choose: one year, two years, or three or more years. This question was asked to determine if the schools participating in the study have varying levels of experience being PLC schools. Schools that have been following the PLC model for a longer period of time would have had more time to develop a collaborative environment in the school setting. Through this collaborative process, educators would have a greater opportunity to research what elements of an RtI program would provide the best support to their students mastering learning objectives.

Twenty-six (92.9%) of those who answered this question responded by saying they had been a part of a PLC for three or more years. Two principals (7.1%) indicated

their buildings had been a PLC school for two years. Two participants of the study failed to provide data for the question.

Survey question 4. How many years has an intervention system been implemented?

Question four was a follow-up question to question three. Principals were asked to choose from the following responses to describe the years during which an RtI system had been in place in their buildings: one year, two years, or three or more years. Of those surveyed, four (14.3%) answered an RtI program had been implemented for one year in their respective buildings. An additional four (14.3%) answered an RtI system had been implemented in their buildings for two years. Twenty principals responded (71.4%) they had been implementing RtI in their buildings for three or more years. Two of those surveyed did not provide data to the question that was asked. Table 8 represents the responses to questions three and four of the survey.

Table 8

Years as PLC School and Years Implementing Interventions

	PLC		Interventions	
	Number	Percentage	Number	Percentage
1 year	0	0.00%	4	14.30%
2 years	2	7.10%	4	14.30%
3+ years	26	92.90%	20	71.40%

Survey question 5. How many times per week does the intervention period meet?

Principals were given the following options from which to choose for a response: interventions are scheduled 1-2 days per week; interventions are scheduled 3-4 days per week; or interventions are scheduled 5 days per week (see Table 9 for results). Fifteen principals (53.6%) responded RtI is provided five days of the week. Only four responded (14.3%) interventions meet two or fewer times each week. Two participants did not respond to the survey question. Based on the results of this data, 85.7% of the PLC schools provide interventions for a minimum of three days per week.

Table 9

Days Per Week Interventions Are Scheduled

	Number	Percentage
1-2 days	4	14.30%
3-4 days	9	32.10%
5 days	15	53.60%

Survey question 6. How many minutes per week are students in a structured intervention period?

Principals were asked to choose among the following options to the question: less than 45 minutes per week of intervention, between 45-70 minutes per week of intervention, between 70-95 minutes per week of intervention, between 95-120 minutes per week of intervention, or greater than 120 minutes per week of intervention (see Table 10).

Table 10

Minutes Per Week Students Receive Interventions

Time	Number	Percentage
<45 minutes	8	28.60%
45-70 minutes	8	28.60%
70-95 minutes	2	7.10%
95-120 minutes	4	14.30%
>120 minutes	6	21.40%

Two participants did not respond to the question, and of those who responded 57.2% stated the students in their schools attend academic interventions less than 70 minutes per week. This would be an average of 15 minutes or less per day. However, 21.4% of the principals stated the students attend interventions more than 120 minutes per week, which averages out to 24 minutes per day.

Survey question 7. At what time is the structured intervention scheduled?

The following options were given as responses: interventions meet prior to first period, interventions meet after last period, or the structured intervention meets during the middle of the schedule. The majority of principals who responded (67.9%) answered that their interventions take place at some point during the school day (see Table 11). Of those who answered this question, only one district responded by stating RtI takes place prior to first period.

Table 11

Time Period Interventions Are Scheduled

Time	Number	Percentage
Before first period	1	3.60%
After last period	8	28.60%
During the day	19	67.90%

Survey question 8. Does the intervention program have a supplemental enrichment or privilege time component?

This yes or no question was asked of the principals in order to identify if schools implement enrichment programs along with the response to intervention that takes place with students. Table 12 shows the results of the responses to the question.

Table 12

Providing Enrichment

	Yes	No
Enrichment	64.30%	35.70%

Note. Table 12 depicts the responses to survey questions 8 and 11 based on the survey sent to principals of PLC schools which participated in the study.

It was necessary to identify these data in order to determine if PLC schools that incorporate an enrichment program yield higher scores on MAP assessments when compared to PLC schools that do not offer an enrichment program in addition to the RtI that is incorporated into their daily schedules. Nearly two-thirds of the principals who responded to the question stated they do include an enrichment program within their daily

schedules. The intent of the enrichment program is to complement learning activities taking place within the RtI classrooms.

Survey question 9. How are students identified for intervention placement?

This question was asked in order to try to identify if districts place an emphasis on mastery of learning objectives when identifying students for academic support during the intervention periods. Table 13 shows the results to this question. Seventeen principals (63%) responded students are placed in RtI based on mastery of learning objectives.

Table 13

Identification and Placement of Students

	Number	Percentage
Grades	5	18.50%
Objectives	17	63.00%
Other	5	18.50%

Of the remaining responses, 18.5% responded by saying students were placed in RtI based on their course grades.

Survey question 10. How frequently are students rotated during Response to Intervention?

Principals were asked to identify if students were rotated through RtI on a daily, weekly, bi-monthly, or monthly schedule. These data were gathered in order to analyze if the frequency with which students were assigned to RtI would result in higher scores on the MAP assessment. Table 14 shows the results of the answers to this question.

Table 14

Frequency of Interventions

	Number	Percentage
Daily	7	26.90%
Weekly	4	15.40%
Bi-monthly	7	26.90%
Monthly	8	30.80%

Analysis of the data shows 11 of the 26 responses (42.3%) indicated students are rotated through RtI on a minimum of a weekly rotation. However, 57.7% of the districts that responded rotate students through interventions on a cycle that is greater than one week. The question then arises, do students receive better academic support if they rotate through interventions on a more frequent basis?

Survey question 11. Does the intervention program also address missing assignments?

Principals were asked to respond to this question by either, “yes, our RtI program does address missing homework” or “no, our program does not address missing homework.” See Table 15 for the results of the responses to this question. These data were then used to analyze the top-performing schools in the PLC group. The results were compared to determine if the characteristic of providing the students opportunity to make up missing assignments was a common characteristic in the top-performing PLC schools.

Table 15

Providing Enrichment and Addressing Homework

	Yes	No
Enrichment	64.30%	35.70%
Homework	67.90%	32.10%

Note. Table 15 depicts the responses to survey questions 8 and 11 based on the survey sent to principals of PLC schools which participated in the study.

