Effects of RTI on Missouri Assessment Program (MAP) Scores in Grade 5

By

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Abstract

The purpose of the study was to determine whether implementing RTI had an effect on MAP scores in grade 5. The information gained helped the administrator, PLC team, and all teachers improve their RTI program so that student achievement continued to increase.

Communication Arts and Mathematics scores from 2010, 2011, 2012, and 2013 collected and were separated into two groups: No RTI and RTI. Data was collected from the school district’s report card found on the DESE website (www.dese.mo.gov). These numbers were in percentage form, and were put into an Excel Spreadsheet. That data was then put into the ASP program to calculate a t-test.

The findings suggested that there is no difference in student achievement on the Missouri Assessment Program for mathematics or communication arts in grade 5 between students that participate in the RTI program and students who do not participate in the RTI program. It is recommended that the current intervention program be reviewed.
Introduction

Background, Issues and Concerns

A rural school district located in the Midwest, referred to as LES, was not seeing the improvement of student achievement, as measured by the MAP assessment, they desired on for grade 5 in both math and communication arts. There was no way to ensure that students who were not scoring in the proficient range were receiving the instruction and intervention for essential skills necessary to score in the proficient range. The administration and Professional Learning Community teams (PLC) of LES determined that a building-wide RTI would be the most successful way to help increase student achievement on standardized assessments, and implemented the program at the beginning of the 2010-2011 school year. The analysis of results in grade 5 will differentiate between student achievement on the MAP tests when the building has a building-wide RTI program and when it does not. One concern was that grade 5 had been departmentalized according to content area for the past five years and in 2012 changed to self-contained classrooms. There is no way for sure to know if this change will have an effect on MAP scores for the 2012-2013 academic year; however, all teachers on the grade 5 team were considered equally highly-effective teachers by the administration. Another concern was that in the 2011-2012 academic year new state standards were set into place. Teachers in grade 5 transitioned from GLE’s (Grade Level Expectations) to the CCSS (Common Core State Standards) in math and communication arts. The new standards, CCSS, required a more rigorous and relevant curriculum with in depth instruction of concepts. Stemming from this concern and transition in state standards, the MAP assessment given in the spring of 2013 was still assessing the GLE standards.
**Practice under Investigation**

The practice under investigation was how RTI affected student achievement on the Missouri Assessment Program (MAP Scores) in the Math and Communication Arts Sections in Grade 5.

**School Policy to be Informed by Study**

The administration and PLC of LES determined that a building-wide RTI would be the most successful way to help increase student achievement on standardized assessments, and implemented the program at the beginning of the 2010-2011 school year. All teachers were required to give assessments every two weeks to determine which students are not proficient in specific Communication Arts and Math skills. Those students were then sent to Tier 2 interventions with classroom teachers, as well as resource room teachers. At the end of each week, students’ progress was monitored to check for growth. If at the end of those two weeks the student was proficient, they were moved out of Tier 2 and back to Tier 1 in that skill. If they were not proficient, they remain in Tier 2 for another two weeks, this time receiving a different type of intervention. Then, if at the end of four weeks in Tier 2 a student was still not proficient, a review of that student’s progress was completed and they were put into Tier 3 until they were proficient.
Effect of RTI on MAP Scores 5

Conceptual Underpinning

Variables that are also important components to the RTI program include identifying variables of time, perseverance, aptitude, ability to understand instruction, and quality instruction. If students are not proficient following the normal Tier 1 instruction, more time is spent during Tier 2. These students have to show perseverance in continuing to become proficient at the skill, and the teachers also have to persevere, never giving up on their students, and continually trying new interventions to help. It is also of upmost important that students receive quality instruction in all tiers of RTI to ensure fidelity, a key aspect of RTI.

The No Child Left Behind Act (NCLB) of 2002 required that all students be at a proficient level in Communication Arts (CA) and Mathematics (MA) by 2014, as determined by their state’s standardized assessment method. Schools have felt the pressure to get all students to that proficient level and RTI was born out of that. RTI provides a way for schools to identify students that need some extra help to get proficient and then provides the time and staff resources to help those students. In addition, RTI helps schools to maintain fidelity and consistency in the intervention process and in theory, RTI will improve student achievement.