Once the data from the survey had been collected for all of the participating schools, data were then analyzed to determine if one could identify specific characteristics of an RtI program that are common in higher-achieving schools. Research question two asked the following: What components of response to interventions are implemented in middle schools that have adopted the PLC model and achieved above the Missouri average on the MAP communication arts index scores over a three-year period? Table 16 shows a list of the three-year MAP index average of all of the schools in the PLC group when compared to the state's three-year MAP index average in communication arts.

Table 16

PLC Schools' Three-Year MAP Index Average Compared to the State's Three-Year Average

School	MAP Index Three-Year Average
19	395.5
8	390.9
22	389.1
20	383.2
13	382.1
7	379.3
14	376.0
25	375.0
17	372.2
18	369.6
26	367.4
28	366.6
5	364.3
10	362.1
12	362.1
4	361.6
29	359.6
State Avg.	359.5
11	358.8
27	354.1
3	351.9
21	351.9
16	346.2
2	340.6
23	337.2
15	332.5
6	331.5
30	330.9
9	330.8
24	309.4
1	302.8

Of the 30 schools in the PLC group, 17 of the 30 had a three-year average MAP index score which was greater than the state average of 359.5. These 17 schools' three-year average scores ranged from 359.6 to 395.5. The top 20%, six schools, of the PLC group were then identified in order to determine what characteristics they have in common when providing RTI to students. Table 17 shows the demographic data of the six top-performing schools in the PLC group.

Table 17

Demographic Data for Top 20% Achieving PLC Schools

Building	Enroll.	Eth. %	Att. %	FR Ratio	Ratio	Exp.
19	867	91.1	91.5	34.2	18	14.3
8	644	84.2	91.4	15.1	17	11.3
22	723	83.0	85.3	52.5	21	12.7
20	850	90.7	91.0	33.6	17	13.0
13	749	92.8	89.5	31.8	20	12.0
7	268	94.4	87.8	67.6	15	14.0
Avg. of Top 20%	683.5	89.4	89.4	39.1	18	12.9
Avg. PLC Schools	499.23	85.0	88.6	57.0	17.03	12.18

Note. Enroll = building enrollment; Eth. % = percentage of Caucasian students; Att. % = average daily student attendance; FR Ratio = percentage of students eligible for free or reduced price meal; ratio = ratio of students per certified teacher; Exp. = average years of experience per certified teacher.

A few areas stood out when comparing the demographic data for the six top-performing PLC schools to the overall group demographics. First, the average enrollment of the six top-performing schools was 683.5 students compared to the PLC group student enrollment average of 499.23. This is a difference in average student

enrollment of 184.27 students. When looking at the enrollment of each individual school in the top six, all of the schools except one had an enrollment of greater than 600 students. The smallest school in the group had an enrollment of 268 students. If you remove the smallest school from the group, the average student enrollment of the five remaining schools is 766.6 students. That is 267.37 students higher than the average student enrollment of all the schools in the PLC group, indicating schools with a larger student enrollment tend to have higher MAP index scores in communication arts.

Another piece of data that stood out when analyzing the six top-performing PLC schools is the average free and reduced price meals percentage for these schools. The average free and reduced price meals percentage for the top six PLC schools was 39.1% compared to the PLC group average free or reduced price meals percentage of 57%. On average, the six top-performing schools had a free or reduced price meals percentage which was 17.9% less than the PLC group average.

Of the six top-performing schools, only one had a free or reduced price meals percentage greater than the PLC group average; that school's percentage was 67.6%. In fact, three of the six top-performing schools had a free or reduced price meals percentage less than 35%, ranging from 34.2% down to 15.1%. If the school is removed with the highest free or reduced price meals percentage, the remaining top five schools had an average free or reduced price meals percentage of 33.44%, which is 23.56% less than the average of the entire PLC group. Further analysis of the free or reduced percentage data indicates the opposite holds true for PLC schools that fell below the state average on MAP index scores in communication arts (see Table 18).

Table 18

Free and Reduced Priced Meals Percentages for Schools Scoring Below the MAP Index Three-Year Average

School	Free/Red. Percentage
11	63.5
27	75.1
3	64.4
21	64.3
16	66.3
2	54.0
23	72.9
15	81.6
6	55.8
30	63.7
9	71.1
24	88.0
1	84.7
Avg. of the Schools	69.6
PLC Avg.	57.0

Note. Free/Red. % = percentage of enrolled students who qualify for free or reduced price meals. Avg. of the Schools = the average Free/Red. % of the 13 schools scoring below the MAP index three-year average. PLC Avg. = the average Free/Red. % of the PLC schools included in the survey.

Of the 30 schools that made up the PLC group, 13 of the schools had a three-year MAP index average that fell below the state average of 359.5. The free or reduced price meals average of the 13 schools was 69.6%, which was 12.6% higher than the overall average for the entire PLC group. Of those 13 schools only two of the schools had a free or reduced price meals average less than the PLC group average of 57%. Six of the schools had a free or reduced price meals percentage greater than 66%, indicating two-thirds of their student bodies qualify for free or reduced price meals. These data may

indicate schools with a lower percentage of students who qualify for free or reduced price meals tend to have a higher average MAP index score in communication arts.

After comparing the demographics of the six top-performing schools in the PLC group, the researcher then analyzed the results to the survey questions which had been answered by the principals of those six schools. The intent of this analysis was to determine what common characteristics of RtI program are provided by the majority of the six top-performing schools. If there were any common characteristics identified among the six top-performing schools it would indicate those characteristics link to an increase in student performance on MAP index scores in communication arts. Table 19 represents the responses the principals provided to the questions asked on the survey.

Table 19

Intervention Characteristics of Top-Performing PLC Schools

School	Yrs. PLC	Yrs. Int.	Days	Min.	Time of Day	Enrich.	Place.	Freq.	Hmwk
7	3+	3+	5	<45	Middle	No	M. Obj.	Bi-Month	No
8	3+	3+	3-4	<45	End	Yes	M. Obj.	N/A	Yes
13	3+	3+	5	45-70	Middle	Yes	M. Obj.	Daily	Yes
19	3+	3+	5	120+	Middle	No	NA	Monthly	Yes
20	3+	3+	1-2	45-70	End	Yes	Other	Daily	Yes
22	3+	3+	5	45-70	Middle	No	M. Obj.	Monthly	No

Note. Yrs. Int. = number of years interventions have been implemented. Place. = how students are identified for academic interventions. Freq. = how often students are rotated through academic interventions. Hmwk = missing homework is addressed during intervention. M. Obj. = students are identified for academic interventions based on their mastery of learning objectives.

When analyzing the data to the survey questions, all six of the top-achieving schools have been members of a PLC for three or more years. The data also show all six of the schools have provided RtI to students for three or more years. Table 20 shows an analysis of the responses the principals of the top six schools provided compared to the results of the entire PLC group.

Table 20

Years as PLC School and Years Implementing Interventions: Top Schools

	PLC Group		Top-Performing PLC Schools	
	Number of Schools	Provide Intervention	Number of Schools	Provide Intervention
1 yr	0	0.00%	0	0.00%
2 yrs	2	7.10%	0	0.00%
3+ yrs	26	92.90%	6	100.00%

Data show the responses from the six top-performing schools are consistent with the results of the entire population of the PLC group. Although these data do not indicate an advantage to the six top-performing schools, it does show a connection between schools that have performed well on MAP index scores in communication arts and having a PLC environment and RtI in place for an extended period of time. This would suggest as schools have implemented RtI, they are able to then make annual adjustments to the interventions provided in order to better meet the academic needs of the students.

If you look at the same data for the six bottom-performing PLC schools based on MAP index scores in communication arts, it would suggest providing RtI for an extended period of time does correlate to improved MAP index scores (see Table 21). Of the six PLC schools with the lowest MAP index scores, three of the six have had RtI in place for fewer than three years (one school did not answer the survey question). Of those schools, two had only implemented RtI for one year. These data indicate the longer an academic intervention has been implemented, the more time educators have been able to adapt the intervention in order to better meet the academic needs of the students.

Table 21

Years as PLC School and Years Implementing Interventions: Bottom Schools

	Number of Schools	Percentage of Schools
1 yr	2	33.30%
2 yrs	1	16.70%
3+ yrs	2	33.30%

Note. Bottom 6 PLC = PLC schools with the lowest MAP index scores in communication arts.

The next data analyzed were the numbers of days per week interventions are scheduled in the six top-performing PLC schools. Table 22 is a summary of the responses provided by the principals of the top six PLC schools in comparison to the responses of the entire PLC group.

Table 22

Days Per Week Interventions Are Scheduled

	PLC Group		Top 6 PLC Schools	
	Number	Percentage	Number	Percentage
1-2 days	4	14.30%	1	16.70%
3-4 days	9	32.10%	1	16.70%
5 days	15	53.60%	4	66.70%

When comparing the two data sets, there was not a significant difference in the responses from the top six schools in relation to the entire PLC group. It is worth noting four of the six top-performing schools (66.7%) provide RtI to students five days per week, compared to the entire PLC group in which 53.6% of the schools provide RtI to students every day of the week.

The next data analyzed were the minutes per week that are designated for RtI in the six top-performing PLC schools. Table 23 is a summary of the responses provided by the principals of the top six PLC schools in comparison to the responses of the entire PLC group.

Table 23

Minutes Per Week Students Receive Interventions: Top Schools

	PLC Group		Top 6 PLC Schools	
	Number	Percentage	Number	Percentage
< 45 minutes	8	28.60%	2	33.30%
45-70 minutes	8	28.60%	3	50.00%
70-95 minutes	2	7.10%	0	0.00%
95-120 minutes	4	14.30%	0	0.00%
> 120 minutes	6	21.40%	1	16.70%

The data show 83.3% of the top-performing schools allow for 70 minutes or less of RtI time during the school week. If a school provided three days of RtI, that would be a maximum of 23 minutes each day of intervention time. If the students met for RtI every day of the week, it would be a maximum of 14 minutes per day allowed for RtI. Table 24 shows the same data for the six bottom-performing PLC schools (one school did not provide a response to the question on the survey).

Table 24

Minutes Per Week Students Receive Interventions: Bottom Schools

	PLC Group		Bottom 6 PLC Schools
	Number	Percentage	Percentage
< 45 minutes	8	28.60%	33.30%
45-70 minutes	8	28.60%	0.00%
70-95 minutes	2	7.10%	16.70%
95-120 minutes	4	14.30%	16.70%
> 120 minutes	6	21.40%	16.70%

Of the five of the bottom six schools that answered this question on the survey, three allow for 70 minutes or more of intervention time each week for RtI. Based on these data, the conclusion could be made the amount of time designated for RtI has less of an impact on student performance than how the time is used. The data from the top-performing schools indicate RtI can be successful when the time used is being maximized and has a specific focus and objective in place.

The next data analyzed included the time period interventions were scheduled in the school day in the six top-performing PLC schools. Table 25 is a summary of the responses provided by the principals of the top six PLC schools in comparison to the responses of the entire PLC group.

Table 25

Time Period Interventions Are Scheduled

	PLC Group		Top 6 PLC Schools	
	Number	Percentage	Number	Percentage
First period	1	3.60%	0	0.00%
After last period	8	28.60%	2	33.30%
During the day	19	67.90%	4	66.60%

There was not a significant difference between the six top-performing schools and the entire PLC group regarding the time period interventions are scheduled.

The next data analyzed included if enrichment programs were provided and if missing homework was addressed in the six top-performing PLC schools. Table 26 is a summary of the responses provided by the principals of the top six PLC schools in comparison to the responses of the entire PLC group.

Table 26

Providing Enrichment and Addressing Homework

	PLC Group		Top 6 PLC Schools	
	Yes	No	Yes	No
Enrichment	64.30%	35.70%	50.00%	50.00%
Homework	67.90%	32.10%	66.70%	33.30%

There was not a significant difference between the six top-performing schools and the entire PLC group regarding the time period interventions are scheduled.

The next data analyzed included if enrichment programs were provided and if missing homework was addressed in the six top-performing PLC schools. Table 27 is a summary of the responses provided by the principals of the top six PLC schools in comparison to the responses of the entire PLC group.