Statement of the Problem

Student achievement, as measured by the MAP tests, was not increasing as much as was desired. There was no way to ensure that students who were not scoring in the proficient range were receiving the instruction and intervention for essential skills necessary to score in the proficient range.
**Purpose of the study.**

The purpose of the study is to determine whether or not implementing RTI (Response To Intervention) had an effect on MAP (Missouri Assessment Programs) scores in grade 5.

**Research questions.**

**RQ 1:** Is there a difference in student achievement on the Missouri Assessment Program (MAP) Communication Arts section in grade 5 between students that participate in the RTI program and students who do not?

**RQ 2:** Is there a difference in student achievement on the Missouri Assessment Program (MAP) Mathematics section in grade 5 between students that participate in the RTI program and students who do not?

**Null hypotheses.**

Ho: There is no difference in student achievement on the Missouri Assessment Program (MAP) Communication Arts section in grade 5 between students that participate in the RTI program and students who do not.

Ho 2: There is no difference in student achievement on the Missouri Assessment Program (MAP) Mathematics section in grade 5 between students that participate in the RTI program and students who do not participate in the RTI program.
**Anticipated benefits of the study.**

The results of this study will help administrators and teachers know if the current RTI program in their school is successful and helped to improve student achievement as measured on the Communication Arts and Mathematics portion of the MAP (Missouri Assessment Program). As a result of this study, a PDSA (Plan Do Study Act) chart can be analyzed and evaluated to help set and achieve goals set by the district to improve student achievement.

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**Definition of Terms**

MAP: Missouri Assessment Program – the state wide assessment that serves as the measurement for No Child Left Behind criteria

DESE: Missouri Department of Secondary and Elementary Education – the administrative part of the Missouri State Board of Education and works to maintain a strong public education system in that state

IDEA: Individuals with Disabilities Education Act -A federal law determining how states and public agencies provide intervention, special education, and related services to children with disabilities.

RTI: Response to Intervention which consist of high quality instruction, assessment, and research-based interventions

NCLB: No Child Left Behind Act of 2001 which set standards and established measurable goals for all public schools to meet in order to receive federal funding

PLC: Professional Learning Communities – teachers and administrators from a school that meet to seek and maintain learning and act on that learning
MAP CA: Missouri Assessment Program Communication Arts - the state wide assessment that serves as the measurement for No Child Left Behind criteria in the areas of Reading and Language Arts

MAP MA: Missouri Assessment Program Mathematics - the state wide assessment that serves as the measurement for No Child Left Behind criteria in the area of Mathematics

Mule Time: LES’ name for their RTI program

Specials teachers: Art, Music, Physical Education and Computer teachers

Summary

LES is a Midwestern rural elementary school in a district that has one elementary school, one middle school and one high school. The district has adopted a school calendar that implements the four day week for students. The students attend school Tuesday through Friday for 450 minutes per day. One Monday a month PLC teams meet to review data and make instructional decisions for instruction in Tier I, II and III. The school practices RTI, with a building-wide RTI for the first 25 minutes of each school day, utilizing classroom teachers, specials teachers, Special Education staff, Speech Pathologists, as well as paraprofessionals. This research investigates the difference in student achievement as measured by the MAP before and after the RTI program was implemented for grade 5.
Review of Literature

Response to Intervention or RTI was established after educators agreed that there needed to be another method in determining qualifications for special education. Since students were placed in special education solely based on the discrepancy method, this left many students who were not qualifying for special education; however, they were not progressing at the pace of other students in the regular classrooms. The regular classroom teachers would become frustrated as would the special education teachers both recognizing a need for the student at-risk of failing. RTI was then developed to help these students with the skills not mastered which then helped teachers with recording data on these specific students. The data was analyzed as a new way to think about both disability identification and early intervention assistance for at-risk students. “RTI promises to change the way schools support students with learning and behavior problems by systematically delivering a range of interventions based on demonstrated levels of need.” (Ideas that work, p. 2) Although all states address the general aspects of a learning disability as defined by IDEA (Individuals with Disabilities Education Act), each state is given the responsibility to establish its own criteria for eligibility for special education services.

Before determining if a student qualifies for special education by using RTI, a collaborative team of teachers (PLC-professional learning communities) needs to establish a focus on learning, to establish a collaborative culture, and then to establish a focus on results. RTI is built up in two parts: effective interventions and a systematic response. The characteristics of effective interventions includes: urgent, research based, timely directive, and targeted. The systematic response includes five major areas: identify, determine, monitor, revise, and extend (Buffman, Mattos, & Weber, 2009).
High-quality instruction and intervention is the implementation of core instruction and interventions that are scientifically researched to produce results in student learning.