Table 27

Identification and Placement of Students

	PLC Group		Top 6 PLC Schools	
	Number	Percentage	Number	Percentage
Grades	5	18.50%	0	0.00%
Objectives	17	63.00%	4	66.70%
Other	5	18.50%	1	16.70%

Five of the top schools responded to this survey question. Of the five schools that responded, four schools (66.7%) use mastery of learning objectives to determine a student's placement in RtI. This is consistent with the entire PLC group in which 63% of the schools use mastery of learning objectives to determine a student's placement in RtI. It is also necessary to note that of the top-performing schools that answered this question on the survey, none of them use a student's grade in class to determine that student's placement in an RtI program. This may indicate districts which have higher MAP index scores in communication arts also place an emphasis on standards-based grading and a student's mastery of learning objectives, as opposed to giving a student a letter grade based on the percentage of points that student has earned on his or her assignments in class.

Next, the frequency with which students were rotated through RtI programs was analyzed. Table 28 is a summary of the responses provided by the principals of the top six PLC schools in comparison to the responses of the entire PLC group.

Table 28

Frequency of Interventions

	PLC Group		Top 6 PLC Schools	
	Number	Percentage	Number	Percentage
Daily	7	26.90%	2	33.30%
Weekly	4	15.40%	0	0.00%
Bi-monthly	7	26.90%	1	16.70%
Monthly	8	30.80%	2	33.30%

There was not a significant difference between the six top-performing schools and the entire PLC group regarding the frequency with which students are rotated through RtI. These results would indicate the frequency of how often students are rotated through RtI does not have a positive or a negative impact on student performance. What is important is how students are identified for the interventions and the focus of the activities that take place during RtI.

Summary

A survey was distributed to 76 middle schools, which contained seventh- and eighth-grade students and had received PLC training through their regional RPDCs. Of the 76 buildings, 30 building principals responded to the survey. The survey instrument allowed for identification of the characteristics of the interventions that were implemented within each building. The survey consisted of 11 statements, of which nine related directly to the characteristics of RtI being implemented.

Once survey responses were obtained, MAP data were collected relating each building's student achievement level. The MAP data consisted of each building's MAP index scores in communication arts for the 2012, 2013, 2014 MAP tests. The buildings whose principals responded to the survey made up the PLC group data set. A random sampling of all of the other districts in the state of Missouri identified the 30 school districts that made up the non-PLC group data set. The MAP index scores in communication arts for the 2012, 2013, 2014 MAP tests were also collected for the non-PLC data set.

A *t*-test was conducted to determine if there was a significant difference in MAP index scores for 2012, 2013, and 2014 between PLC schools and non-PLC schools. The data showed the PLC group had a slightly higher three-year MAP index score average compared to the non-PLC group. However, after running the *t*-test for each year, it was determined there was not a significant difference between the MAP scores of schools in the PLC group and the non-PLC group.

For each school included in the survey the following additional demographic data were gathered: school enrollment, ethnicity (percentage of Caucasian students), average daily attendance, percentage of students eligible for free or reduced price meals, students-to-classroom teacher ratio, and average years of experience of professional staff. The demographic data were retrieved from the Missouri Comprehensive Data System on the MODESE website. The mean and standard deviation for each demographic category was calculated in order to compare the overall demographics of each group included in the study. The demographic data showed there to be no significant difference in the two groups included in the study.

The survey responses, provided by the principals of the schools in the PLC group, were then examined to determine the frequency with which each RtI characteristic was being implemented in each building. The top 20% (six schools) of the PLC group were identified based on MAP index scores in communication arts. The survey responses provided by the principals of the six schools were compared to the responses from the PLC group as a whole. This comparison was made in an effort to identify RtI characteristics that were more common in the top-performing schools that would account for the increase in MAP index scores.

The responses provided from the six bottom-performing schools were also compared to the PLC group results. This was done in order to identify the difference in RtI programs between top-performing schools and bottom-performing schools. This review showed that all of the top-performing schools had implemented RtI programs for more than three years. In comparison, 50% of the bottom-performing schools had implemented RtI programs for fewer than three years. This would indicate that over time school districts continue to provide RtI and modify the interventions to be better able to meet the academic needs of the students.

The analysis of survey responses also showed 66.7% of the top-performing schools provided RtI five days a week; however, five of the six schools only provided 70 minutes or less of time per week. In comparison to the bottom-performing schools, 50% allowed for more than 70 minutes each week for RtI. This indicates that the amount of time used for interventions is not as important as the focus on the mastery of learning objectives that takes place during the interventions. The analysis of survey responses

also revealed two-thirds of the top-performing schools identify students for RtI based on mastery of learning objectives.

Demographic data were also reviewed for the top-performing schools in an effort to identify any similarities among the demographics of the schools that have higher MAP index scores. A review of the demographics found the top-performing schools had a much higher student enrollment average compared to the average enrollment of the PLC group. The demographic review also showed the top-performing schools had a lower free and reduced price meals percentage compared to the PLC group average.

An analysis of the major elements and findings related to the study are reviewed and examined in Chapter Five. Based on the research questions that guided the study, conclusions are made relating to the overall study. Recommendations for future research are discussed to conclude the study.

Chapter Five: Summary and Conclusions

Academic interventions are not a new concept in education. They have gained momentum in education over the past 15 years with the signing of the No Child Left Behind Act (NCLB, 2002). The academic intervention design that has gained the most momentum is RtI, which became relevant within the IDEA of 2004 (United States Department of Education, 2007). The intention of RtI is to provide an alternative method of qualifying students for special education services beyond the discrepancy model (Brozo, 2009). At the elementary level it has been proven RtI helps students reach significant gains in academic achievement (Burns & Gibbons, 2013). However, the implications at the middle school level have disputed results (Sansosti et al., 2010).

Purpose Summary

The purpose of this study was to examine the Missouri Assessment Program (MAP) communication arts index scores of PLC middle schools that have implemented an RtI model and non-PLC middle schools that may not have implemented a systemic process of academic interventions. This was done by analyzing statistical differences in the two groups using three-year MAP index scores in communication arts for years 2012, 2013, and 2014. A review of the components of interventions in the PLC middle schools which achieve above the Missouri average in the area of communication arts was also conducted.

This study was designed to determine what characteristics of RtI programs, if any, were most common in the highest-performing PLC schools. A summary of the study, including findings, is discussed within this chapter. Conclusions to the study as well as the results to research questions are presented. This chapter concludes with the

implications relating to practice and recommendations for future research. Middle schools chosen for this study were in districts which had received PLC training through their regional RPDCs and had seventh- and eighth-grade students in their buildings. There were a total of 76 middle schools that met these criteria.