RTI is made up of three tiers of instruction. Tier I is the instruction that all students receive in the regular classroom setting. This tier meets the needs of at least 75% of the students. The first step in an intervention program is to make sure that Tier I instruction is meeting the needs of those 75% of the students. If more than 25% of the students need intervention, then Tier I instruction must be looked at and changes made. Tier II is the supplemental instruction that is to meet the instructional needs of at least 15% of the students. Tier III is for those students that need intense instruction in a subject area, and have not made progress in Tiers I and II. Tier III focuses on the needs of each individual student (Buffman, Mattos, & Weber, 2009).

![Pyramid of RTI Support](image)

*Figure 1.1 Pyramid of RTI Support* (Johnson, 2012)

The success of a multi-tier system of supports (MTSS) is dependent upon accurate decisions made at all tiers of the framework. Tier 2 decisions at the building level are critical
and complex. Schools need the right interventions in place, the interventions must be intensive enough to accelerate student learning, and each intervention must be implemented with fidelity. When the educators have determined which students qualify for tier 2 (usually by analyzing the data from a grade-wide common assessment over a specific skill), the intervention team then matches the students to interventions. Next, the interventionists continue to monitor student progress and manage interventions. Continuing with the process, educators track intervention effectiveness. “The last critical decision point within Tier 2 is gathering information on the effectiveness of Tier 2 interventions as a whole, in addition to individual student progress. If an intervention is not producing positive effects, schools should examine the integrity of the implementation of the intervention as well as the match to student need.” (Metcalf, 2013, p.3) If the data from progress monitoring shows that a student is not showing progress compared to the other students in Tier 2 receiving the same intervention, then the intervention team will decide on whether or not to place the student into Tier 3.

At Tier 3, an additional layer of intensive supports is available to address the needs of a smaller percentage of students who are experiencing problems and are at risk of developing more severe problems. At Tier 3, the goal is remediation of existing problems and prevention of more severe problems or the development of secondary concerns as a result of persistent problems. For example, “At Tier 3, a student whose reading performance falls significantly below that of his or her peers, despite intervention, might receive intensive reading support from the learning assistant four times per week with close monitoring of his or her progress.” (Ervin, 2013, p. 2) There are many reasons that students may not achieve at a high level. Those reasons may include the lack of prior skills, additional time is needed, Tier I teaching does not meet their instructional needs and lack of effort on the part of the student. Therefore, the type of
intervention needs to be targeted to each individual student. The reason why they are not achieving must be identified, not just the fact that they are not achieving. (Buffman, Mattos, & Weber, 2009)

In order for students to increase achievement on standardized assessments, targeted instruction with frequent progress monitoring is needed. Students’ instructional needs will be met on a daily basis and more success will be seen. Giving teachers the support that they need to meet their students’ instructional needs is also a necessary component of the Response to Intervention Program. A building wide RTI program with everyone on board is imperative to the improvement of student achievement. (Buffman, Mattos, & Weber, 2009)
Research Methods

Research Design

A study was designed to collect data and compare student achievement before and after the implementation of RTI.

The independent variable was whether or not RTI had been implemented in grade 5. The test measured the results of the dependent variables, student achievement as measured by the MAP test.

Study Group Description

The study group for this research consists of the total amount of students in grade 5 at LES from 2010 to 2013. There were ten classroom teachers and four other staff members who participated in the intervention instruction of these students. The enrollment for kindergarten through 5th grade from 2010 to 2013 had increased every year beginning with 394 students in 2010 to 458 students in 2013. In 2010, the ethnic population of the elementary was .3% Asian, 2.8% Black, 1.5% Hispanic, .3% Indian, and 95.20% White. In 2011, .5% were Asian, 1.3% Black, 1.5% Hispanic, .8% Indian, and 95.90% were White. In 2012, the percentage of Asians remained the same, 2.10% were Black, 1.60% Hispanic, 1.9% Indian, and 93.9% were White. In 2013, there were .2% Asian, 1.5% Black, 2% Hispanic, 1.3% Indian, and 95% were White. Attendance at LES had also increased from 94.9% in 2010 to 96.1% in 2013. As for students eligible for free or reduced-price lunch, LES had 34.9% in 2010 and experienced
an increase with their enrollment every year resulting in 46.1% eligible in 2013. The total years of professional experience of the grade 5 teachers at LES were 30 years.