First, a survey was sent to all 76 middle school principals inviting them to participate in the study. A total of 30 middle school principals responded to the survey. Next, each of the 30 buildings' communication arts MAP scores were collected for the 2012, 2013, and 2014 assessments. Thirty non-PLC schools were then randomly chosen, and their 2012, 2013, and 2014 communication arts MAP scores were also collected. A *t*-test was then conducted to compare the two groups to determine if there was a significant difference in scores of PLC schools compared to non-PLC schools. After this was conducted, the survey results from the principals of the 30 participating PLC schools were analyzed. The six top-achieving PLC schools (top 20%) were identified, and their survey results were also analyzed. This analysis was done in order to identify characteristics of RtI programs in the top-performing schools.

Findings

A survey was created to identify two pieces of information. The first information gathered was to identify PLC schools that offer RtI during the school day. The next data gathered by the survey were the different characteristics that are present in the RtI programs of PLC schools. Building principals were selected because their districts received PLC training through the regional RPDCs. Based on the answers to the contingency questions, all participants in the study were building principals and agreed to participate voluntarily.

Selections were developed using multiple choice responses to the following questions:

- What is the name of your school district/building?
- How many students are enrolled in the school building?
- How many years has your school been a member of a Professional Learning Community?
- How many years has an intervention system been implemented?
- How many times per week does the intervention period meet?
- How many minutes per week are students in a structured intervention period?
- At what time is the structured intervention scheduled?
- Does the intervention program have a supplemental enrichment or privilege time component?
- How are students identified for intervention placement?
- How frequently are students rotated during Response to Intervention?
- Does the intervention program also address missing assignments?

The following research questions and hypothesis guided this study:

RQ1. What is the statistical difference between the Missouri Assessment Program (MAP) communication arts index scores of middle schools that have adopted the Professional Learning Community (PLC) model and have implemented a Response to Intervention (RtI) program and non-PLC schools that may not have implemented a systemic process of academic interventions, over a three-year period?

H₀: There is no statistical difference between the Missouri Program (MAP) communication arts index scores of middle schools that have adopted the Professional

Learning Community (PLC) model and have implemented a Response to Intervention (RtI) program and non-PLC schools that may not have implemented a systemic process of academic interventions, over a three-year period.

The principals' responses to the first question identified the PLC schools which agreed to participate in the study. The 2012, 2013, and 2014 communication arts MAP index scores were collected for these schools. The 2012, 2013, and 2014 communication arts MAP index scores were also collected for 30 randomly chosen non-PLC schools. One finding from the results was the three-year average of communication arts MAP index scores for the PLC schools was 357.85. The three-year average of communication arts MAP index scores for the non-PLC schools was 354.25. These data show that on average, the MAP index score in communication arts for the PLC group was 3.6 points higher than the MAP index score in communication arts for the non-PLC group during the three-year time span.

A *t*-test was then run to determine if there was a significant difference in MAP performance index scores for 2012, 2013, and 2014 between PLC schools and non-PLC schools. When using the 2012 MAP communication arts data, the *t*-test was calculated to find a *p*-value of .718. When using the 2013 MAP communication arts data, the *t*-test was calculated to find a *p*-value of .537. When using the 2014 MAP communication arts data, the *t*-test was calculated to find a *p*-value of .38. All three years that were included in the study resulted in a *p*-value greater than .05. Therefore, after running the *t*-test for each year, it was determined there is not a significant difference between the MAP scores of schools in the PLC group and schools in the non-PLC group.

As general education teachers are often the first responders who provide classroom interventions, they need to know how to set up a data collection plan that includes baseline, goal, and progress-monitoring (Wright, 2012). The lack of a significant difference in MAP index scores between PLC schools and non-PLC schools may be a result of the lack of assistance teachers receive with the multi-step process of setting up and implementing data collection tools in the RtI process, as described by Burns and Gibbons (2013).

The results also aligned with the findings of Sansosti et al. (2010), who argued while the elementary level is modifying classroom practices in the general and special education setting to support RtI, research authenticating the application of RtI within middle schools is limited. Allington (2011) also reiterated this claim saying there is essentially no research on RtI implementation at the middle school level.

RQ 2. What components of academic interventions are implemented in middle schools that have adopted the PLC model and achieved above the Missouri average on the MAP communication arts index scores over a three-year period?

In order to answer this question, the survey responses from the six top-performing PLC schools (top 20%) were analyzed and compared to the responses from all 30 principals of PLC schools. One characteristic that was identified to be present in the top-performing PLC schools was the number of years during which the school had provided RtI for the students. Of the top-performing schools, 83.3% of the schools had provided RtI to their students for three years or more. In comparison, of the bottom-performing PLC schools, 50% of those schools had provided RtI to their students for fewer than three

years. These data indicate the districts which have provided RtI to students for a longer period of time achieve better results on the MAP index scores in communication arts.

A second characteristic that was commonly present in top-performing PLC schools, when analyzing the survey results, was the number of days per week during which students received RtI. In the top-performing schools, 83.3% of the schools provided RtI to students a minimum of three days per week. Additionally, 66.7% of the schools provided RtI to the students all five days of the week. In comparison, only 36.7% of the remaining schools provided RtI to students all five days of the week. These data indicate the more frequently interventions are provided to students, the greater the increase in achievement on MAP index scores.

A third characteristic that was commonly present in top-performing PLC schools, when analyzing the survey results, was the total number of minutes per week during which students receive RtI. Of the top-performing PLC schools, 83.3% of the students received 70 minutes or less of academic intervention per week. In comparison, only 53.3% of the entire PLC group provided 70 minutes or less of RtI time to their students. More significantly, of the bottom-performing PLC schools, 60% provided greater than 70 minutes of RtI time to their students. These data indicate providing shorter, yet more direct interventions to students is more productive than an extended RtI session.

A fourth characteristic that was commonly present in top-performing PLC schools, when analyzing the survey results, is the identification and placement of students for RtI. Of the top-performing schools, 66.7% of the schools used mastery of learning objectives as the primary indicator for students who need RtI. This was consistent with the entire PLC group in which 63% of the schools used mastery of learning objectives as

the primary indicator for students who need RtI. However, none of the top-performing schools used student grades to indicate a student who needed to receive RtI. In comparison, 18.5% of the schools in the entire PLC group used student grades to identify a student who needed to receive RtI. These data indicate using student grades as the indicator for needing RtI is not as productive a method as is using mastery of learning objectives.

In addition to reviewing the survey results, a data analysis of the demographics of the six top-performing schools was done in comparison to the entire PLC group. After completing the analysis of demographics data, there were two demographics categories that were noticeable. First, the average enrollment of the top six schools was 683.5 students compared to the PLC group student enrollment average of 499.23. This is a difference in average student enrollment of 184.27 students. When looking at the enrollment of each individual school in the top six, all of the schools except one had an enrollment of 268 students or more. If you remove the smallest school from the group, the average student enrollment of the five remaining schools is 766.6 students. This average enrollment was 267.37 students higher than the average student enrollment of all the schools in the PLC group. Schools with a larger student enrollment tend to have higher MAP index scores in communication arts.

The second piece of demographic data that stood out when analyzing the six top-achieving PLC schools is the average free or reduced price meals percentage for these schools. The average free or reduced price meals percentage for the top six PLC schools was 39.1%, compared to the PLC group average free or reduced price meals percentage

of 57%. On average, the top six schools had a free or reduced price meals percentage which was 17.9% less than the PLC group average.

Of the six top-performing schools, only one had a free or reduced price meals percentage greater than the PLC group average, and that school's percentage was 67.6%. Three of the six top-performing schools had a free or reduced price meals percentage less than 35%, ranging from 34.3% down to 15.1%. If the school with the highest free or reduced percentage was removed, the average of the remaining five schools was 33.44%, which is 23.56% less than the average of the entire PLC group.

Further analysis of the free or reduced percentage data indicates the opposite holds true for PLC schools that fell below the state average on MAP index scores in communication arts. Of the 30 schools that made up the PLC group, 13 of the schools had a three-year MAP index average that fell below the state average of 359.5. The free or reduced price meals average of the 13 schools was 69.6%, which was 12.6% higher than the overall average for the entire PLC group. Of those 13 schools, only two had a free or reduced price meals average less than the PLC group average of 57%. Six of the schools had a free or reduced price meals percentage greater than 66%. These data may indicate schools with a lower percentage of students who qualify for free or reduced price meals tend to have a higher average MAP index scores in communication arts.

Conclusions

The *t*-test results indicated there was not a significant difference between the Missouri Assessment Program (MAP) communication arts index scores of middle schools that have adopted the Professional Learning Community (PLC) model and have implemented RtI and non-PLC middle schools that may not have implemented a systemic

process of academic interventions, over a three-year span. However, on average, schools which did provide RtI to students maintained a slightly higher average MAP index score.

There were some conclusions that could be drawn regarding the characteristics of RtI programs that were provided in the top-performing PLC schools. Those schools displayed the following characteristics:

- Response to intervention programs had been implemented for at least three years.
- Response to intervention programs were provided a minimum of three days per week, and in two-thirds of the cases RtI programs were provided daily.
- The percentage of schools providing a maximum of 70 minutes per week of RtI was 83.3%.
- None of the top-performing schools used grades to identify students who need academic interventions.

The characteristics of RtI programs which did not appear to have a significant impact on MAP index scores in communication arts included the following:

- The time of day in which the academic intervention met.
- Whether or not an enrichment program was provided to supplement the RtI program.
- The frequency with which students were rotated through RtI.
- Whether or not the academic intervention addressed missing homework.

Some conclusions could also be drawn when comparing the demographics of the top-performing PLC schools to the entire PLC group. The first conclusion that can be drawn, based on the analysis of demographic data, is that schools that score higher on the

MAP index score in communication arts on average have a higher student enrollment when compared to the entire PLC group. This may suggest schools with a larger enrollment also have a larger budget, providing the schools an opportunity for additional resources and teaching positions resulting in a more productive and focused academic intervention period.

The second conclusion that can be drawn, based on the analysis of demographic data, is that schools that score higher on the MAP index score in communication arts on average have a lower free or reduced price meals percentage when compared to the average of the entire PLC group. This would indicate the students within the top-performing districts reside in communities which consist of higher-income housing. This may suggest the students' families have fewer economic concerns at home and are better able to meet the daily needs of the students.

Implications for Practice

Researchers have explained essential components of academic interventions are related to raising student achievement at the elementary level (Burns & Gibbons, 2013). However, research, including the results in this study, supports the effectiveness of academic interventions weakens in the middle school level compared to the elementary level. A reason for this may be the structure of the daily schedule of a middle school compared to an elementary school.

In a middle school, students traditionally rotate from teacher to teacher as opposed to having the same teacher for multiple disciplinary areas at the elementary school. This may make it more challenging to adequately provide the students with the RtI needed in a prompt manner. Another reason for the lack of effectiveness in the

middle school setting may be the greater gaps in achievement that exist among middle school students (Burns & Gibbons, 2013).

Middle schools are often very quick to implement a program when it has proven to be effective at the elementary level (Allington, 2011). If the leaders of a middle school building choose to implement RtI, first staff must be well-trained in the implementation of RtI. Staff need to first have a mastery of the RtI design and have adequate resources, including time in the schedule, in order to implement RtI.

Prior to implementing RtI, staff also need to spend an extensive amount of time identifying the essential learner outcomes for courses and developing effective assessments which allow educators to quickly and effectively identify the students who are most in need of academic support. In order to effectively develop the essential learner outcomes and assessments, staff must be provided time in the schedule to be able to collaborate with colleagues. The time provided to collaborate must be ongoing and a normal expectation of the weekly work schedule.

Once staff have identified the essential learner outcomes and have developed effective assessments for identifying students who need academic support, building administrators need to then develop a bell schedule which allows for RtI on a daily basis. The interventions do not need to be an extensive period of time in the bell schedule. Instead they need to be a short intervention period in which the academic support is very focused on the essential learner outcomes of the daily lessons which are covered in the core content areas. Students need to be assigned to interventions in a timely manner based on the lack of mastery of learning objectives demonstrated on daily assessments provided in the classroom setting.

Recommendations for Future Research

The following are suggestions for future research which could be completed based on the results of this study. First, research needs to be conducted to analyze the steps taken by educators in top-performing schools to identify and develop the essential learner outcomes which are necessary in order to identify students who need additional academic support. By recognizing this process in the top-achieving schools, other districts can then follow the same blueprint in order for their staff members to effectively develop the essential learner outcomes which would then be used to drive the academic interventions provided to students.