Data Collection and Instrumentation

Data was collected from the school district’s report card found on the DESE website (www.dese.mo.gov). Communication Arts and Mathematics scores from 2010, 2011, 2012, and 2013 was collected and separated into two groups: Proficient/Advanced and Basic/Below Basic. These numbers were in percentage form, and were put into an Excel Spreadsheet. That data was then put into the ASP program to calculate a t-test.

Statistical Analysis Methods

A Statistical Package (ASP) software was used to complete the statistical calculations in this study. Descriptive statistics and a t-test were calculated. Microsoft Excel was also used to compile some totals used in the research.
Findings

As seen in Table 1, data was found on dese.mo.gov for percentage of students that scored proficient or advanced on the Mathematics portion of the Missouri Assessment Program in 2010, 2011, 2012, and 2013. After that data was collected, it was put into a t-chart. The results of which can be found in Table 2.

Table 1: Percent of Students Scoring Proficient/Advanced on the Missouri Assessment Program-Mathematics

<table>
<thead>
<tr>
<th>Source</th>
<th>Mean</th>
<th>Mean D</th>
<th>t-test</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No RTI (2010)</td>
<td>55.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RTI (2011)</td>
<td>62.90</td>
<td>-2.5</td>
<td>-0.353412</td>
<td>2</td>
<td>0.757556</td>
</tr>
<tr>
<td>RTI (2012)</td>
<td>60.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RTI (2013)</td>
<td>51.2</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Note: Significant when p<=0.25

The null hypothesis states that there is no difference in student achievement on the Missouri Assessment Program (MAP) Mathematics section in grade 5 between students that participate in the RTI program and students who do not participate in the RTI program. Without RTI in place in grade 5, 55.60% was the percentage of students in 5th grade that scored proficient or advanced on the Mathematics portion on the MAP test. The first year that LES had an RTI program in place, the percentage of students in grade 5 that scored proficient or advanced was
62.90%. In the second year (2012), the percentage of students in grade 5 that scored proficient or advanced was 60.2%, and in the third year of RTI (2013), the percentage of students in grade 5 that scored proficient or advanced was 51.2%. The difference between the percentages from 2010 to 2011 was 7.3. The difference between the percentages from 2011 to 2012 was 2.7, and the difference between the percentages from 2012 to 2013 was 9. The t-test value was -0.353412. For this test, an alpha level of .25 was used. The p-value found was 0.757556. Since the p-value was not less than the alpha level, the null hypothesis was not rejected. Therefore, there is no difference in student achievement on the Missouri Assessment Program (MAP) Mathematics section in grade 5 between students that participate in the RTI program and students who do not participate in the RTI program.

As seen in Table 3, data was found on dese.mo.gov for percentage of students that scored proficient or advanced on the Communication Arts portion of the Missouri Assessment Program in 2010, 2011, 2012, and 2013. The percentage of students scoring in that range was then found for all four years. After that data was collected, it was put into a t-chart. The results of which can be found in Table 4.

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>58.70%</td>
<td>64.50%</td>
<td>57.70%</td>
<td>53.6%</td>
<td></td>
</tr>
</tbody>
</table>
t-test Analysis

Table 4: t-test Analysis Results for Grade 5 RTI and Missouri Assessment Program (MAP) Communication Arts Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>Mean</th>
<th>Mean D</th>
<th>t-test</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No RTI</td>
<td>58.70</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RTI</td>
<td>58.60</td>
<td>0.1</td>
<td>0.0157303</td>
<td>2</td>
<td>0.988878</td>
</tr>
</tbody>
</table>

Note: Significant when p<=0.25

The null hypothesis states that there is no difference in student achievement on the Missouri Assessment Program (MAP) Communication Arts section in grade 5 between students that participate in the RTI program and students who do not. Without RTI in place in grade 5, 58.70% was the percentage of students in 5th grade that scored proficient or advanced on the Communication Arts portion on the MAP test. The first year that LES had an RTI program in place, the percentage of students in grade 5 that scored proficient or advanced was 64.50%. In the second year (2012), the percentage of students in grade 5 that scored proficient or advanced was 57.7%, and in the third year of RTI (2013), the percentage of students in grade 5 that scored proficient or advanced was 53.6%. The difference between the percentages from 2010 to 2011 was 5.8. The difference between the percentages from 2011 to 2012 was 6.8, and the difference between the percentages from 2012 to 2013 was 4.1. The t-test value was 0.0157303. For this test, an alpha level of .25 was used. The p-value found was 0.988878. Since the p-value was not less than the alpha level, the null hypothesis was not rejected. Therefore, there is no difference in student achievement on the Missouri Assessment Program (MAP) Communication Arts
section in grade 5 between students that participate in the RTI program and students who do not participate in the RTI program.
Conclusion and Recommendations