Similarly, research needs to be done to analyze the steps taken by educators in top-performing schools to develop effective daily assessments which are then used to assess students' mastery of learner objectives. The students who fail to show mastery of learner objectives are then referred to RtI in a timely manner. Identifying the most effective daily assessments used in the top-performing schools will provide a blueprint for other districts to implement when developing daily assessments for their RtI process.

Another consideration is identifying the effects of RtI based on the size of the school determined by student enrollment. There is a great discrepancy in student population of middle schools throughout Missouri. Better analyzing the effectiveness of RtI based on the size of schools would be beneficial in identifying what interventions are effective based on student enrollment.

A final recommendation for future research would be to analyze RtI provided in middle schools which have free or reduced price meals percentages higher than the state average. An analysis of the demographics of the top-performing schools included in this

study showed the top-performing schools also had lower free or reduced price meals percentages. Identifying top-performing schools which also have a higher percentage of free or reduced price meals students would prove to be beneficial. Identifying the characteristics of RtI provided in these schools would allow schools to better ascertain what RtI programs improve student achievement for students from a lower socioeconomic background.

Summary

Response to intervention has not proven to be as effective at the middle school as at the elementary level (Brozo, 2009). Challenges at the middle school level which impact the effectiveness of RtI include curriculum requirements, larger gaps in the students' learning abilities, and the design of middle school schedules (Burns & Gibbons, 2013). Prior to 2004 and the reauthorization of the IDEA, a discrepancy model was used, and is still used, to identify students who needed special services (Allen, Banks, & Stoehr, 2011). Students who qualified for special services then had their needs met by working with specialized instructors in a resource room (Buffum et al., 2010). After the reauthorization of the IDEA in 2004, an RtI model was introduced as an alternate method used to meet the needs of students who qualified for special education (Burns & Gibbons, 2013).

The intention of the RtI design was to incorporate interventions throughout the student's academic day (Brown-Chisley & Steege, 2011). The interventions were specifically designed to assist the child in skillsets in which mastery of objectives was lacking (Wright, 2012). By providing the interventions to students, the students were better able to increase academic achievement and therefore avoid being placed in special

education (Ingalls et al., 2011). By intervening with students earlier in their academic careers, educators could better assist students in overcoming academic shortcomings instead of waiting for a discrepancy to be found between ability and academic achievement levels (Wright, 2012).

As the RtI approach became more common in the special education setting, research showed the model had success in helping special education students overcome their academic deficiencies (Buffum et al., 2010). Over time, elementary-level buildings began adopting the RtI model to implement with the entire elementary school population (Buffum et al., 2010). Research showed essential components of RtI can prove effective for raising student achievement at the elementary level (Burns & Gibbons, 2013). More recently middle level schools have begun to implement RtI designs. However, the effectiveness of the RtI model at the middle school level has had disputed results (Sansosti et al., 2010).

A quantitative study was conducted to examine the MAP index scores in communication arts. The index scores which were retrieved were from 2012, 2013, and 2014, and were from middle schools that have implemented RtI through the PLC process. The index scores from 2012, 2013, and 2014, were also retrieved from a random sampling of 30 non-PLC middle schools which may not have implemented a systemic process of academic interventions. The MAP index scores were used to determine if a statistical difference exists between schools which provide RtI developed using the PLC process compared to non-PLC schools which may not provide a systemic process academic interventions.

A review of the components of RtI being implemented in the top-achieving PLC middle schools was also conducted. This was completed in order to identify the response intervention characteristics that enhanced student achievement. Buildings selected to take part in the study had received PLC training through each school district's RPDC.

In Missouri, 259 schools had received PLC training through their regional RPDCs. Of the 259 schools which had received PLC training, 76 consisted of a building that contained seventh- and eighth-grade students. The building principals from each of these 76 schools received the request to complete the survey through an introductory email. The survey consisted of 11 questions which related to the characteristics of RtI provided in their schools. Of the 76 principals, 30 responded to the survey. The 30 districts that responded to the survey made up the PLC group for the study. Additionally, 30 school districts from Missouri were randomly chosen to make up the non-PLC group for the survey. The MAP index scores in communication arts for the 2012, 2013, and 2014 MAP assessments were collected for each of the 30 PLC schools and non-PLC schools included in the study.

A *t*-test was conducted to determine if there was a significant difference in MAP index scores for PLC schools when compared to the non-PLC schools. The results of the *t*-test indicated there was not a significant difference in the scores of PLC schools compared to the scores of the non-PLC schools. The top six (20%) schools in the PLC group were then identified based on the average MAP index scores in communication arts. The results from the surveys provided from the six building principals of the top-performing schools were then compared to the overall results from the surveys provided by the 30 PLC schools. This comparison was completed in order to determine if there

were any characteristics of RtI that were provided by the top-performing PLC schools which would justify the improved average MAP index scores.

Within the six buildings that were categorized as top-performing PLC schools, the characteristics of RtI found to be implemented included the following. Response to Intervention programs had been implemented for at least three years. Interventions were provided a minimum of three days per week, and in two-thirds of the cases they were provided daily. Five of the six schools only provided a maximum of 70 minutes of RtI per week. None of the top-performing schools used grades to identify students and instead focused on student mastery of learner objectives.

Some characteristics of RtI did not appear to have a significant impact on MAP index scores in communication arts. The time of day in which the RtI met did not significantly impact MAP index scores. Whether or not a school offered an enrichment program to supplement the RtI taking place did not significantly impact the scores. Neither did the frequency with which students were rotated through RtI, and whether or not the RtI addressed missing homework.

An analysis of demographic data was completed comparing the six top-performing PLC schools to the entire PLC group. The following demographic data were present in the top-performing PLC schools: the average enrollment of the top-performing PLC schools was 184.27 higher than the entire group, and the free or reduced price meals percentage was 17.9% lower than the entire group.

Appendix A

Survey Questions

The purpose of this survey is to identify elements of grades 6-12 academic intervention programs that positively impact student achievement on the Missouri Assessment Program. Questions are intended to identify the structure and format of intervention programs that are implemented in multiple school districts. The completion of the survey should take approximately five minutes of your time. Your responses are voluntary and will be confidential. Responses will not be identified by individual. If you choose to participate, completion of the survey constitutes your implied consent.

- 1) What is the name of your school district/building?
- 2) How many students are enrolled in the school building?
 - a. Less than 250
 - b. Less than 500
 - c. Less than 750
 - d. More than 750
- 3) How many years has your school been a member of a Professional Learning Community?
 - a.) 1
 - b.) 2
 - c.) 3 or more
- 4) How many years has an intervention system been implemented?
 - a) 1
 - b) 2
 - c) 3 or more
- 5) How many times per week does the intervention period meet?
 - a) 1-2 days per week
 - b) 3-4 days per week
 - c) 5 days per week

- 6) How many minutes per week are students in a structured intervention period?
 - a.) 45 minutes or less
 - b.) 45-70 minutes
 - c.) 70-95 minutes
 - d.) 95-120 minutes
 - e.) 120 minutes or more

- 7) At what time is the structured intervention scheduled?
 - a) Prior to first period
 - b) After last period
 - c) The structured intervention meets during the middle of the schedule

- 8) Does the intervention program have a supplemental enrichment or privilege time component?
 - a.) Yes
 - b.) No

- 9) How are students identified for intervention placement?
 - a.) Grades
 - b.) Mastery of Learner Objectives
 - c.) Other

- 10) How frequently are students rotated during Response to Intervention?
 - a.) Daily
 - b.) Weekly
 - c.) Bi-monthly
 - d.) Monthly

- 11) Does the intervention program also address missing assignments?
 - a.) Yes
 - b.) No

Appendix B

ATE: June 30, 2014

TO: Toby Kite

FROM: Lindenwood University Institutional Review Board

STUDY TITLE: [596940-1] The Correlation Between Academic Interventions and Academic Achievement

IRB REFERENCE #:

SUBMISSION TYPE: New Project

ACTION: APPROVED

APPROVAL DATE: June 30, 2014

EXPIRATION DATE: June 30, 2015

REVIEW TYPE: Expedited Review

Thank you for your submission of New Project materials for this research project. Lindenwood University Institutional Review Board has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

Approval is contingent upon the following conditions:

The concerns to human subjects are limited. With the application proposal, submit a copy of the Missouri PLC Director's letter to Missouri schools as documentation for the IRB's records.

In regards to the informed consent, provide qualification for the researchers (i.e. LU School of Education) for item #1. Also consider changing the word "safe location" to "secured location."

For the survey questions, the first question may identify the participant if a specific building is listed. As an alternative, simply list the district or remove the question. For question number 2, options b & c should include a range (i.e. 250-500 & 500-750).

This submission has received Expedited Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to the IRB.

This project has been determined to be a Minimal Risk project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the completion/amendment form for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of June 30, 2015.

Please note that all research records must be retained for a minimum of three years.

If you have any questions, please contact Robyne Elder at (314) 566-4884 or relder@lindenwood.edu. Please include your study title and reference number in all correspondence with this office.

If you have any questions, please send them to IRB@lindenwood.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Lindenwood

University Institutional Review Board's records.

Appendix C

Recruitment Letter

My name is Toby Kite and I am a doctoral student at Lindenwood University. Your school's name was given to me by your RPDC as a district that has received training in the Missouri Professional Learning Community Project. A PLC school provides a collaborative culture that focuses on the learning of all students by using data to make decisions. The four corollary questions that drive a PLC school are as follows:

1. What is it we expect students to learn?
2. How will we know that the students are not learning?
3. How do we respond when the students do not learn?
4. How do we respond when students have learned the material?

The purpose of this study is to identify characteristics of academic interventions that have a positive correlation on student achievement. If your building has implemented an academic intervention program into the schedule, this study applies to you. Would you be interested in taking an online survey of approximately 10 minutes? The questions are intended to identify characteristics of any academic intervention program that is being implemented in your building.

If you are willing to participate in the survey, please click the attached consent document which includes a link that will take you directly to the survey. Thank you for your time!

Respectfully,

Toby Kite

Appendix D

Adult Consent Form

LINDENWOOD

INFORMED CONSENT FOR PARTICIPATION IN RESEARCH ACTIVITIES

Academic Interventions and Academic Achievement

in the Middle School Grades

Principal Investigator Toby Kite

Telephone: XXXXXXXXXX E-mail: tkite@lindenwood.edu

Participant _____ Contact info _____

1. You are invited to participate in a research study conducted by Toby Kite, LU School of Education, under the guidance of Dr. Cathy Galland, LU School of Education. The purpose of this research is to determine if there is a correlation between academic interventions and student achievement on summative assessments.
2. Your participation will involve voluntary completion of a survey, which is hyperlinked to the bottom of this form.
3. The amount of time involved in your participation will be approximately 10 minutes for the online survey.
4. There are no anticipated risks associated with this research.
5. There are no direct benefits for you participating in this study. However, your participation will contribute to the knowledge about the benefits of academic interventions.
6. Your participation is voluntary and you may choose not to participate in this research study or to withdraw your consent at any time. You may choose not to answer any questions that you do not want to answer. You will NOT be penalized in any way should you choose not to participate or to withdraw.
7. We will do everything we can to protect your privacy. As part of this effort, your identity will not be revealed in any publication or presentation that may result from this study and the information collected will remain in the possession of the investigator in a secure location.

8. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Toby Kite, [REDACTED], or the Supervising Faculty, Dr. Cathy Galland, [REDACTED]. You may also ask questions of or state concerns regarding your participation to the Lindenwood Institutional Review Board (IRB) through contacting Dr. Jann Weitzel, Vice President for Academic Affairs at 636-949-4846.

I have read this consent form and have been given the opportunity to ask questions. I may retain a copy of this consent form for my records. I consent to my participation in the research described above.

By completing the survey, you consent to participate in this study.

Thank you for your time,

Toby Kite,

Doctoral Student

Lindenwood University

Please check here [Academic Interventions Data](#) to complete the survey.

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Vita

Toby Kite attended Southwest Missouri State University (now Missouri State University) and earned his bachelor's degree in secondary education with an emphasis in mathematics. He went on to earn his master's degree in education from Williams Woods University. He currently serves as a middle school principal in a suburban school located in southwest Missouri.

Prior to serving as middle school principal, Toby spent three years as an assistant principal in a 9-12 high school. Before entering administration, he spent seven years teaching mathematics at the secondary level. He has served students in the educational environment for a total of 16 years.