The null hypothesis stated that there is no difference in student achievement on both of the Missouri Assessment Program (MAP) Communication Arts and Mathematics sections in grade 5 between students that participate in the RTI program and students who do not. The results of this study indicate that the RTI program utilized by LES did not affect scores on the MAP in the areas of Communication Arts and Mathematics. LES did show to have higher mean scores during the academic schools of implementing RTI; however, this difference was no statistically significant.

The t-test results showing that RTI did not have an effect on MAP scores demonstrates that either too many other issues with implementing the program was the problem or a significant change in improving the RTI program was necessary. The RTI program does continue to identify students who do not score proficient in specific skills, therefore, placing them in tier 2 for intervention instruction. However, a concept that needs to be taken into consideration is the time spent in tier 2 on the skill not mastered and the amount of resources and professional development provided for teachers to become quality intervention teachers.

Before implementing change to the RTI program, it would be necessary for administrators to evaluate whether or not their teachers are highly qualified teachers. There may be some areas of concerns where the quality of instruction given by intervention teachers is adequate for the students. After evaluating the intervention staff, administrators would need to provide appropriate professional development for the teachers. Professional development would need to be ongoing, so teachers could generate a pool of effective strategies used in intervention. Another area of concern is the amount of time spent on RTI strategies for a specific skill as well as the number of days used to adequately help the student master the skill. After these changes
are made, though, the administrator will need to continuously monitor student progress and make changes where needed.

Curriculum and instruction is another area that would need to be closely monitored by administration. Teachers would need to collaborate together with the administrator to make sure the appropriate assessment is given and that effective instruction was planned and in place with all necessary materials and resources. Assessments should be between 8-10 questions over one skill in communication arts and one skill in mathematics. The assessment should be given two more times to tier 2 students and data should be recorded each time the test is given in order to track progress for the individual students. Instruction should be researched based strategies and there should be more than one strategy used to help the student master the skill.

Instruction needs to be specific to mastering foundational skills before requiring a student to master a skill before they have the foundational skill mastered that is needed to complete the task. Intervention needs to be individual for every tier 2 student; therefore, even after students have been assessed to qualify for tier 2, more assessment needs to occur to determine the specific skill that was needed to be mastered for scaffolding to occur. The PLC team and administration needs to meet and look at all the essential concepts for each grade level and determine the prerequisite skills for those essential concepts. Collaboration needs to be an ongoing process among the grade level teachers, PLC, and administration.

Collaboration also needs to extend to writing reading improvement plans and math improvement plans. At LES, reading is considered the higher priority over mathematics; however, bringing attention to writing individual math improvement plans for students qualifying for tier 2 would be beneficial for the intervention teacher to use as a resource.
especially since the intervention teacher may not be the student’s regular classroom teacher. PLC committees would need to collaborate to discuss the criteria for a math improvement plans. As for reading, LES already uses reading improvement plans and has specific criteria in place on how to write one and on how to qualify for one. Another possible solution that would also help with the improvement plans is the addition of hiring an instructional coach. Regular classroom teachers have expressed in a survey at LES that they do not have enough knowledge on several different strategies to use with being intervention teachers. An instructional coach would be a huge asset to the staff with helping improvement in instruction.

Finally, a survey should be created by the PLC team annually and sent to all staff members to help improve the intervention process, and RTI data analysis team needs to be created to spend more time doing a thorough analysis of common assessments and checking on progress monitoring. All of the above mentioned recommendations could be organized by having an RTI coordinator. There are many avenues that still need to be worked out with RTI being new at LES; however, having continual data analysis and collaboration occurring among the teachers will make the RTI program more effective.
References

Batsche, B. (2011). *Rti action network; a program of the national center for learning disabilities.* Retrieved October 20, 2013, from Rtinetwork:
http://rtinetwork.org/getstarted/evaluate/refiningimplementation


